



Annual Report 2022

Acknowledgements

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Annual report 2022

Delft University of Technology

22 May 2023

The financial statements in this annual report are a print of the original annual financial reporting, including the financial statements pursuant to Section 2:361 of the Dutch Civil Code. These financial statements are an English translation of the financial statements adopted on 22 May 2023. In case of any discrepancies between the English translation and the financial statements adopted on 22 May 2023, the latter prevail. The original financial statements can be obtained at the TU Delft website under Annual reports in section Facts and Figures.

Preface

The start of 2022 was marked by festivities. We used our 180th anniversary as an opportunity to boost our energy research in several ways under the motto 'Speeding up the energy transition'. During Dies Natalis (Foundation Day) on 14 January, we opened the 24/7 Energy Lab, where we are testing a local climate-neutral energy system for the built environment. Later in the year, we opened the Control Room of the Future. Here, we are exploring how new energy technologies can be integrated into a smart electricity grid. We have continued to strengthen our position with two dedicated wind energy research laboratories, one of which is on floating wind turbines. Meanwhile, we have also been working to make the campus itself more sustainable: in May, we opened our first energy-generating education building – Echo.

That campus is where it all happens. As soon as the easing of the COVID-19 measures allowed, we thus encouraged our staff and students to return to campus as much as possible. After all, research, education and innovation all benefit from encounters and interpersonal contacts, whether planned or by chance. And we were delighted to welcome prospective students back to campus for the first time in the autumn. They came in large numbers, some of them probably to make up for lost time.

Not only did potential students catch up with the re-opening of the campus, but the number of potential patentable inventions by scientists increased to over 100. Our intellectual property (IP) is the foundation of much of the activity on the TU Delft campus. Some 275 businesses, ranging from start-ups to renowned technology companies, are now based here. Some of the start-ups have since moved to the newly completed scale-up building Delft NEXT. In total, all these businesses employ around 5,000 FTEs. Together with our researchers and stakeholders, they shape our mission: creating impact for a better society.

Our university is by all means a miniature society. That should be the start of making an impact on a wider society. We are committed to providing a diverse and inclusive work and study environment – one in which everyone feels welcome and safe. We addressed this last year by appointing faculty diversity officers and teams alongside the central Diversity & Inclusion (D&I) Office. Together, they are instrumental in raising awareness of D&I across the organisation and embedding it in its processes. For example, we have made Gendered and Inclusive Research and Innovation (GIRI) a strategic priority. We have committed to using more inclusive language in our job advertisements, for example, and we have created additional reflection rooms and all-gender toilets. In relation to social safety, we have strengthened the trust network, including by introducing two ombudsmen and training confidential advisers in the student associations.

Even so, the mental well-being of our students and doctoral candidates remains a priority. Young people have suffered disproportionately in recent years. Because of the COVID-19 restrictions, they were deprived of a significant part of their education. And even as new crises emerge, it is young people who are at the back of the queue again in the housing market, for example. Meanwhile they, in particular our aspiring engineers, are implicitly expected to soon be leading the way in solving society's problems. TU Delft is trying to provide adequate guidance to its students by doubling the number of university psychologists.

In our miniature society working for a better society, 'together' is obviously a key word. Co-operation underpins our success in research and innovation. This includes our esteemed partners 4TU, Convergence and LDE, as well as the broad Dutch academic community united in UNL, and internationally with our partners in ENHANCE, IDEA League and CESAER, among others. In 2022, we continued to work in our TU Delft Campus ecosystem with social partners and businesses, turning research results into specific solutions. A special mention goes to our home city of Delft, our partner in all kinds of projects and home to many students and colleagues. And in our commitment to a better society, our Supervisory Board (SB) provides unwavering assistance and advice.

Finally, you will read more about our education, research and innovation in this annual report. For us, TU Delft's popularity among prospective students and its high position in international rankings reflect a very positive year. The tremendous efforts of our unparalleled academic and support staff have made this possible, and we are extremely grateful to all of them.

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Supervisory Board Report

While 2021 was still completely dominated by the COVID-19 pandemic, 2022 saw a gradual return to normal life in society, including at the university. The university has largely been able to function as it did before the pandemic. The Supervisory Board was able to hold all meetings on campus again and make the highly valued visits to faculties and facilities.

The Supervisory Board reports below on its activities relating to its supervisory role in 2022.

Vision and strategy

In late 2017, the Supervisory Board approved the new strategic plan for the 2018–2024 period, ‘Impact for a better society, TU Delft Strategic Framework 2018–2024’. The strategic priorities for the final years of the Strategic Framework were fleshed out in 2021 and the Supervisory Board was involved in this process. At its meeting of 25 April 2022, the Supervisory Board approved these strategic priorities for the 2022–2024 period. Preparations for the 2024–2030 strategic exploration, Profile and Size, began in early 2022. This exploration has led to the Contours2030 strategy project, which explores the potential for growth at a multi-campus university. The Supervisory Board is and will be involved in this project at appropriate times.

Strategic co-operation

TU Delft works with the three other universities of technology in the 4TU. Federation. Regionally, TU Delft has been working for some time with Leiden University and Erasmus University Rotterdam, in the so-called LDE alliance. Forms of co-operation such as these occur on the basis of Joint Regulations that the Supervisory Board has approved. TU Delft also co-operates with other universities and Academic Medical Centres in HollandPTC and the Institute for Advanced Metropolitan Solutions.

Exploring further co-operation with the Erasmus Medical Centre and Erasmus University Rotterdam also started in 2018 and led to the Convergence Alliance. The partners (TU Delft, Erasmus MC, Erasmus University Rotterdam and, in the case of AI, also Leiden University) have started in different configurations with the defined convergence themes:

- AI, Data & Digitalisation
- Health & Technology
- Resilient Delta Rotterdam
- Pandemic & Disaster Preparedness
- Healthy Start

To this end, the Supervisory Board maintains close contact with the Executive Board and the partners' Supervisory Boards. The directors of the themes regularly give presentations on the progress in their programmes. The chair of the Supervisory Board is a member of the Convergence Supervisory Board.

The chairs of all Supervisory Boards of universities in the Netherlands meet twice a year to discuss national developments relating to the regulation of higher education. The Minister of Education, Culture and Science attends one of these meetings each year.

Education and research

The Supervisory Board is actively involved in developments in the field of education. Matters such as new degree programmes, the relocation of degree programmes, the possible introduction of a cap on student intake (*numerus fixus*) for certain programmes, intake management scenarios and quality-assurance policy are discussed with the Supervisory Board before they are implemented, both in regular meetings and strategy meetings with the Executive Board.

Accreditation and re-accreditation processes for the degree programmes and research assessments are also regularly discussed with the Supervisory Board twice a year.

Preparation for both the strategic developments in education and research and the ensuing activities takes place in the Board's Education and Research Quality Assurance Committee (cKOO). The Quality Agreements and their progress are also discussed in the cKOO. The chair of the cKOO reports on this to the full Supervisory Board. Knowledge Safety is a permanent item on the agendas of the cKOO and Supervisory Board.

The full Supervisory Board is informed about TU Delft's strategy and developments regarding online education and the Extension School.

Campus and real estate

Each quarter, TU Delft's real-estate matters are discussed first in the Audit Committee meeting, followed by the meeting of the full Supervisory Board, and further decisions are made in the form of approval, if necessary. The Supervisory Board pays close attention to the preparations for updating the campus strategy and its financing. Examples of real-estate topics that received the Supervisory Board's approval in 2022, besides the update of the 2022 Campus Strategy, are the thermal energy storage and infrastructure in the Kluiver area and the new QuTech building.

In 2022, the Supervisory Board paid ample attention to market conditions in relation to the campus strategy investment programme. Unpredictable market developments, caused by the global COVID-19 pandemic, economic developments, the war in Ukraine that started in February 2022 and the resultant sanctions against Russia, have affected the implementation of TU Delft's campus strategy investment programme. Costs are rising sharply, while labour and materials are in short supply. Affordability and financeability are subject to an annual internal review as part of updating the campus strategy. KPMG also assessed this externally in 2022.

Other campus-related topics discussed in 2022 included the tram line across campus and geothermal energy. The Supervisory Board also approved the plan to expand TU Delft locations in The Hague.

Administration and management

The Supervisory Board held four regular meetings with the Executive Board and met several times without the Executive Board in 2022. Two strategy meetings were also held, during which several strategic issues for TU Delft were discussed in detail with the Executive Board and subject experts. Examples include Knowledge Security, Sustainability, Educational Innovations and exploring the strategy for the university as a whole for the coming years.

Political developments and developments in national funding are also discussed at these meetings.

The Supervisory Board has three committees: the Remuneration and Appointments Committee, the Audit Committee (AC), and the Education and Research Quality Assurance Committee (cKOO). The Audit Committee met four times in 2022, and the cKOO twice. The members of the Remuneration and Appointments Committee (chair and vice-chair of the Supervisory Board) have been in regular contact on an individual basis regarding appointments and appraisals of the Executive Board.

Supervisory Boards must also monitor the administration's compliance with laws and regulations. To enable the Supervisory Board to perform this supervisory task properly, subjects including actual or anticipated amendments to the law, activities and opinions in the field of academic integrity, the Code of Ethics, Safety and Security, risk management, and information security are discussed with the Board on a regular basis.

The topic of ancillary activities received special attention in 2022. The topic is a standard item on the Audit Committee's agenda. Besides the Sectoral Ancillary Activities Regulations for Dutch Universities (part of the Collective Labour Agreement of Dutch Universities), TU Delft has adopted new implementation rules. The Supervisory Board has asked the Executive Board to adopt a zero-tolerance policy to complying with these rules.

The Supervisory Board also discusses the topic of social safety as a result of the confidential advisers' annual report and is briefed on Integrity and Diversity & Inclusion. With the arrival of a new Staff Ombudsman and a Student Ombudsman in 2021, it was agreed that they would report annually and that these annual reports would be widely discussed and published.

The Staff Ombudsman Regulations were adopted in 2022. The chair of the Supervisory Board has been given a role in these regulations in case the Ombudsman is discharged from the position. The request to involve the Supervisory Board in such a situation came from the Works Council.

At the end of December 2022, the Supervisory Board was informed about an investigation launched by the Education Inspectorate at TU Delft.

Twice a year, the Supervisory Board discusses an overview of current legislative developments relating to higher education and scientific research.

An overview of activities is also compiled for the Supervisory Board every quarter. This overview contains notable achievements, subjects and developments relating to all organisational units, faculties and departments.

Finances and operational management

Audit Committee

The Audit Committee oversees the efficient use of central government funds. Important agenda items discussed in the AC, besides the Annual Report, Financial Statements and the Budget, include major investment projects (primarily in real estate), as well as the funding of these investments. Further items discussed are the quarterly financial and other reports, the audit annual plan, the planning and results of Internal Audit's activities, and of course the financial reports on results and cash flow.

The discussion of the 2021 audit report was also on the agenda in April. On 9 December 2022, the 2022 management letter and resultant improvement actions, and the 2023 Budget were on the agenda. The 2021 audit report and the 2022 management letter were discussed in the presence of the external auditor, EY.

Supervisory Board

In its meeting on 25 April 2022, the Supervisory Board approved the 2021 Annual Report and the Financial Statements; in its meeting on 19 December 2022, the Board approved the Budget for 2023. In all its meetings, the Board focused much of its attention on TU Delft's financial position, prepared by the Audit Committee (see above). At each meeting, Finance presented a controller letter/quarterly report showing TU Delft's results for the past quarter and CRE presented a report on real estate progress for the past quarter.

The Supervisory Board concludes that TU Delft's financial position is sound, its control is in order, and its resources are used efficiently.

Employee participation

The Higher Education and Research Act (WHW) includes an independent right of direct consultation between the employee representative body and the Supervisory Board, the right to nominate one of the Board members and advisory powers in respect of the Board members' profiles. The Supervisory Board and the employee representative bodies have made procedural arrangements concerning these matters. The member who in particular has the confidence of representative bodies, drs. Carolien Gehrels, consults with the chairs of the Works Council (WC) and Student Council (SC) before each Supervisory Board meeting. She also attends WC and SC meetings several times a year, including twice a year on the subject of the 'General state of affairs'. In addition, the SB member is always available for the employee representative body.

Personnel and internal affairs

In 2022, the Supervisory Board comprised:

- Ir T.J.G. Collot d'Escury, chair, managing partner of Roland Berger BV (appointed until 1 July 2025, first term)
- Prof. L.L.G. Soete, vice-chair, former Rector Magnificus of Maastricht University (appointed until 1 May 2025, second term)
- Drs. C.G. Gehrels, member who in particular has the confidence of representative bodies, Global Director of Energy Transition at Arcadis (appointed until 1 June 2023, second term)
- Drs G. de Zoeten, register controller, Financial Director of Inchcape PLC (appointed until 1 December 2022)
- Ir H.L. Wachters, partner at Eden McCallum (appointed until 1 January 2025, first term)
- Vacancy (as at 1 December 2022)

Gijsbert de Zoeten resigned as a member of the TU Delft Supervisory Board from 1 December 2022 for personal reasons. The Board is most grateful for his contribution, dedication and subject knowledge with which he served TU Delft over the past six years. The Board has started the process for his succession.

On 14 February 2022, the Supervisory Board reappointed Vice Rector Magnificus/Vice President of Education Prof. Rob Mudde for the period from 1 March 2022 to 1 March 2026.

The Remuneration Committee again conducted annual appraisal interviews with the individual members of the Executive Board in 2022.

Under Article 4 of the TU Delft Supervisory Board Regulations, the Board is responsible for determining the quality of its own performance. To this end, each year the Supervisory Board discusses its own performance as well as that of the individual members, and the follow-up action required, without the Executive Board being present. The Supervisory Board also evaluated its chair under the supervision of the vice-chair. The self-evaluation for 2021 was completed in April 2022 based on a questionnaire that all members completed beforehand. The evaluation for 2022 will be completed in May 2023.

Conclusion

TU Delft's remuneration policy for administrators and supervisors is in line with the Senior Executives in the Public and Semi-Public Sector (Standards for Remuneration) Act (WNT) and with the agreements with the Ministry of Education, Culture and Science. The Supervisory Board also respected the principle of independence in 2022.

Lastly, the Supervisory Board thanks TU Delft and its administrators for their constructive cooperation.

Key indicators

Education

Intake of Bachelor's students

2022: **3,539**
2021: 3,684



Intake of Master's students

2022: **1,725**
2021: 1,983

Intake into the bridging programme

2022: **270**
2021: 309

Total number of Bachelor's students

2022: **13,781**
2021: 13,947



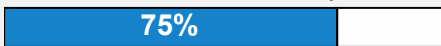
Total number of Master's students

2022: **12,876**
2021: 13,029

Total number of students in the bridging programme

2021: **751**
2022: 733

Positive Binding Recommendation on Continuation of Studies in the 1st year



Bachelor's degrees

2021: **2,785**
2020: 2,832



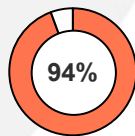
Master's degrees

2021: **3,805**
2020: 3,983

Research

Number of peer reviewed publications

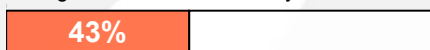
2022: **4,900**
2021: 5,052



Of which Open Access publications

2022: **4,625**
2021: 4,041

PhD graduation rate within 5 years



EngD degrees

2022: **31**
2021: 23



PhD defences

2022: **394**
2021: 431

Staff

Academic staff*



2022: **1,259 fte**
2021: 1,190 fte

Other academic staff



2022: **1,067 fte**
2021: 1,066 fte

- and support staff



PhD candidates (salaried)



2022: **2,557 fte**
2021: 2,477 fte

PhD candidates**

Headcount PhD candidates

2022: **3,146**
2021: 2,999

Headcount scholarship

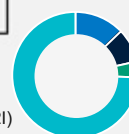
2022: **462**
2021: 523

Headcount industry

2022: **299**
2021: 309

Headcount standard (incl. FOM & M2I)

2022: **2,257**
2021: 2,039



Headcount other candidates

2022: **128**
2021: 128

Financial matters



Government funding



2022: **664.5M€**
2021: 618.6M€

Contract funding



2022: **58.0M€**
2021: 58.5M€

Indirect funding



2022: **169.5M€**
2021: 147.6M€

Note: For additional figures, see <https://www.tudelft.nl/en/about-tu-delft/facts-and-figures>

* Total FTEs for full professors, associate professors and lecturers.

** Number of people following doctoral programmes at TU Delft, regardless of whether they have been appointed and/or are funded by TU Delft.

Institutional profile

With approximately 27,000 students and 6,600 FTEs, TU Delft is the largest university of technology in the Netherlands. Born from a tradition of 180 years in civil engineering, we have developed a broad research portfolio that, divided across 40 departments and eight faculties, spans practically the entire range of engineering sciences.

The university's mission is to help solve global challenges by training new generations of socially responsible engineers and expanding the frontiers of the engineering sciences.

Impact for a better society

TU Delft's strategic plan is set out in the 2018–2024 Strategic Framework 'Impact for a better society'. Several basic principles to be developed further in this period run as a common thread through this framework: excellence, impact, involvement and openness. These characteristics are reflected in all our core activities, which can be divided into four main areas of operation: Students & Education, Research & Innovation, People & Community, and Campus & Services. The Strategic Framework is available at <https://www.tudelft.nl/en/about-tu-delft/strategy>.

The 2022–2024 Strategic Priorities complement the Strategic Framework. These priorities have been developed in response to major changes in recent years, including the COVID-19 pandemic.

Profile and Size

In early 2022, the Executive Board (EB) sought advice from an external advisory committee on the most productive way for TU Delft to responsibly address the challenges that have arisen from its growth in recent years and the social challenges it faces. The advisory committee that considered this question recommended to adopt a growth mindset for the sake of social demand.

Following this recommendation, the EB decided to initiate a consultation process among the university community on how TU Delft can fulfil its responsibilities and under what conditions it is possible to accommodate a growing number of students. On 5 December, the outcomes of the consultation were outlined and discussed with senior leadership and the employee representative body. The main outcome of the consultation was conditional support for further exploration of TU Delft's growth mindset and profile.

Following the recommendation and consultation process, the EB produced guidelines on how to further explore profile and size. These include accommodating independent local student enrolments and supporting and developing new academic activities at multiple sites. The conversation with the university community on profile and size and the strategy to be pursued will continue in 2023.

Management and organisation

Delft University of Technology, with its registered offices at Stevinweg 1, 2628 CN Delft, www.tudelft.nl, is an institution governed by public law, in accordance with the Higher Education and Scientific Research Act (WHW). Its main tasks are to provide university education, perform scientific research, transfer knowledge to society and promote a sense of social responsibility. The university is designated as a public benefit organisation (PBO). TU Delft's main administrative structure is established in the Higher Education and Research Act and in the Executive and Management Regulations and the Mandate Regulations, which are based on that Act. TU Delft has three administrative levels: the Executive Board, the faculties and the academic departments. The principle of integral management applies at these three administrative levels: the Executive Board, the deans and the departmental directors are responsible for both the primary process and for support. Besides the statutory rules for university administration, TU Delft follows the UNL Code for Good Governance, which took effect on 1 January 2020. The Code sets out nine general principles based on which administrators (at both central and faculty level) and supervisors can implement good governance for the benefit of the university's social remit. A point-by-point analysis of the Code was made in 2020 to ensure its proper implementation. After the Executive Board adopted the analysis, it was shared with the Supervisory Board.

Appendix 1 gives an overview of the faculties and departments. All support services have been clustered in University Services.

TU Delft and the COVID-19 Pandemic - Administrative action

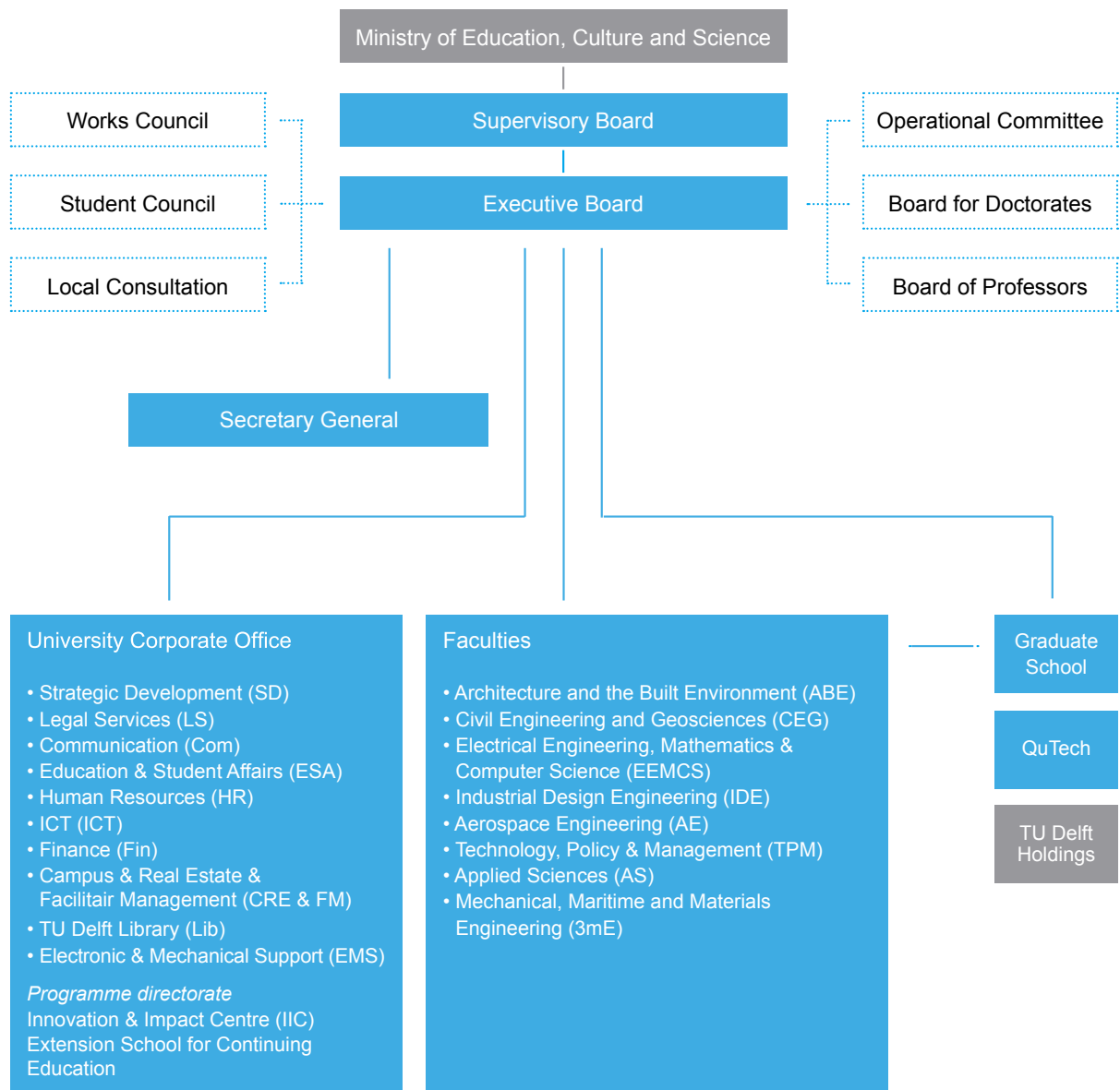
Although the year started with lockdown measures, it was possible to offer on-campus education again from 17 January 2022. COVID-19 measures were eased in several steps: no more maximum teaching group sizes, no obligation to wear masks, no coronavirus access control, abandoning the mandatory 1.5 metre social distancing, no more homeworking recommendations, until the recommendation to spend a maximum of 50% of the working week at the office was also abandoned.

Despite the COVID-19 measures being abandoned in 2022, the virus itself has not disappeared. The basic recommendations remained: wash your hands frequently, keep your distance, get plenty of fresh air, cough and sneeze into your elbow, stay at home if you have symptoms, get a vaccine or booster shot, and self-test.

After the COVID-19 measures were almost completely scaled down, the EB decided in April to discharge the Central Coronavirus Crisis Team (CCT), the Relaunch and Restart Task Forces and the associated Coordination Team. The structure of the Task Forces proved to be powerful and effective during the COVID-19 period. Two task forces – Educational Quality and Design and Complex Management and Facilities – have been re-established on standby mode to deal with any increase of infections and uncertainty about the development of the virus.

During the COVID-19 pandemic, there was also a focus on the long term at TU Delft. Among other initiatives, Strategic Response Teams (SRTs) worked on drawing up substantive strategic directions and proposals for targeted actions in several areas that are crucial to TU Delft. An analysis of external drivers was carried out for TU Delft parallel to this advisory process. This has led to the development of the 2022–2024 Strategic Priorities, which are both an update of the current 2018–2024 Strategic Framework and preparation for the new 2024–2030 Strategic Framework. The EB adopted the 2022–2024 Strategic Priorities on 25 May. The implementation plan was adopted on 7 June.

Organogram TU Delft



The homeworking policy during the COVID-19 pandemic prompted TU Delft to reconsider its view on work locations. The EB adopted the hybrid working policy on 5 July. This policy aims for an average ratio of no more than 40% remote working and at least 60% working on campus or at another work location designated by TU Delft. It is subject to work and social cohesion and to an individual arrangement being made between an employee and their supervisor.

In April 2022, as part of the long-term COVID-19 approach, the Minister of Education, Culture and Science drew up four scenarios for the education sector to prepare for. Based on the Coronavirus Sector Plan – by the Ministry of Education, Culture and Science, the Senior Secondary Vocational Education Council (MBO Council), the Association of Institutes of Higher Education, the Universities of the Netherlands and the Dutch National Student Association (ISO) – all educational institutions prepared their own detailed plan, to make their own decisions about which measures to implement within the given frameworks. At TU Delft, this led to the Medium-Term Coronavirus Strategy. The EB adopted the Strategy on 1 November 2022. The Strategy distinguishes four scenarios for the course of the coronavirus pandemic and provides a framework for implementing preventive and other measures.

2 Teaching and students



TU Delft trains students to be prepared to contribute to solving current and future problems in society. An active student community organises many social and cultural activities. The COVID-19 pandemic showed that the campus is an indispensable educational and meeting place. In January 2022, the university reopened to all students after a lockdown. Restoration, renewal and the return of physical campus education dominated throughout 2022.

2.1 Student in the right place

Alignment with VWO ('pre-university education')

TU Delft organises activities for schools and pupils in their first and second stage of secondary education to ensure proper alignment with the VWO ('pre-university education'). In the first stage of secondary education, this mainly involves classroom workshops. Such a workshop gives pupils a basis with which to make a more informed subject cluster choice. In the second stage of secondary school, the focus is on individual pupils with an interest in science subjects.

To appeal to as diverse an audience as possible, the choice of topics is chosen carefully. Digital opportunities are also offered in all programmes, allowing pupils for whom TU Delft is a less obvious choice to prepare themselves in terms of the content of a technical degree programme. Examples include guidance on school projects, the TU Delft Pre-University Programme, guest lectures and the online test study modules of TU Delft's undergraduate programmes.

As part of the 4TU initiative, a pilot project to develop a common platform for the four universities of technology to provide existing and new teaching materials online took place in 2022. The basic idea behind the platform is to apply and integrate science subject matter in the VWO ('pre-university education') and to develop academic and study skills.

Information

Informing prospective students is fundamentally aimed at encouraging them to make a conscious and appropriate choice. The total information package is therefore aimed at enthusing, informing and making the prospective student think.

For the first time in over two years, we held open days for prospective Bachelor's degree programme students on campus again in autumn 2022. Over 10,000 visitors attended, probably because many pupils had not yet been able to visit TU Delft because of COVID-19 measures. We organised another market for prospective Master's students in the Aula Building for the first time again in spring 2022. Training sessions in both spring and autumn also took place online, because we also want to offer distance-learning students at home and abroad the opportunity to participate.

One principle of the information is that prospective students will actively look for a degree programme that suits them ('making an effort is a qualifier'). TU Delft's informational activities are thus based on the 'flipping the classroom' principle. All information about the content of a degree programme can be found online. The informational activities also facilitate one-to-one contact to ask personal questions. In 2022, TU Delft organised more opportunities for online personal contact than in previous years.

TU Delft advises all prospective students to also visit the campus to get a feel for their intended degree programme, as factors such as feeling and compatibility play a vital role in making the right programme choice. Campus tours are organised every Friday afternoon and taster days are offered for each undergraduate programme. December 2022 also saw the launch of the do-it-yourself campus tour VisiTUs, which is even more responsive to the need to visit the campus at a convenient time for the prospective student. A social media campaign has been launched as part of the ongoing *Delft doe je niet zomaar* (Delft is not something you just do) initiative, which aims to capture and strengthen students' imagination.

Finally: TU Delft's informational activities take place on the TU Delft campus, at schools in the Netherlands or online. TU Delft does not visit foreign fairs to inform students.

Mandatory programme choice check

To help prospective Bachelor's students make a well-informed programme choice, TU Delft offers a programme choice check (PCC) with immediate feedback. For most degree programmes without a cap on student intake (*numerus fixus*) a PCC is voluntary, which can be used by those who apply before 1 May. However, the Bachelor's degree programmes in Electrical Engineering, Applied Physics, Applied Mathematics and Maritime Engineering have a mandatory programme choice check for the 2023–2024 academic year. The first experiences with this mandatory arrangement were gained in 2020–2021. Prospective students gain a better idea of the degree programme, already know some fellow students and lecturers, and know how to find academic counsellors immediately, which all makes for a productive start to the academic year. And the department can better anticipate the number of first-year students it will have, allowing it to allocate staff and space more effectively.

Co-operation with secondary school teachers

Bètasteunpunt Zuid-Holland is a network of 60 secondary schools. Organisationally, the network comes under the TU Delft teacher training programme and is a partner in the South Holland Education Network. The network facilitates various meetings and activities for developing teaching skills in the STEM school subjects: nature, life and technology (NLT), design, mathematics, computer science, physics and chemistry. All activities aim to work with secondary school science teachers to promote connection, progression and student success and to reduce dropout rates. Some 75 activities were held in the 2021–2022 academic year, with over 600 teachers signing up for one or more activities.

Co-operation with universities of applied sciences

The 4TU.Federation's Sector Plan for Science and Technology Education is developing and implementing several projects, focused mainly on the Bachelor's programmes in Computer Science, Electrical Engineering and Mechanical Engineering. These projects, aimed at improving the education chain, involve co-operation with universities of applied sciences. Co-operation also occurs with The Hague University of Applied Sciences, Rotterdam University of Applied Sciences and InHolland Delft as part of the Bètasteunpunt Zuid-Holland.

Two exchange projects were launched in 2022. Both involve cooperating with the university of applied sciences (The Hague University of Applied Sciences and InHolland Delft). The projects aim to improve the integration of students transferring from TU Delft to universities of applied sciences and to better understand the differences between the three educational institutions before the pupil chooses their programme.

2.2 A positive study climate

Student development

Psychological support for students and doctoral candidates

More and more students and doctoral candidates are grappling with major social issues that affect them individually. To meet the growing demand for support and help from students and doctoral candidates, the team of university psychologists has grown from seven to fourteen (including two prevention psychologists).

The team has seen about 3,000 people for individual consultations and at daily appointments. It also provides support to student initiatives for the well-being of fellow students, such as Hii and Masterclass.

During Reception Week (OWee), Queen Maxima and Minister Dijkgraaf of Education, Culture and Science visited the information market where students learn about associations, what's on offer on campus and activities in the city. They spoke to students about performance pressure, stress and loneliness. Two round-table discussions with MINDUS followed in which mental well-being was further explored with students and the administrators involved.

Prevention

This year, two prevention psychologists set up TU Delft-wide and faculty-based initiatives to assist students in their studies. One project is a video campaign by and for students involving student associations in the Faculty of Mechanical, Maritime & Materials Engineering (3mE). Topics covered include saying no, asking for help, ambitions and how to combine all of that with a social life alongside the degree programme. Our hope is that these personal stories will provide recognition and inspiration to other students. This campaign will also be implemented in other faculties in 2023.

Studying with a disability

Horizon is the help desk for students with disabilities or other support needs, such as student parents or caregivers. Besides providing information to students and staff, Horizon organises refresher courses for staff and provides advice to faculties and students. There is an open consultation hour for students and information is given to prospective students on information days. Horizon also manages and delivers central facilities and helps develop new ones.

In the spring, the Student Counsellor and Student Unlimited organised *Onbeperkt Studeren* (Enabled TU Delft) week, an event on the topic of studying with a disability. From Horizon, the student counsellors work with faculties and *Student Onbeperkt* (Enabled Student) to improve the environment and guidance for students with disabilities or support needs.

Career Centre

TU Delft's Career Centre offers students, doctoral candidates, post-doctoral researchers and alumni support in taking the first steps in their careers by organising workshops, training courses and individual guidance, among other assistance.

In 2022, the Career Centre organised a hybrid TU Delft YourCareer week twice. This week consisted of online workshops, company presentations, live speed dates and CV checks. More than 50 companies were involved. TU Delft Career Centre celebrated its 12.5 year anniversary during the YourCareer week in November 2022.

The launch of the Career Paths project has fulfilled a long-held ambition: developing an online tool that allows students to gain insight into possible career choices.

The TU Delft Career Centre has expanded its offer of programme choice support and guidance. Besides workshops on considering a change in your programme choice and Master's programme choices and regular one-to-one guidance, there is now also the possibility of short online counselling sessions. Students make frequent use of this.

Doctoral Education

Doctoral Education teaching for doctoral candidates was gradually offered again on campus in 2022. The transition from online to campus was accompanied by various challenges, including in relation to facilities and training format. The Graduate School aims to return to offering 60% on-campus teaching from January 2023. The Graduate School is tendering for the purchase of the Doctoral Education programme training courses that are externally contracted for a longer period.

Campus, degree programme and study climate

The Study Climate programme (SC) aims to improve the study climate and prioritises student success. The SC works within the TU Delft educational community to raise awareness, generate and share knowledge and create a common language on issues that affect the study climate.

Focal points of the past year include defining the duty of care for students, aligning it with the vision of student guidance and overseeing the guidance chain at TU Delft. The implementation recommendation will be submitted to the EB in early 2023. A draft vision has also been developed for Teaching & Learning, focusing on the growth of both students and staff. The vision must provide direction to lecturers, education management, support staff and students when it comes to on-campus, online and blended education. Achieving an optimal study climate hinges on connecting with students. The SC has therefore strengthened the relationship with student organisations and students are encouraged and supported to become actively involved in promoting student success. For example, several mental well-being projects have been undertaken with students. This includes encouraging vulnerable sharing and peer support and raising awareness of the range of support options available within and outside the university.

Student Welfare

Student welfare remains a key focus; within TU Delft but also nationally. A commitment to students and a focus on student success go hand in hand. In the national context, TU Delft has helped create 'Vision on Student Welfare by Universities of the Netherlands'. And it has provided input on the 'National framework integrated approach to student welfare' commissioned by the Ministry of Education, Culture and Science.

At TU Delft, student supervisors, education management and administration and student leaders pay considerable attention to student welfare. The 'How are you?' week for and with students, offered a range of inspiring workshops. Attention was also given to the role of inclusiveness in student welfare through two 'Study Climate Tribe Sessions', at which dilemmas, questions and best practices were shared with students and interested parties from education.

Attention to alcohol and substance use

The adverse effects of alcohol and the use of narcotics or stimulants among students and staff have received increasing attention in recent years. In the 2018 National Prevention Agreement, the government, along with 70 social organisations, including UNL, made arrangements to reduce risky alcohol use in the Netherlands. Co-operation for the purpose of Responsible Alcohol Consumption is taking place with the student associations, the alcohol clinic of the Reinier de Graaf Hospital, the Red Cross and the municipality of Delft. The impact on student welfare, inclusiveness and student success are all reasons to pay explicit attention to this issue. In line with the National Prevention Agreement, TU Delft aims to create a healthy, socially safe and inclusive work and study environment. In 2022, TU Delft drafted its own Alcohol and Substances Policy, which, for example, restricts the availability of alcohol on campus until 5pm, but also includes prevention and counselling.

A balanced international classroom

For its English-language degree programmes, TU Delft aims to provide a balanced international classroom that guarantees access for Dutch students. Some degree programmes have had difficulties in creating a balanced classroom for the 2022–2023 academic year. This is because of legal restrictions on being able to select and refuse international students. Even so, TU Delft continues to attract students from abroad. In addition to the international classroom, there are many ways in which Delft students can do part of their programme (courses, internships or graduation projects) abroad, thus improving their intercultural skills. From spring 2022, some exchange programmes were possible again following the COVID-19 pandemic. From September 2022, the full exchange programme resumed, with the exception of China. In 2021-2022, 604 students from TU Delft went on exchange to partner institutions, while 487 students from partner institutions came to TU Delft.

Promoting a diverse international intake

Scholarships help to achieve a diverse international intake. Various Master's degree programme scholarships – e.g. Holland Scholarships – were awarded in 2022. Twenty international students received a full grant from the Louise and Justus van Effen Scholarship Fund in 2022. A total of 100 scholarships were issued to TU Delft students.

2.3 Ongoing innovation

Extension School

Education for professionals

In 2022, The TU Delft Extension School for Continuing Education (ES) continued the path started in 2021 as an independent unit. Sixteen new subjects and nine programmes have been added to the range available for professionals. In addition, four premium courses are being piloted on the FutureLearn platform. The range now consists of 227 subjects and 36 programmes, divided into seven themes: Energy Transition, Sustainable Cities, Future of Transportation, Medical Technology, Quantum Technology, Skills for Engineers, and Artificial Intelligence, Data & Digitalisation.

In 2022, the Massive Open Online Courses (MOOCs) offered by the Extension School through www.edx.org had 222,679 enrolments. In total, more than 9,000 certificates were awarded. Registrations for paid courses continued to grow to nearly 1,200.

STAP grant

The Extension School also joined the STAP grant system in 2022. From the summer, residents of the Netherlands can receive up to a €1,000 grant for a selection of subjects. Sixty participants have already registered for Extension School courses in the first two rounds.

Microcredentials

The Extension School participates in SURF's national microcredentials pilot project, and the first credentials were awarded for three Aerospace Engineering subjects in 2022. The Extension School is also one of the leading partners in the global Digital Credentials Consortium focusing on digital credentials in education. The open-source Learner Credential Wallet, which was launched in 2022, allows learners to manage their own certified credentials in a phone app.

Quality assurance

In 2022, the Extension School continued to develop quality assurance with QA indicators at three levels: institution, portfolio and subjects. These indicators follow TU Delft's framework for initial education, supplemented by international education best practices.

Anniversary activities

During the anniversary year, the Extension School engaged in several activities relating to energy transition. Three online webinars were organised with the Alumni Office. Each webinar brought updates on solar energy, offshore wind energy and the digital transformation of our energy system to more than 80 participants.

EnergySwitch

The EnergySwitch project, which was launched in 2022, is one of the projects on the Human Capital Agenda of the Economic Board Zuid-Holland (EBZ). The project, coordinated by the Extension School, consists of more than 20 participants from education, municipalities, the business community and trade associations. The project aims to boost lifelong learning in energy transition in the province.

Awards

2022 edX Prize

The MOOC Global Housing Design by the architecture course team led by Dick van Gameren has won the 2022 edX Prize.

Leadership Award

Ir. W.F. van Valkenburg, executive director of the Extension School, received the Outstanding Leadership Award at the Education 2.0 conference for his efforts in lifelong learning and open education.

Open Education Week 2022

During Open Education Week 2022, held in March, the Extension School presented nine Open Education Ambassador Awards to the following lecturers: Prof. Conny Bakker (Faculty of IDE), dr.ir. Gautham Ram Chandra Mouli (Faculty of EEMCS), Prof. Jill Slinger (Faculty of TPM), dr.ir. Gillian Saunders (Faculty of AE), Prof. Jenny Dankelman (Faculty of 3mE), dr.ir. Marian Bosch-Rekvelde (Faculty of CEG), dr.ir. Menno Veldhorst (QuTech), dr. Sander Otte (Faculty of AS), Prof. Tillmann Klein (Faculty of A+BE).

Teaching rooms

New Echo teaching building

Echo, the general teaching building, opened its doors in June 2022. The building houses over 1,300 teaching places and 400 study places. It is suitable for classroom learning, blended learning, project teaching and exams. This has temporarily eased, but not yet eliminated, the pressure on teaching spaces because of the growing student population. In particular, Echo provides large-group teaching spaces that can be divided into smaller rooms using portable walls. In this way, alternating group sizes can be accommodated and the space is used efficiently. The facilities in the teaching rooms meet TU Delft's latest standards, including facilities for hybrid teaching and recording. Echo is the first energy-generating building on campus. Preparations are underway to build a temporary teaching building and a general teaching building to accommodate the growing student population.

Teaching Lab / Teaching Academy

Lecturer of the year

On 10 November 2022, the TU Delft held its Education Day themed 'The Connection'. The TU Delft lecturer of the year was also announced at this event, attended by 220 lecturers and teaching support staff in the Teaching Lab: Ir. Christien Janssen, lecturer in Building Physics (AE&T) at the Faculty of Architecture and the Built Environment.

TU Delft Education Fellows

Besides lecturer of the year, the Teaching Academy also announced other teaching awards on 10 November 2022. The TU Delft Education Fellowship recognises and values lecturers for educational innovation and increases their impact on education. Every year, new Education Fellows are nominated by the deans and appointed by a selection committee chaired by the Vice President of Education, Prof. Rob Mudde. Three new Education Fellows have been appointed and started for 2022: dr. Cynthia Liem, dr. Bijoy Bera and ir. Stefan Hugtenburg. This brings the total number of TU Delft Education Fellows to 26.

Teaching team award

The teaching team award was presented for the first time in 2022. The teaching team award has been created to recognise and value team collaboration for the purpose of teaching and innovation in teaching. Each faculty could nominate a team and a selection committee chaired by the Vice President of Education named the finalists and winner.

The winner of the 2022 teaching team award was Team 'PRIME: Programme of Innovation in Mathematics Education' (Faculty of EEMCS). The other finalists were 'Nanobiology Transdisciplinary Research Program' team (Faculty of AS) and 'CSETT: Computer Science & Engineering Teaching' team (Faculty of EEMCS).

Strengthening Engineering Education

Connecting, sharing, experimenting and showcasing are what the Teaching Academy and the Teaching Lab are all about. Learning from each other's teaching, experiments, thoughts and ideas, to inspire each other, to strengthen engineering education and to innovate where desired, together, across faculty boundaries.

Last year – as part of Recognise & Appreciate – the 'Kickstart your Teaching' programme was launched for new lecturers to help them get off to a good start in teaching. Part of the programme includes the 'Adventures in Teaching' podcast, the first season of which was released in 2022. Various activities were also organised each month. Journal Clubs (discussing education-related publications), Education Conversations (discussing current education topics), Meet & Eats (where lecturers share their educational innovation) and various theme-driven networking meetings.

Master's degree programmes

Innovating Master's degree programmes

TU Delft has the task of preparing future engineers for their role in society in the best possible way. A key part of this is making Delft degree programmes more interdisciplinary. In July 2022, the EB decided to allow electives in all TU Delft Master's degree programmes, thus creating space for interdisciplinarity. Practically, this decision means that the fifth period in each Master's degree programme will be fully freed up for electives of 15 ECs. In this way, the Master's degree programme retains a strong foundation of cutting-edge disciplinary knowledge and expertise, while creating space for interdisciplinarity. Faculties offer modules to fill the electives space. In September 2022, deans were asked to communicate this decision internally and develop a faculty action plan for its implementation. By 1 September 2025, all Master's degree programmes at TU Delft must have their fifth period fully freed up.

2.4 Support and facilities

Lecturer support

The aim of the Teaching and Learning Services (TLS) team is to provide lecturers with the best possible support when they have any teaching-related questions. Lecturer support needs remain high, including with the increasing number of educational tools (such as the new online testing platform ANS), the growing demand for blended learning, lecturer development in terms of lifelong learning and project-based support.

The Education Innovation (EI) team was recently established within TLS. In 2022, TLS EI initiated, managed or supported 49 projects and programmes. These included the Exchange Day, support for DEE (Digital Excellence for Education) projects and parts of the Study Climate programme.

The Blended Learning team supports lecturers with blended and hybrid teaching, testing, feedback, curriculum development and much more. This team has also set up pilot projects for teaching tools (such as an e-portfolio and ANS print-to-scan), helped build communities of lecturers and students, and organised a blended course design bootcamp.

Training courses for Boards of Examiners and Boards of Studies

The training team's main task is to develop and offer courses to train and help develop lecturers. This includes the UTQ (University Teaching Qualification); the national certification for university lecturers. As TU Delft continues to grow, TLS is seeing increased demand for training.

The increase in supply for UTQ training is 22% compared to 2020. The team has developed a large number of new courses, especially for the Continuous Professional Development (CPD) offering:

- UTQ mentor programme
- Board of Examiners training
- Board of Studies course
- Senior Exam Qualification (SEQ)

Assessment

Lecturers are also offered support on Testing, both through the teaching support web page and help desk, and in the form of advice and training. A new Board of Examiners course has been established in close cooperation with the policy team and Legal Services. This new course has also ensured that the manual for Boards of Examiners has been updated.

TLS has also introduced a new course for assessment advisers and teachers; the Senior Exam Qualification (SEQ), making them more professional on cross-curricular testing programmes and allowing them to call themselves certified Assessment Experts. Over time, this will also lead to improvements in assessment programmes and faculty assessment policies.

2.5 Accreditation and accountability

Accreditation of Bachelor's and Master's degree programmes

The following programmes were assessed in 2022 and received positive recommendations:

- 'Nanobiology' (Bachelor's degree programme, AS)
- 'Nanobiology' (Master's degree programme, AS)
- 'Electrical Engineering' (Bachelor's degree programme, EEMCS)
- 'Electrical Engineering' (Master's degree programme, EEMCS)
- 'Science, Education and Communication' (SEC, Master's degree programme, AS), pending decision.

Institutional Quality Assurance Audit for Accreditation (ITK)

At the end of 2021, the umbrella organisations Association of Institutes of Higher Education (VH) and UNL submitted a joint application for a two-year postponement of institutional accreditation for a number of higher education institutions. The reason for this application was the expectations raised about the upcoming ITK cycle and the discussion about introducing institutional accreditation. The COVID-19 pandemic also put a lot of work and other pressure on institutions. In February 2022, the Ministry of Education, Culture and Science approved the application. The new submission date for Delft University of Technology's ITK is thus 20 November 2025.

New degree programmes

In April, Delft University of Technology received the positive decision from the Accreditation Organisation of the Netherlands & Flanders (NVAO) regarding the application for the new Master's degree programme in Environmental Engineering (Faculty of CEG). The Master's degree programme in Environmental Engineering teaches students to deal with the scarcity and abundance of resources such as water and waste, the impact of climate change on urban quality of life, air pollution and the depletion of natural resources such as groundwater. These challenges are paramount in a changing world that is experiencing population growth and demands more clean resources than ever before. The programme started in September 2022.

The planning-neutral merger of the two existing Master's degree programmes 'Computer Engineering' and 'Embedded Systems' (Faculty of EEMCS) has been successfully completed. The merged programmes will continue as the Master's degree programme 'Computer & Embedded Systems Engineering' from 2023–2024. Students learn about advanced computer and software systems, systems engineering and computer architectures for embedded applications and high performance systems. The intended start date is in September 2023.

The assessment committee visited the new programme 'Quantum Information Science & Technology' (QIST, Faculty of AS) in November. The assessment committee has made a positive recommendation to the NVAO. The QIST programme involves understanding, designing, building and researching quantum information processing systems, such as quantum computers, quantum communication networks and quantum sensors. The aim of the Master's degree programme is to provide students with in-depth and combined knowledge from the four disciplines of quantum physics/physics, mathematics, electrical engineering and computer science to enable them to stay at the forefront of fundamental quantum technology knowledge and develop practical applications in the field. The intended start date is in September 2023.

Accreditation of professional education

There were no professional education accreditation activities in 2022.

Educational module

TU Delft is participating in the Educational Module Experiment (under the Flexible Higher Education Experiments Decree). Sixteen students participated in the 2021–2022 academic year, half the number who participated in 2020–2021. The experiment was extended in 2019 to the end of June 2022. The same conditions apply until the law takes effect. Because of the extension, the report on learning outcomes for the period 2016 to 2020 will be drawn up after 2022.

2.6 NPO education

In 2022, the National Education Programme (NPO) entered its second year of implementation.

Process-based

The spending plan for the NPO funds was drawn up with input from the faculties, degree programmes and departments. The General Assembly of Councils of the Works Council and Student Council was involved with the EB in setting up the plans before the formal decision-making. The plan was approved on 8 July 2021. The EB then took a final decision on 13 July 2021.

The NPO central project manager and the finance department hold quarterly meetings on expenditure, so that any under-spending can be identified and adjustments can be made in time. The NPO central project manager meets with all project managers to discuss the progress of the projects at least twice a year. Two progress reports were prepared in 2022 as a result of these discussions. These reports were also sent to the employee representative bodies. The project manager is responsible for spending the project budget; item shifting is possible without central approval. However, consultation is necessary for a completely different project content or use of the money. If the content of the project differs from what was previously agreed with the employee representative bodies, this will also be discussed with them.

Some projects involve external stakeholders, such as internship supervisors, the municipality and other universities. The respective project manager involves them in carrying out the project. The degree of involvement depends on the context of the project.

Content

The original plan provides for projects in four areas:

- Intake and mobility
- Well-being
- Internship issues
- Teacher training programme

The delay incurred in 2021 because of the COVID-19 pandemic and associated restrictive measures has not yet been fully caught up in most projects. There is also still a noticeable shortage of personnel, as a result of which some projects have had to adapt their procedures or are expected to run over time.

Theme	2021 expenditure	Budgeted for 2022	2022 expenditure	Budgeted for 2023	Budgeted for 2024	Total spent	Total budgeted
Intake and mobility	71,507	732,500	635,705	517,852	221,936	707,212	739,788
Well-being	201,407	1,702,556	582,130	1,490,313	909,707	783,537	2,400,020
Internship issues	17,571	60,000	96,029	28,980	554,423	113,600	583,403
Teacher training programme	-	300,000	58,052	379,364	162,584	58,052	541,948
Total	290,485	2,795,056	1,371,916	2,416,509	1,848,650	1,662,401	4,265,159

Seven intake and mobility projects were eventually set up at TU Delft and are working on the national plan.

Major progress has been made in the MOOC Pre-Master Mathematics for Engineers project in 2022. The first three MOOCs have been completed: *Linear Algebra part I*, *Probability and Calculus I*. The launch of all six MOOCs on EdX is scheduled for summer 2023. The after-care course for international students who took a Dutch language course remotely has been successful. Several groups have started the short course. The short course reflected on the content of the language course taken online and continued to provide an introduction to the language and the country. The participants are extremely enthusiastic and through the course have become part of a network, have increased their knowledge of the Dutch language and the city of Delft. The short course goals have been achieved.

Two projects on intake and mobility did not start in 2022. One project will still start in 2023, focusing on mathematics and study methods for prospective students. The 'Improving feedback to students' project will no longer start. This is due to the scale and additional ICT component that is not possible within NPO. The Teamwork project has now been funded from other resources, so there is no longer a need to rely on NPO resources.

PRogram of Innovation in MECHanics education (PRIMECH) is aimed at redesigning some courses. A community of practice on statics, mechanics of materials and dynamics was established in 2022. Workshops were organised for all Statistics lecturers. The 'Reflection as a core competence' project was piloted in courses in 2022. Over the past year, the focus of the project has shifted from reflection as a core competence focusing on study success to reflection as a core competence of an engineer.

Seven student welfare projects were eventually set up at TU Delft and are working on the national plan. The main focus here has been on prevention. Prevention psychologists continued to be added in 2022. They conduct workshops and develop interventions. A temporary workforce to enable rapid upscaling in psychological care was also used again in 2022. As a result, the waiting time for university psychologists has remained acceptable in 2022.

Various activities have been organised to welcome students for the first time or back to the university and make them feel at home. Because of NPO, we see that student societies can play a bigger role in connecting students to the university and in building and maintaining a network. Theme weeks and various well-being activities were also organised as part of several NPO projects. A MOOC was launched in 2022, providing a first online introduction to Dutch, the Netherlands and TU Delft, aimed specifically at the international students coming to Delft for their degree programmes. The MOOC is based on the Delft language method and can be followed from the student's home country in six weeks. As a result, these new students have a 'softer landing'. We received many requests to participate, including from outside TU Delft. A scaling-up of the platform on which the MOOC is offered is therefore needed.

In 2023, a change in insights means two projects focusing on a festival and a sports card for all students will be implemented differently. Since no funds from these projects were spent in 2021 and 2022, we have a substantial underspend on them.

The 2022 Reception Week (OWee) also saw NPO-related adjustments. These included outreach to international students, current second year students who were unable to attend an introduction period last year, an online section and a greater focus on mental well-being. All these adjustments were made satisfactorily.

The coronavirus pandemic caused internship problems for two degree programmes. In the Master's degree programme of Aerospace Engineering, travel restrictions created a backlog of students taking up their internships. In 2021 and 2022, all students with such backlogs were approached, their internships were approved faster and the department actively helped them more to find internships. The lifting of travel restrictions has also helped. The NPO project was successfully completed in the summer of 2022. In the Master's degree programme of Technical Medicine, internships are done in the hospital and supervision should also occur there. The COVID-19 pandemic made that far more difficult. The department looked for a way within the NPO project to still properly shape the students' reflection on their clinical experience. A digital portfolio enabling reflection and monitoring of ongoing development was developed and first piloted in 2022.

The teacher training institute has written a new project plan for spending NPO funds in 2022. As this plan started later in 2022, the full planned budget was not spent. The plan focuses on the use of online teacher training programmes, so that students can have more flexible education through them. Teaching materials will also be designed so that a lecturer gains the right skills to eventually be able to teach effectively, whether through online or hybrid education. The effectiveness of internships will be enhanced and the connection between the student and the university increased. All these projects started in 2022.

In 2023 and 2024, some projects will be expanded or funds reallocated to achieve full spending.

3

Research and innovation



TU Delft champions high-quality research and innovation that combines science, technology and design while maintaining strong links to education. TU Delft regards it as its core duty to contribute to the United Nations Sustainable Development Goals, and its research is accordingly driven to a large extent by the demand for technological solutions to social problems. To this end, TU Delft develops ecosystems for innovation on and around the campus – in collaboration with leading international research bodies, industry and local social partners.

3.1 Research

Research collaborations

Convergence Alliance

The complex social challenges we face today – including climate change and urbanisation, the impact of digitalisation and the increased role of technology, and the sustainability of our healthcare system – call for pioneering scientific insights and a holistic approach. For this reason, TU Delft, Erasmus University and Erasmus MC started intensively co-operating across disciplines and institutions in 2019. This co-operation brings together and strengthens knowledge and skills from the socio-economic, medical and engineering sciences, creating the research and education infrastructure, and even new disciplines, needed to understand and solve complex social problems.

Building on the foundations laid earlier, much was achieved in 2022 through the combined efforts of all Convergence community stakeholders. As a result, many new projects were launched, existing collaborations strengthened and new partnerships formed. New curricula were developed and launched and well-received events, conferences and workshops were organised. And a first step was taken in Convergence's organisational development. Some milestones for 2022 are discussed below.

Work continued on developing transdisciplinary education and research across the five programmes and themes that form the basis for the co-operation within Convergence. Both Resilient Delta and AI, Data & Digitalisation have launched new minors. Resilient Delta has launched the 'Impact Space' minor and AI, Data & Digitalisation has developed two new minors: 'Engineering with AI' and 'AI and/in society'. Resilient Delta received a nice boost with a grant from the Dutch Research Council (NWO) for the PATH2ZERO programme. And Health & Technology is also well on its way to launching the Ten Flagship projects. The Pandemic & Disaster Preparedness Centre is on track with recruitment for the Frontrunner projects. And Healthy Start has already appointed the first interdisciplinary doctoral candidate and first Convergence Fellow (as a link between science and society).

To connect with the region and society, events and conferences were organised to bring together academics, medical experts, policymakers, professionals from industry and society, entrepreneurs and students. Resilient Delta, for example, teamed up with Redesigning Delta Partners to organise the International Redesigning Delta Conference and socio-economic inequality and climate knowledge workshops with the municipality of Rotterdam and the Rotterdam University of Applied Sciences. Health and Technology rounded off the year nicely by organising the Science, Education & Innovation Festival, attended by more than 500 people.

Convergence attracted a lot of attention from political circles, the government and the business community in 2022. This has led, for example, to cooperation with the municipalities of Rotterdam and Delft to co-create demand-driven research 'with the city, for the city'. The cities function as living labs in this regard. And two ministries also made visits: the Minister of Education, Culture and Science visited the Circular Intensive Care project of Health & Technology, and the Minister of Health, Welfare and Sport gave a speech at Health & Technology's Battle of the Minds Hackathon. The Director of Curative Care at the Ministry of Health, Welfare and Sport opened the Health & Technology Data Hub. Chapter 4 deals with administrative cooperation in the Convergence context (see page 58).

The Leiden-Delft-Erasmus Universities (LDE) Strategic Alliance

In 2022, the LDE Centres and programmes continued their work, with research results also presented in white papers for the first time. The first white paper on critical materials, energy transition and geopolitics explains the energy transition – a transition from fossil fuels to metals needed to produce the necessary wind turbines, solar panels, batteries, and so forth – for policymakers and other interested parties. This makes these metals critical materials for the success of energy transition. Researchers from different fields interact in a second white paper on a healthy society. They arrive at a surprising view of health and how policy measures can influence it.

As for education, two new LDE minors were launched in 2022: *Space Missions and (Re)imagining Port Cities: Understanding Space, Society and Culture*. In the first minor, experts from Leiden University and TU Delft give students a broad understanding of the main disciplines involved, before they work in multidisciplinary teams on a space industry assignment. *(Re)imagining Port Cities* stems from the LDE Port City Futures academic programme and is open to all undergraduate students at LDE universities.

The LDE alliance started a decade ago and the first joint minor, *Responsible Innovation*, was launched in 2014. Today, there are 12 multidisciplinary minors on current social issues, attended by over 1,000 students from Leiden, Delft and Erasmus every year. Chapter 4 deals with administrative cooperation in the LDE context (see page 59).

Research schools

In 2022, TU Delft was the coordinating university for five research schools: the Advanced School for Computing & Imaging (ASCI), Centre for Technical Geoscience (CTG), Dutch Institute of Systems and Control (DISC), J.M. Burgerscentrum – Research School for Fluid Mechanics (JMBC) and Transport Infrastructure and Logistics (TRAIL). TU Delft has long-term financial arrangements with each of these research schools, which were effective specifically in 2022.

Horizon Europe Project –Skills4EOSC

The Library has received EU project funding for the Skills4EOSC project in which it has a leading role through the 4TU. Research Data team. International training networks for research data management will be developed as part of the European Open Science Cloud over the three-year project. The project is structured around six core activities (1) Minimum Viable Skill Sets, (2) Training-of-Trainers, (3) FAIR-by-design methodology for learning materials, (4) Harmonised curricula and learning pathways, (5) Lifelong learning through professional networks and (6) Skills4EOSC competence centre and support network (www.skills4eosc.eu).

TU Delft Digital Competence Centre

Research increasingly relies on digital technology to collect, process and store data, but also to write reusable code, develop or co-develop software and share results with the research community. To use these tools effectively, researchers need digital knowledge. Although they can acquire this knowledge themselves, it can also be contributed by others. This is where new roles such as data manager and research software engineer are emerging.

ICT and the Library jointly manage the TU Delft Digital Competence Centre (DCC), an initiative of the TU Delft Open Science Programme. Its activities include helping researchers to make research data FAIR and improving research software to increase the efficiency of the research process.

Since its inception, the DCC has provided advice, mentoring and software support to 57 projects across all faculties (<https://tudelftdcc.shinyapps.io/dccapp/>).

3.2 Focus areas

Delft Research-Based Initiatives

The three Delft Research-based Initiatives (DRIs) at TU Delft work on major social themes: Health, Energy and Deltas, and Infrastructure & Mobility. In 2022, the path embarked upon in 2019 continued, following the evaluation of the first ten years, in which the DRIs' activities increasingly focussed on 'harvesting' a limited number of specific themes, including by further strengthening partnerships (such as with the private sector and social partners), contributing to national and international agenda-setting, and raising external funding. This includes seeking and finding further embedment in the convergence initiatives and the TU Delft Climate Action programme.

The fourth DRI – the Delft Global Initiative – was established in 2015 and has since managed to build a powerful and active network. In this network, Delft academics and partners in developing countries (knowledge institutions, entrepreneurs, NGOs and government) co-operate closely to jointly find concrete solutions to global social challenges.

TU Delft Institutes

In 2022, two TU Delft Institutes applied for and received extensions for another five-year period, namely the 'TU Delft Process Technology Institute' and the 'TU Delft Design for Values Institute'. The TU Delft Institutes inspire and support thematic, cross-faculty research at TU Delft. The bottom-up nature of the Institutes is important in this regard: the initiative to launch an Institute, and its further development, lies with the research community concerned. Funding is provided by the participating faculties and matched by the Executive Board (EB). Since the launch of the first Institutes in 2012, the total number of TU Delft Institutes has risen to 17: AgTech; Bioengineering; Climate; Computational Science & Engineering; Design for Values; E-Refinery; Optics; Powerweb; Process Technology; Rail; Robotics; Safety & Security; Space; Sports Engineering; Transport; Urban Energy and Wind Energy.

International engagement – Focus countries

In 2022, the core team of focus countries – Brazil, Greater China (GC) and India – focused strongly on communicating about TU Delft activities, including through its own website <https://www.tudelft.nl/brazil-china-india-collaborations>. Network management resulted in several foreign delegations to the Delft campus and consolidated strategic contacts with external stakeholders such as the government, ambassadors, think tanks like Clingendael, the European Commission and key partners in the focus countries. Joint seed-funding calls followed for Brazil and India, resulting in co-operation on research themes such as energy and climate, innovative materials, water and sustainable mobility. The China core team, led by the TU Delft Delegate China Academic Relations, appointed in 2022, explored the long-term collaboration approach with Chinese partners in talks with its members and deans partly in relation to the Knowledge Security theme. The existing TU Delft China tools also served as a starting point for a country-neutral partnership tool, which was further developed in the UNL context. Chapter 5 discusses the Knowledge Security theme in more detail (see page 72).

TU Delft Climate Action programme

The Climate Action Programme focuses on developing and strengthening university-wide interdisciplinary and multidisciplinary research programmes across four themes: climate science, climate change mitigation, climate change adaptation and climate change governance. TU Delft has allocated €22 million to this for the 2021–2030 period. Climate solutions are being worked on across the four themes in 17 research programmes. In 2022, most of the programmes started appointing additional academics. The Climate Action Programme also supports policymakers and administrators in climate change policymaking through The Hague Climate Action Hub and other partnerships such as the International Universities Climate Alliance. In autumn, the Climate Action Hub and the Climate Help Desk organised a training course for students from across the country to communicate their climate research insights to the media.

Energy transition

In 2022, TU Delft celebrated its 180th anniversary. The theme of the anniversary celebration was ‘Speeding up the Energy Transition’. Most of the Delft Energy Initiative’s activities were linked to the anniversary. The activities not only showed what is happening at TU Delft in relation to energy transition, but also what new impetus TU Delft is giving, with whom and what is needed to get there. A selection of the activities: an Energy Challenge that put energy transition firmly on the education agenda with 15,000 student participants. There were energy snacks: 180 portraits of people at the forefront of the energy transition; an accelerator team of 10 multidisciplinary researchers was presented, and anniversary labs were created. These research facilities to accelerate the energy transition included the 24/7 Energy Lab, the Floating Renewables Lab and the Control Room of the Future. In addition, 300 innovative energy transition ideas were identified across the university. The details have been compiled in a booklet, which is available online (<https://issuu.com/tudelft-mediasolutions/docs/home-of-innovation-projectten-2022>)

TU Delft AI Initiative

The TU Delft AI Initiative, which was established in 2021 and provides a central platform for research, education and innovation in AI, data and digitalisation, saw strong development in 2022, both in terms of numbers of people and visibility. The Labs & Talent programme added

eight labs in 2022, meaning there are now 24 TU Delft AI labs across all eight faculties. These over 120 newly appointed researchers (including 96 doctoral candidates) are a major boost to TU Delft's ambitions in the field of AI, data and digitalisation.

A vibrant AI community is emerging at TU Delft, with a strong focus on themes such as AI in energy and sustainability, AI in health, AI in ports and the maritime sector, AI in technical industries, AI in peace, security and law, and values-driven human-centred AI and machine learning. In 2022, TU Delft established the Mondai | House of AI to connect and facilitate all stakeholders involved in researching and applying AI. Several AI events were organised for stakeholders from inside and outside the university in 2022.

Five Innovation Centres for AI (ICAI) labs have been set up in co-operation with ING, Booking.com, DSM, the Police and Ahold Delhaize. Knowledge institutions, companies and authorities work together in these ICAI labs to develop talent and technology in the field of AI.

TU Delft has been successful in attracting funding under the NWO LTP ROBUST in AI growth fund application. Also see Chapter 3.6: Valorisation.

3.4 Research quality

Research assessments

All TU Delft departments, clustered by research domain, are assessed once every six years by an independent, international committee based on a self-assessment and a site visit. The research assessments are held according to the Strategy Evaluation Protocol (SEP) 2021-2027 and the TU Delft Research Assessments Protocol (RAP, version 2021). Both can be found on the website <https://www.tudelft.nl/en/research/our-research-vision/quality-assurance>.

A key difference from the previous SEP is that there is no longer a quantitative final assessment. Instead, committees formulate positive points and recommendations for departments, substantiated by their observations. The plan of action, drawn up in response to the recommendations, and its follow-up become part of the constant dialogue between the EB and the faculties (through the Planning & Evaluation cycle). A light midterm assessment is also organised three years after the final assessment to continue monitoring research quality.

In 2022, the site visits for the Aerospace Engineering (five departments), Applied Mathematics (one department), Geosciences (two departments) and Architecture and the Built Environment (four departments) assessments took place. The site visits for Applied Physics (four departments) and Technology, Policy and Management (three departments) have been postponed for a few months and will take place in early 2023. The planned midterm assessments for Industrial Design (three departments) and Mechanical Engineering (seven departments) have been postponed because of a change of deans and therefore cover four instead of three years. The planning is available on the website <https://www.tudelft.nl/en/research/our-research-vision/quality-assurance/planning>.

The committees are mostly positive about the assessed departments and give a broad spectrum of recommendations as set out in the assessment reports (<https://www.tudelft.nl/en/research/our-research-vision/quality-assurance/results>).

QuTech

An international assessment committee chaired by Prof. Dave Blank assessed QuTech. The committee found that the quality of research and engineering activities is excellent. The committee also praised the entire QuTech team's enthusiasm and concluded that the institute is extremely well equipped to achieve its mission.

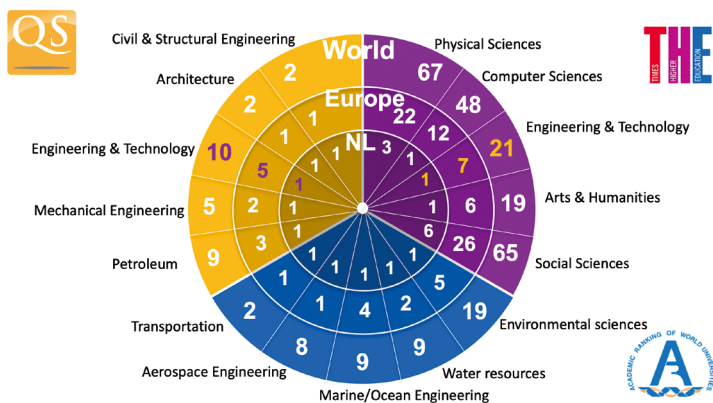
International rankings

Several organisations use international rankings to attempt to provide insight into the relative quality and positioning of universities. Although the ranking methodologies have their shortcomings, they give a rough indication of performance at certain levels. An overview of TU Delft's positioning in the three leading international rankings follows below. For more ranking information, go to: <https://www.tudelft.nl/en/about-tu-delft/facts-and-figures/tu-delft-in-international-rankings>.

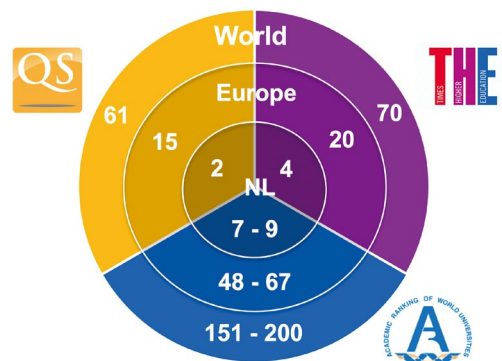
Engineering & Technology

Because TU Delft is a university of technology, the Engineering & Technology rankings are particularly relevant. TU Delft has been in the top 25 of the QS Engineering & Technology rankings every year since it began in 2003. In the past year, it ranked tenth worldwide, fifth in Europe and first in the Netherlands. In the Times Higher Education (THE) Engineering & Technology rankings, TU Delft has been in a stable position, ranking around 20th worldwide for the past nine years. This year, for the fourth consecutive year, it ranked 21st worldwide, seventh in Europe and first in the Netherlands.

Position TU Delft in subject rankings



Position TU Delft in world university rankings



Subject rankings

Subject rankings are rankings that focus on specific fields and are particularly relevant to faculties or departments. QS and ARWU (Shanghai) publish more than 50 subject rankings each year; THE publishes 11. TU Delft is ranked in a number of worldwide top positions each year. TU Delft is among the world's top 10 in these fields: Civil & Structural (2), Architecture (2), Transportation (2), Mechanical Engineering (5), Aerospace Engineering (8), Marine/Ocean Engineering (9), Petroleum (9), Water Resources (9) and Engineering & Technology as a broader subject area (10). In Europe, TU Delft is the highest ranked university in Civil & Structural, Architecture, Transportation and Aerospace Engineering and ranked second in Mechanical Engineering and Water Resources.

World university rankings

World university rankings are published yearly in which all universities are compared with each other. As a university of technology, TU Delft is compared with general and medical universities, among others. This year, TU Delft is ranked 61st in the QS rankings, 15th in Europe and second in the Netherlands. In the THE rankings, it is ranked 70th in the world and 20th in Europe. In the ARWU, it is again ranked in the 150–200 range; in Europe, TU Delft is ranked between position 48 and 67 and in the Netherlands between seven and nine. The position in the last ranking differs because of a different focus and methodology.

Theme rankings

Besides the aforementioned rankings, there are all kinds of thematic rankings focusing on job security, reputation or impact for example. Last year, TU Delft was placed in the following rankings, among others: 5th in the THE Impact ranking Industry, Innovation and Infrastructure, 23rd in the new QS Sustainability ranking, with a 7th place for Environmental Impact, 15th in THE Most International Universities in the World, 43rd in the THE Reputation Ranking and 87th in the THE Global University Employability Ranking.

Prestigious awards

Prof. Marileen Dogterom elected as new president of the Royal Netherlands Academy of Arts and Sciences (KNAW)

Marileen Dogterom, professor of Bionanoscience at TU Delft, became president of the KNAW on 1 June 2022. She is appointed for a period of three years, and she will combine the presidency with her academic work. Prof. Dogterom headed the Bionanoscience Department of the Kavli Institute of Nanoscience in Delft for a long time. She is one of the pioneers in the discipline of biomolecular and cellular physics. Prof. Dogterom was already very active at KNAW, as vice-president and administrative coordinator of all KNAW representatives in foreign bodies. She has all the qualities to be the figurehead of Dutch science as president of the KNAW.

Inauguration of new KNAW members

The Royal Netherlands Academy of Arts and Science (KNAW) has elected twenty-two new members, including Prof. Paulien Herder and Dr Stephanie Wehner. Members of the KNAW, distinguished scholars from all disciplines, are chosen for their academic achievements. The KNAW has around six hundred members. Membership is for life.

Prof. Ronald Hanson wins the 2022 Physics Prize

Besides being a leading researcher in quantum computing and the quantum internet, Ronald Hanson has played a key role in uniting the Dutch quantum physics community around a common vision and plan (the National Quantum Technology Agenda). He was also instrumental in securing funding from the National Growth Fund to deliver the agenda. These reasons led to him being awarded the 2022 Physics Prize.

Prof. Kees Vuik earns the Professor of Excellence Award

A Professor of Excellence excels at both research and education. Professors of Excellence are at the top tier of TU Delft and know how to inspire and motivate the next generation of Delft engineers. Professor Vuik was nominated because he has been an inspiring and enthusiastic mentor for both Bachelor's and Master's degree students, doctoral candidates, post-doctoral researchers and colleague academics for many years.

Dr Irene Dedoussi becomes a new member of De Jonge Akademie in 2022

De Jonge Akademie has added ten members to its ranks. These are researchers from different disciplines who have proven themselves scientifically and completed their doctorates less than a decade ago. One of them is Dr Irene Dedoussi, university lecturer in the area of the impact of aviation on the climate.

Royal honours for professors Kornelis Blok, Jaap Harlaar, Paulien Herder, Catholijn Jonker and Vice-Chancellor Rob Mudde

Prof. Kornelis Blok, professor of Energy System Analysis at the Faculty of Technology, Policy and Management (TPM), Prof. Jaap Harlaar, professor of Clinical Biomechanics at the Faculty of Mechanical, Maritime and Materials Engineering (3mE), Prof. Paulien Herder, dean of the Faculty of Applied Sciences (AS), Prof. Catholijn Jonker, professor of Interactive Intelligence at the Faculty of Electrical Engineering, Mathematics and Computer Science (EEMCS) and Prof. Rob Mudde, Vice-Rector Magnificus/Vice-President of Education on the Executive Board have been appointed Knights of the Order of the Netherlands Lion.

3.5 NPO Research

Background

Since autumn 2020, it has been possible for researchers whose work has been delayed due to coronavirus restrictions to have their employment contracts extended by an average of three months. This scheme for extending researchers' employment contracts ('the Coronavirus scheme') was based on an arrangement in the 2020 collective labour agreement.

The Coronavirus scheme has continued beyond 2020 and will continue this year. Although 2024 is a run-off year, NPO funds are expected to be fully used up in 2023.

Since 2021, funding for the Coronavirus scheme has come from different budgets:

	NWO funds 2021	NPO funds 2021	NPO funds 2022	NPO funds left for 2023
Budgets	€1.6 million	€5.3 million	€5.3 million	€4.0 million
Number of requests	132	22	220	
Funds spent	€1.6 million	€0.4 million	€6.1 million	

In 2022, 220 requests for extending employment contracts were granted, representing a budget spend of €6.1 million (rounded-off).

Because the NPO funds for the 2021 and 2022 calendar years have not been fully used, there is about €4 million left for 2023. However, much of this has already been allocated based on requests submitted in 2022. The remaining funds are expected to be fully spent in the first half of 2023. For this reason, the possibilities of using the budget for other purposes has not been explored further.

Details

Use of NPO funds

TU Delft's starting point is that employees must complete their research within the specified period. If they cannot do this and the specified criteria are met, a request for extension of the employment contract can be submitted.

Use of own resources and financial and non-financial measures

Since 2020, general measures have been taken to facilitate employees in limiting research delays. Examples of measures include setting up a proper home office, extended opening hours for labs and research infrastructure (some with 24-hour timetables) and specialised ICT support allowing remote use of advanced computing and research equipment.

Specific measures have also been implemented at department level or within research projects. Examples of measures include schedule adjustments, shifts in project budgets and relief from teaching duties. Examples of social measures include extra personal attention for doctoral candidates and post-doctoral researchers by supervisors, the Graduate School and extra coaching.

The number of researchers helped by these general and specific measures cannot be quantified. For the general measures, this is because they were not reserved for a specific group and the benefit received by each researcher varies. And the specific measures are often applied at the level of an individual or research project as part of arrangements between a supervisor/project manager and doctoral candidate or post-doctoral researcher – the number of researchers helped by specific agreements is impossible to determine because of this customised approach.

	NPO research funds	Own resources
Spent in euros	6,149,568	Not applicable
Number of researchers helped - unique individuals	220*	Not quantifiable

* This is the number of researchers helped in 2022, not the number of extensions. This involved extensions beyond the annual limit (2021/2022) for 43 researchers. Of these 220 researchers in the table, 43 have therefore also been allocated to 2021.

Process-based

The plan for spending the NPO research funds was drafted with input from the faculties and departments and shared with the Works Council and local trade unions on 8 December 2021.

On 16 December 2021, the General Assembly of Councils agreed to the proposed use of the NPO research funds. The EB then took a final decision on 18 January 2022.

An interim report of the spending and remaining NPO funds was prepared in October 2022. This report showed that sufficient budget was still available to continue the Coronavirus scheme in 2023. In October 2022, the Works Council was informed about the continuation of the existing policy in 2023.

HR and Finance conduct a limited assessment of extension requests, looking specifically at whether the specified criteria are met (about the target group, Coronavirus-related delay and extension duration).

The central project manager of NPO research and the finance department also have periodic meetings discussing expenditure. The budget is monitored at a consolidated, TUD-wide level. More frequent meetings will be held with the finance department in 2023 to ensure that the budget is not exceeded. This will also allow for communication in due time about an end to the scheme.

An update on the progress with spending NPO research funds is sent to the employee representative bodies every two years. The next update will be early in the second quarter of 2023. The update informs the employee representative bodies about the progress with the number of extension requests and quantifies the remaining budget.

3.6 Valorisation

Valorisation indicators

In 2012, Dutch universities set their valorisation targets in their performance agreements with the Ministry of Education, Culture and Science. Following this, each university developed its own valorisation indicators to measure performance. The following valorisation indicators were established in 2015, along with the other Dutch universities of technology, and they have been published in the annual report since 2016.

Financial matters	
Government funding (including other income)	€664.5 million
Indirect funding	€58.0 million
Contract funding	€169.5 million
EngD	
Number of EngDs	31
Co-publications with companies	
CWTS Leiden Ranking – University Industry Co-publications	#36
Proportion of publications with one or more companies as co-author	11.5%
Intellectual property	
Invention disclosures	101
Patent applications	69
Transfer agreements	4
Licences	2
Commercial activity	
Spin-offs started (including spin-offs by third parties) with TUD-IP	9
Start-ups started without TU Delft-IP	24
Ancillary activities	
Number of professors and associate professors with non-academic ancillary activities	303
Entrepreneurship programme	
Minors in Entrepreneurship (30 EC per minor)	226 students / 6,780 ECTS
Additional Entrepreneurship subjects (5-8 ECTS per subject)	1,158 students / 6,986 ECTS
Total number of ECTS for entrepreneurship programme	1,384 students / 13,766 ECTS

Intellectual property

Life returned to the campus when it reopened after the coronavirus measures. And this was reflected in the many requests for *Intellectual Property* (IP) help and projects where assistance was provided. This was accompanied by an influx of creative inventions from scientists with over a hundred Invention Disclosure Forms (IDFs) last year. Last year, dozens of first patent applications were granted to TU Delft and many transferred to industry. The companies with which we have co-operated to reach IP agreements range from start-ups (such as SolvGE, TilerCharge and SoundCell) to multinationals (KPN, C2CA Technologies, Royal HaskoningDHV, BASF and ASML). TU Delft also worked on supporting the fast-growing GROW (Wind-on-Sea) consortium, in renewing the framework agreement with Shell, in collaborating with EUR and EMC on IP convergence, and reflecting with other knowledge institutions on Quantum Delta NL's effectiveness in the IP field. QuTech and TU Delft's trademark rights have moreover been established in the UK, as a consequence of Brexit.

And there has been co-operation between various players on campus, including opening the Knowledge Security/Export Control Office, recruiting a Quantum Technology Officer and a Quantum IP Administrator for QuTech, and working with the Library to protect the rights for 4TU. ResearchData to enable an open science approach. MondAI has helped get the KickStartAI initiative off to a flying start, including an algorithm platform that will make AI software more accessible to society. Activities have also been undertaken to provide direct and accessible text and an explanation of IP rights, the relationship between IP and Open Science, and the importance of IP rights for co-operating with companies or establishing start-ups on the TU Delft Campus. The TU Delft Research Software Guidelines, which provide rules and guidelines for dealing with open source licences and software, have been brought to the organisation's attention.

Lastly, an update of IPMS (the patent administration system) has been implemented. This system is the crucial engine that supports the deadlines and arrangements around patent management. Preparations have also been made for the introduction of the European Unitary Patent that will allow a single patent valid in the Member States to be obtained in several European countries using a single European procedure (instead of the current bundle of patents).

Public-private co-operation

A significant number of new public-private partnerships were launched in 2022, in part due to the government's new funding vehicle, the National Growth Fund, which targets both social impact and economic growth.

TU Delft participated in a large number of Growth Fund applications that were awarded in 2022:

- High-Tech and Materials: NXTGEN HIGHTECH
- Agriculture, food, water and land use: Cellular Agriculture and CropXR
- Life Sciences & Health: BioTech Booster
- Energy and sustainable development: GreenPower II
- Mobility: Aviation in Transition

Two large Dutch Research Council (NWO)-funded 10-year LTP programmes have reinforced this.

The NWO (LTP PlantXR) and the Growth Fund investment (CropXR) together constitute nearly €100 million

Existing plant breeding techniques cannot properly improve complex characteristics such as resilience to extreme conditions (such as drought, heat and diseases). Utrecht University, Wageningen University & Research, TU Delft, the University of Amsterdam and the Dutch breeding industry (Plantum, RijkZwaan, Enza Zaden, KeyGene, Bejo Zaden, Genetwister, etc) will therefore combine plant and data sciences and artificial intelligence to develop, improve and exploit a revolutionary concept of 'smart breeding'. The NWO (LTP PlantXR) and Growth Fund investment (CropXR) of nearly €100 million gives the Dutch breeding sector the opportunity to increase its leading position in a fast-growing future export market.

NWO LTP ROBUST in AI with a €87 million investment

ROBUST's research agenda focuses on the principles underlying trusted AI and machine learning to realise AI's potential to create social impact. Six dimensions of trustworthy AI – accuracy, explicability, reliability, replicability, resilience and safety – will guide the development of algorithms to achieve specific goals prompted by the UN Sustainable Development Goals (SDGs).

The ROBUST programme focuses on attracting and retaining talent to work on the challenges of trusted AI, with 170 doctoral candidates over a ten-year period. ROBUST also makes research and innovation a shared responsibility of various stakeholders. It practises learning by doing in the Dutch context, through use-inspired research, links with start-ups and SMEs, and extensive knowledge-sharing efforts. Seventeen knowledge institutions, 19 co-funding industrial partners and 15 co-operating partners participate in the ROBUST consortium.

Opening of the 24/7 Energy Lab

On 14 January, the 24/7 Energy Lab was opened at a satellite event hosted by presenter Winfried Baijens. This explicitly added the innovation component to the Dies programme. The Lab is a local energy system, storing solar energy for times when the sun is not shining. The energy is stored in a battery for short-term use (e.g. overnight) and in hydrogen for longer-term use (especially to get through the winter). The opening of the lab by Frans Timmermans and Prof. Tim van der Hagen underlined TU Delft's important role in innovation and was a first step during the anniversary with which TU Delft aims to accelerate the energy transition.

Opening of the Control Room of the Future

The Control Room of the Future opened in June. This is where we are working on the increasing digitalisation of the power grid and how to deal with the resultant increased risks and cyber threats. The Control Room of the Future was built with a government contribution of €8 million.

Opening of the Wind Lab

A Wind Lab opened in July, where wind can be measured at different speeds. A huge device has been built for this purpose, consisting of all kinds of small fans that can be controlled individually. This is a unique and important set-up in the context of wind turbine efficiency.

Field labs and innovation clusters

The existing innovation clusters of field labs and physical test sites on the TU Delft Campus, where researchers, students, entrepreneurs and companies co-operate to accelerate innovation, have continued to evolve in the past year:

- **Do IoT**, the field lab for innovations concerning the internet of things, has continued to develop and there is now significant testing with 5G research facilities and the latest generation in mobile communication technology by both SMEs and the business community.
- Besides developing robot applications, **RoboHouse** focuses increasingly on the 'future of work'. The field lab works on several initiatives to answer one of the main questions surrounding the social impact of cognitive robotics: how do we make work healthy and empowering? RoboHouse is working on a renewal process under a new name: FRAIM.
- In 2022, **The Green Village** (TGV) was widely visible in the discussion on climate change, climate adaptation and the energy transition. With its wide range of projects, TGV contributes to a sustainable and circular built environment as well as the issue of heat and flooding and/or drought.
- **MONDAI House of AI** was established in 2022 to focus on connecting all stakeholders in researching and applying AI.
- The special test set up installed at **SAM|XL** in 2021. An eight-metre-long aircraft component made entirely of thermoplastic material, is used to research several new manufacturing techniques. In December, it was announced that the R&D Mobility Sectors grant scheme, in which the SAM|XL field lab and TU Delft (Faculty of Aerospace Engineering) are jointly involved, had approved three proposals. This involves total funding of €4.9 million for SAM|XL and the faculty.

Co-operation with businesses

Co-operation with companies continued to grow in 2022 based on the realisation that we cannot find the answers to major social issues on our own. Connecting entrepreneurs, knowledge institutions, investors, the government and industry ensures a breeding ground for innovation.

A good example is the growing co-operation in Netherlands in the area of optics and optical technologies. As key technologies, they form a foundation for many new technological innovations. Together with academic and industrial partners in the Netherlands, an ecosystem is created where we meet in the fields of education, research and innovation. Although the Optics Netherlands initiative has its home base in the 4TU federation, with strong industry participation from ASML and Signify, it is open to anyone in the optical community.

Several parties, such as HyET Group, McPhy and Shell, are investing millions in research into developing and scaling up the next generation of electrolyzers and enabling technologies for low-cost, green hydrogen production. In the hydrogen application area, we also see investments from Airbus, among others, in sustainable flying.

TU Delft is actively involved in applying its research and intellectual property to the development of offshore wind farms in the Dutch North Sea, thus making a visible impact on energy transition.

In the high-tech industry, ASML, NXP and Nexperia are investing in new-generation, chip-assembling machines and more specific technologies relevant to this sector.

In quantum technology, Fujitsu has positioned itself alongside Intel and Microsoft as a major player at TU Delft.

In the area of artificial intelligence, we continue to see investments from non-traditional R&D companies such as Ahold Delhaize, ING, the National Police and Booking.com, as well as an R&D-intensive company such as DSM.

Executive Education

Through executive education, TU Delft increases the innovative power of organisations by sharing knowledge. TU Delft developed an in-depth and unique Sustainability masterclass for Bain & company on five themes around energy and climate.

Developments in the TU Delft Campus ecosystem

The TU Delft Campus community, a community pioneering for change, grew strongly in 2022. TU Delft Campus is home to over 275 businesses, varying from start-ups and scale-ups to tech companies of repute. The number of people working at these companies is also growing at pace and is now around 5,000 FTEs. Together with TU Delft, other knowledge institutions and the institutes of higher education, they are working on innovations for a better society. Co-operation occurs in the various field labs and start-up hubs, among other places. In 2022, further steps were taken to turn TU Delft's ambitions into reality. Co-operation with various stakeholders such as the municipality of Delft, Innovation Quarter and the Province has intensified and there is positive contact with businesses. The campus thus becomes a powerful tool to strengthen co-operation and drive entrepreneurship – all with the aim of accelerating innovation.

For the first time since the coronavirus pandemic, a full year of community events was scheduled on campus.

Some highly visible milestones at TU Delft Campus included:

- The first phase of the scale-up building NEXT Delft has been completed, had a festive inauguration and is now fully let. NEXT Delft offers space to companies not yet located on the TU Delft Campus and facilitates the necessary progression from the various start-up hubs.
- The Quantum community is growing rapidly. Quantum Delft and quantum start-ups have moved to the new House of Quantum on Elektronicaweg.
- Field lab and start-up community RoboHouse has been remodelled to continue facilitating the growth of activities and start-ups.
- In June, Firma van Buiten officially opened its doors. Firma van Buiten is a social apprenticeship company at which several target groups distanced from the labour market are trained to become hospitality professionals. The broad campus community makes intensive use of the catering and meeting venue.

Entrepreneurship

Delft Enterprises

Delft Enterprises B.V. (DE) is TU Delft's venture capital company. It invests in start-up companies based on TU Delft knowledge in exchange for an equity interest. The investment can take the form of financial and/or non-financial contributions from DE or TU Delft, including expertise, intellectual property rights, facilities, support and/or start-up capital. As a shareholder, DE is actively involved in the start-ups. DE's philosophy is to connect innovation (promising ideas from TU Delft) to entrepreneurship (talented alumni and staff) and funding (e.g. the TechScout Venture Fund) to bring valuable knowledge from the university to market. In doing so, DE helps achieve TU Delft's impact objective.

At the end of 2022, DE held shares in 66 TU Delft spin-out companies. Many of these companies are located on or near the campus, for example in the YES!Delft incubator, RoboHouse and the Aerospace Innovation Hub. In 2022, it took an interest in eight new companies: Pholtaire, Vibrotwist, BlueGen.ai, SoundCell, Ore Energy, CyberHydra, STAND and ExCulture. These companies were established based on knowledge development from the faculties at TU Delft. Some companies are patent-based. Three exits occurred in 2022. Part of the income from these exits was returned to the relevant faculties and inventors.

The most notable exit was the acquisition of Mayht by Sonos, the US producer of consumer electronics. Mayht has developed revolutionary technology to make audio speakers more compact without sacrificing sound quality. Its CEO, Mattias Scheek, studied Industrial Design at TU Delft and founded Mayht in 2016 with his brother Timothy (CTO).

In 2022, Plotwise (last-mile delivery software) was also acquired by e-commerce company Coolblue and French investor InfraVia bought recycling company Blue Phoenix Group from the Dutch private equity investor Waterland. Delft Enterprises still had a small stake in Blue Phoenix after its earlier acquisition by Waterland (in 2015).

TU Delft Services

TU Delft Services B.V. (TDS) supports and manages the activities of TU Delft that best fit a private legal entity. The activities of these affiliated parties are either service activities for the benefit of TU Delft or valorisation activities in field labs, for example. Tax reasons, risk management and control can be decisive in TU Delft's choice to place activities in an entity under TDS. At the EB's request, TDS sets up and manages the entities with Finance and Legal Services also playing a role in the run-up to an entity. TU Delft's Executive Board supervises the implementation of TDS's policy through the TDS director. TDS entities include the proton clinic Holland PTC, which was set up together with Erasmus MC and LUMC, the incubator YES!Delft, at which EUR has been shareholder alongside the municipality of Delft and TU Delft since 2022, and, for example, the Green Village foundation. The 24/7 project also started there in January 2022. One of the field labs, the RoboValley Foundation, is working on an ambitious programme called FRAIM, focusing on the employee of the future. Work is in progress on both the submission of a gravity programme led by Prof. David Abbink, and an application for a growth fund to build several laboratories, including agtech and medtech. For these entities under TDS, no exit-policy is in place.

Of these, Holland PTC, in particular, came under relatively a lot of attention in 2022, partly because of agreements with the European Investment Bank, but also because the HPTC business case had to be reviewed. On Friday 23 December, it was announced that Holland PTC has achieved the 'Gold' standard according to Qualicor, a quality assessor for healthcare.

In the summer of 2022, the revised business case was approved, along with a refinancing plan. At the end of December, the final step of this refinancing was taken, with the guarantee fee for LUMC and Erasmus removed and new agreements reached with TU Delft. 2022 was the first year in which the estimated number of patients was achieved, with 435 patients treated over the whole year (five more than estimated). The 1,000th patient was treated in November. A new Supervisory Board takes charge from 2023.

Last year, the foundation TU Delft Innovation Campus was established; this includes several projects funded from the campus investment fund of the province of Zuid-Holland, for which a separate entity is a pre-condition.

In December 2022, the Bioprocess Pilot Facility BV was declared insolvent, a decade after the BPF was set up together with DSM and Corbion because of the need for scale-up facilities in the biotechnology sector. Although the need still exists, the BPF did not manage to gain enough market share. DSM set up another credit line in the last two years but this proved insufficient for the BPF's survival.

In 2022, TU Delft entered Geothermie Delft BV in which it holds a seat together with Shell, EBN and Aardyn/Equans. By linking scientific research and innovation to a working geothermal source on campus, TU Delft has unique research opportunities. The knowledge and experience gained will make significant contributions to the climate goals of TU Delft, the municipality of Delft and the Netherlands. Geothermal studies are also a good fit with TU Delft's primary objectives, making it a responsible use of public funds. Geothermal studies create opportunities to generate funding for earth research and sustainability, as well as for education in this field. Geothermal energy provides affordable heat.

4 People and Community



It feels like a long time ago, but most of us started 2022 working and studying from home. Even though the years before that showed that the work can continue remotely to a large degree, it had a considerable impact on the TU Delft community. Fortunately, it was soon more and more possible to start on-campus activities again early in 2022. Looking back, 2022 became the year when we were able to return and keep coming back to campus fully. We are looking for a good balance between retaining the benefits of working, co-operating and doing a degree online and being together on campus. In this way, each of us can perform to the best of our ability as individuals and together as a community.

4.1 Personnel management

Personnel changes

The table below lists the appointments made in 2022. Appointments to roles with TU-wide impact are included in this list.

Date	Name	Position
1 February	Dr. A. Groenhof	General management secretary TU Delft
1 March	Prof. E. Voûte	Pro Vice Rector for International Affairs
1 July	Prof. F. van Keulen	Dean of the Faculty of 3mE
1 September	Prof. C. Chorus	Dean of the Faculty of Industrial Design Engineering

Talent recruitment and intake

Attracting talent in a competitive labour market requires us to increasingly professionalise our scouting, recruitment and selection processes. The Recruitment Services department has therefore been built in HR in recent years. All faculties and University Services now have a Talent Acquisition Specialist who assists vacancy holders in refining the profile and developing an appropriate recruitment strategy to identify potential candidates. International talent can also use the Coming to Delft Service. Regular recruitment campaigns have continued, including a joint LDE trainee programme of Leiden University, Delft University of Technology and Erasmus University Rotterdam. Besides the Delft Technology Fellowship for talented female academics is also ready to relaunch in 2023.

TU Delft considers communication a vital component of research and the research process. This means that a basic sufficient level of English language proficiency is necessary to facilitate mutual understanding and enable supervisors and doctoral candidates to collaborate, share ideas and disseminate research results. Proof of English-language proficiency is thus an intake requirement for all doctoral candidates at TU Delft. If the candidate has a passport from certain English-speaking countries or has completed a Master's degree in English, they are exempt from taking an English proficiency test.

If a member of staff has chosen TU Delft, the university wants them to feel welcome. In addition to having a welcome card come through the letterbox on behalf of the Executive Board (EB) and being able to play a virtual game to get to know TU Delft beforehand, new staff members are also welcomed by the EB during a monthly introduction programme, followed by an integrity workshop and a campus tour. Within three months of starting, new staff members can attend an intercultural communication workshop and a network meeting is organised to get to know various TU Delft networks and organisations, such as TRUE-U

(LGBTQ+ network), the Works Council, Prometheus (staff association) and DEWIS (network of female academics). Finally, staff can follow a self-paced online onboarding programme through the Learning Hub, a digital place where employees can find and go through all the development opportunities. This programme supports staff from day one through the first hundred days.

This year, TU Delft has again taken the initiative to continue embedding Diversity & Inclusion (D&I) knowledge and awareness in procedures, processes and behaviours, and to raise awareness of this policy. D&I training courses in 'inclusive' and 'bias-free' selection and 'inclusive' job advertisements have been made available for appointment committees. Job advertisements also emphasise our openness to diversity and the importance we attach to inclusiveness. This is TU Delft's way of showing that everyone is welcome and valued.

Talent development and sustainable employability

Talent development is how an organisation manages existing talent and provides opportunities for development. In the 2022 Result & Development (R&D) cycle, the aim is for meetings to have a greater focus on the future and on development. A new scheme was agreed in 2022, to come into effect in 2023, with a stronger focus on sustainable employability and development, and an even stronger emphasis on future dialogue. Another important change is that current assessment ratings will no longer be assigned as a mark.

In the Recognition & Rewards policy, which is in line with the position paper *Ruimte voor ieders talent* (Room for everyone's talent) published by the Association of Universities in the Netherlands (VSNU) in November 2019, the essence within TU Delft is the possibility of diversifying career paths in addition to focusing on research. TU Delft continues to focus even more on team science. This has resulted in a Postdoc Development Framework and the Academic Career Track policy, an innovation of the Personal Development Programme for Tenure Trackers. A TU Delft Leadership Dialogue game – a card game to engage in a conversation about leadership – has also been introduced. And as part of making room for everyone's talent, a podcast series called Adventures in Teaching has been launched. It highlights the successes and challenges of the teaching side of an academic career.

One of the aims of sustainable employability is to keep staff healthy, energetic and productive. Staff can participate in a vitality programme that guides and coaches them to improve their health, resilience and performance. In addition to this programme, staff could also participate in targeted theme or inspiration sessions or other vitality workshops throughout the year. The EB also decided to organise several weeks with a limited amount of emails and meetings. During those weeks, colleagues send fewer emails to each other and no meetings are held in principle. The aim is to relieve work pressure.

Work is important for people. Besides financial independence, it gives structure to their day, development opportunities and social contacts. This applies to everyone, including those with a disadvantaged position on the job market. Placing this target group at TU Delft is not an automatic process. A project organisation oversees placements and provides peer-to-peer learning and workshops for buddies and supervisors. Responding to the developments, the EB adopted a resolution for central funding until retirement date. A communication campaign was launched in October to increase publicity and awareness.

A safe and challenging work environment

TU Delft's position is to be a campus university, where people can come together in person, planned and spontaneously. This provides inspiration, promotes the student learning process, enhances collaboration, creates important networks and boosts our sense of well-being. Many of our activities are also campus-based, such as laboratory work, hospitality and security. But as the COVID-19 pandemic showed staff the advantages of working from home, TU Delft has now moved to a hybrid working situation, in which the campus serves as a place for interaction. Hybrid working resulted in the Hybrid Working Scheme, as part of TU Delft's Hybrid Working Policy, this year. An important aspect of this scheme is that the supervisor and employee make arrangements for working on campus (minimum 60% of the time) and remotely (maximum 40% of the time), for example from home. As this is a new situation for all of us, all TU Delft staff are on a voyage of discovery to find out what works and what doesn't.

An occupational health and safety management system is essential in a safe working environment. The multi-year Occupational Health & Safety Management System/Risk Inventory & Evaluation (OHSS | RI&E) improvement programme was set up this year. Quick wins and structural and well-founded improvements were both initiated simultaneously. The visible quick wins achieved so far in 2022 are centralised and decentralised HSE (Health Safety & Environment) 2021 annual reports, a clear method for HSE to analyse and report incidents and the introduction programme for prevention officers, held for the second time. As for structural improvements, most faculties will complete their RI&E system in 2022 and the corporate RI&E has been launched with completion scheduled for the first quarter in 2023.

Efficient HR support

Since 1 January 2022, TU Delft has been working with a new HR system, MyHR, a digital system for personnel administration, payroll processing and other services. Staff can view and manage many HR matters in this system themselves. Supervisors can make requests for staff themselves or with an MyHR Assistant. In addition to supporting users, resolving operational issues, addressing findings and optimising existing processes, work has begun on analysing which other HR systems should be integrated with MyHR.

Moreover, The Learning Hub has also been launched. The Learning Hub allows staff to work on their own development in a way that suits them, not only through training sessions but also through e-learning, MOOCS (Massive Open Online Courses) and articles. It contains the development opportunities on offer from various TU Delft providers.

Integrity and Diversity & Inclusion

Integrity Officer and Integrity Office

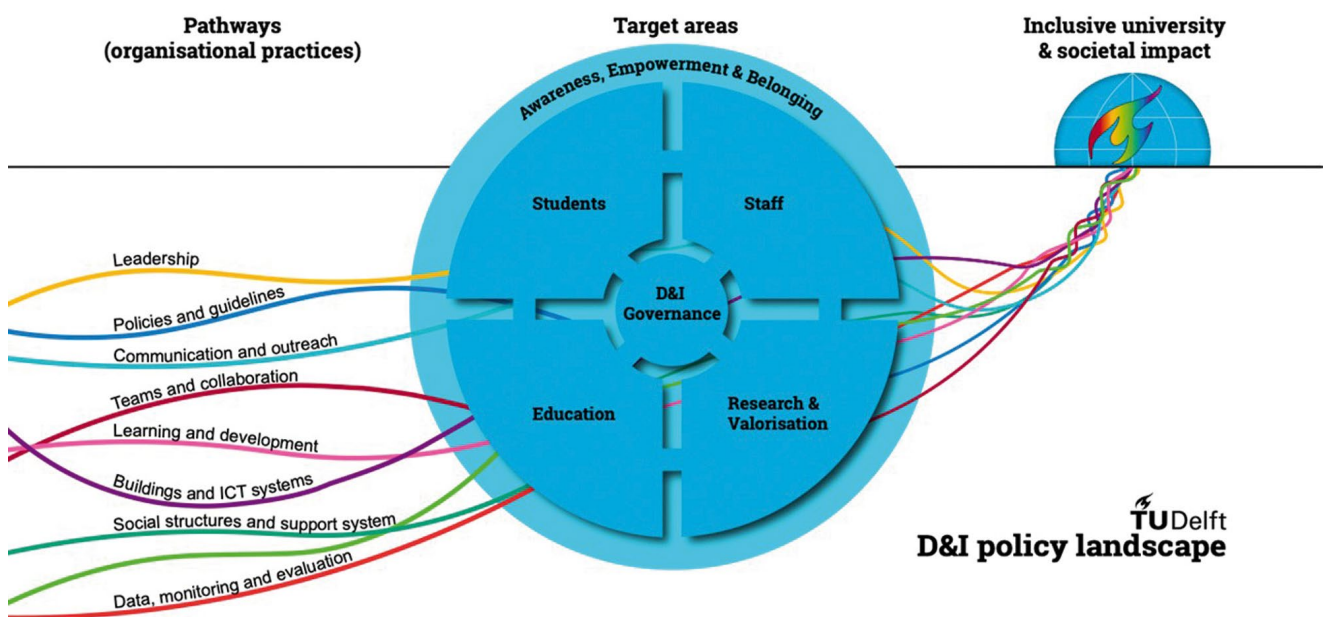
Issues of scientific, organisational and social integrity have been addressed. As for academic integrity, there is increasing demand for research ethics courses. Increasing attention is also being paid to how the pursuit of openness, for example of research data, can conflict with the protection of test subjects or the security of knowledge. As for organisational integrity, the integrity infrastructure has been strengthened in several ways. Two ombuds officers have taken up their role and efforts have been made to better assist the confidential advisers. The focus on knowledge security and international co-operation is growing: a pilot study at the Faculty of Electrical Engineering, Mathematics and Computer Science (EEMCS)

was conducted with moral deliberation that will lead to new policy proposals. As for social integrity, the main focus last year was on social safety. Contributions were made to preventive measures such as a positive work and study climate. Confidential work in the student associations has also been supported, for example through easily accessible training courses.

Diversity and inclusion

In 2022, the Diversity & Inclusion (D&I) office strengthened the team and network in the organisation. The office also started setting out a strategic line and laid a foundation for the D&I infrastructure. This strategic line is visually represented in a 'landscape' with six target areas (see figure 4.1). Steps have been taken for all these areas as part of a holistic and integrated approach to achieve an inclusive work and study environment and to increase diversity in the TU Delft community.

A brief summary of strategic activities in 2022: Faculty Diversities Officers (FDOs) have been inaugurated and created D&I teams in the faculties. A revised D&I statement has been developed and awareness-raising workshops have been organised. An action plan was drawn up with HR to achieve an integrated D&I approach at central and faculty level. Specific decisions have also been taken regarding additional reflection rooms and all-gender toilets. To encourage student involvement, the D&I grant has also been launched, allowing students to submit ideas for inclusive education and a diverse and inclusive study environment. Finally, Gendered and Inclusive Research and Innovation (GIRI) was established as one of TU Delft's strategic priorities in April 2022.



4.2 Community

Alumni

The alumni community consists of more than 110,000 Delft engineers with an MSc, PhD or PDEng degree, as well as retired professors. Through a variety of online channels, alumni are kept informed about TU Delft research and the latest news and activities for, by and involving them.

New TU Delft community magazine Delft Matters

June saw the launch of the first edition of Delft Matters (the new name for Delft Integral/Outlook). Previously aimed at alumni only, the magazine has not only been given a new name but has also been redesigned to include Masters students and academic staff among its target audience – an important communication tool to foster a sense of pride in the TU Delft community.

Alumni activities

In 2022, 2,257 alumni participated in various activities, such as the online Energy Transition Talks, events in co-operation with companies such as NS and Eneco, events organised by alumni themselves abroad, and reunion events. The TU Delft for Life | Xperience Day also took place on 9 June. Alumni, University Fund contacts, academics and the new generation of engineers came together on campus. The Alumnus of the Year 2022 was announced on this day: *ir Jan-Maarten Geertman, an alumnus of the Faculty of Applied Sciences (AS)*.

Alumni involvement in TU Delft

Over four hundred alumni have volunteered at TU Delft and stayed connected by sharing their knowledge, time and/or network. They have acted as coaches or mentors to students and recent graduates. Alumni have also provided feedback on their degree programme and its relevance to the labour market by way of input for assessment visits.

Delft University Fund

Tech for Energy | speeding up the energy transition together

On Dies Natalis (Foundation Day), the University Fund launched the annual Tech for Energy campaign, which focuses on Delft research and TU Delft's ambition to be at the forefront of the energy transition. Alumni were invited to meet the academics behind this research and contribute towards their important work. And that is exactly what they did, raising a total of €227,868. The proceeds will contribute to three anniversary labs: the 24/7 Energy Lab, the Floating Renewables Lab and the Control Room of the Future.

Prof. Kees Vuik receives the Professor of Excellence Award for 2022

On 5 September, the Professor of Excellence Award for 2022 was presented to Prof. Kees Vuik, professor of Numerical Analysis at the Faculty of Electrical Engineering, Mathematics and Computer Science (EEMCS). Kees Vuik has published extensively and his work is widely cited. As director of the TU Delft Institute of Computational Science and Engineering (DCSE), he has also worked tirelessly at the Delft High Performance Computing (DHPC) facility in recent years. Kees Vuik has also supervised almost two hundred MSc/BSc students and more than 40 doctoral candidates.

Graduate Entrepreneur Fund raises €56 million for an early stage fund

Graduate Entrepreneur is an initiative of a group of successful alumni from Erasmus University Rotterdam, Erasmus MC and TU Delft and a student team from Delft and Rotterdam. In addition to funding, the alumni offer coaching and access to an extensive network. Graduate Entrepreneur consists of a Pre-seed and a Seed Fund that now totals €56 million. This money will be used to invest in the pre-seed, seed and series-A phase of

start-ups by founders who are studying or working in Delft or Rotterdam now or have done so previously. The University Fund and Erasmus Trust Fund raise donations for the benefit of the Pre-seed Fund.

TU Delft Excellence Fund has over €4 million in donation pledges

The TU Delft Excellence Fund was established in 2019 to support TU Delft's excellence strategy. Prof. Sebastian Geiger is the fifth top scientist to come to TU Delft with help from the Excellence Fund. As a leading scientist in the field of sustainable geo-energy technology, Geiger plays a prominent role in energy transition. With the help of the Excellence Fund, he plans to develop the GEoscience Twin for SubSurface Energy Lab (GETTSS Energy lab).

TU Delft Best Graduate Award 2022 presented to Saskia van Heumen

On 22 November, TU Delft's eight best graduates presented their final theses at the TU Delft Best Graduate Award Ceremony 2022. The prestigious title of TU Delft Best Graduate 2022 was awarded to *ir* Saskia van Heumen, graduate of the Faculty of Mechanical, Maritime and Materials Engineering (3mE). Saskia developed a method to accurately image lymphatic vessels in patients.

Local involvement (and Student&City)

Since 2017, TU Delft has participated in City Deal Kennis Maken (CDKM) Delft with its partners the municipality of Delft, The Hague University of Applied Sciences and InHolland. Closely related to this is the pillar of 'the connection between the university community, city and residents' of the 2016 covenant between TU Delft and the municipality of Delft, designed to strengthen co-operation. The WIJStad programme brings these efforts together. Over the past five years, these programmes have worked with lecturers and students to achieve both academic results and results that benefit the city of Delft and its residents.

CDKM Delft works to solve social and urban issues by lecturers and students. In this way, the city becomes an interesting learning environment where the municipality and residents can tap into the knowledge and expertise of the knowledge institutions, and where students can demonstrate their added value to society by working together on location-specific issues, thus contributing to a better image of students in the city.

The project proposal *Buiten de bubbel: opschaling van stedelijke kennisvragen in ons onderwijs* (Beyond the bubble: upscaling urban issues in our education system) received a grant through the Taskforce for Applied Research SIA. Over the past year, we have explored the types of education that are best suited to addressing these kinds of urban issues. An implementation plan has been delivered for urban issues in the curriculum; this is also the impetus for the new grant application to the Taskforce for Applied Research SIA: *Denken en doen in co-creatie* (Thinking and doing in co-creation).

WIJStad collaborated in the SWAT-Studio subject. In this subject, students doing a Master's degree in Building Technology were paired with local organisations from Delft's Buitenhof district to work together on social issues. This made the importance of a lasting connection with residents even more of a project priority. An initiative called the *Blikopeners* was also launched. During these sessions, local experts (residents) give an informative view of their neighbourhood during a guided tour. The first edition of *Delft Draait Door* also took place, focusing on giving back and exchanging knowledge with local partners through panel discussions.

The book *Van Vak Naar Vraagstuk* was launched as a talking piece, outlining ten prerequisites for using an issue in education. This is a conversation starter for both internal and external ('From Issue To Subject') implementation and network consolidation.

Last year, the City Deal network in Delft jointly appointed two knowledge brokers for one day a week. They identify urban issues and coordinate the challenges.

The third edition of Meet the Professor took place during Dies Natalis (Foundation Day), with 36 professors giving a guest lecture to more than 1,000 pupils from group 7 and 8 of Delft primary schools.

On 1 June, Prof. Rob Mudde (Vice Rector Magnificus/Vice President of Education) relinquished his chair to a student from the pre-vocational secondary schools in Delft, as part of JINC *Baas van Morgen* (Boss of Tomorrow). WIJStad partners with JINC to combat educational inequality. Besides the Boss of Tomorrow initiative, JINC joined groups of students at various faculties of TU Delft for 'Lightning Internships'. Here, pre-vocational secondary school pupils discover how engineering and working at university can fit their profile.

TU Delft actively contributes to The Hague South-West Thesis Workshop. This is an educational platform where various Master's students from Leiden University, TU Delft and Erasmus Rotterdam carry out thesis research from various disciplines on practical challenges formulated by various social stakeholders in the south-west district of The Hague.

4.3 Administrative co-operation

Regional Co-operation

Co-operating with the municipality of Delft

Co-operation with the municipality of Delft continued unabated in 2022. The cooperation was organised around four topics; space, knowledge and economy, university community, city and residents, and public affairs. Based on these topics, we worked on tasks relevant to the entire ecosystem around TU Delft: from improving accessibility, to good programming on the TU Delft campus, to connecting with the different neighbourhoods. The growth of the innovation ecosystem around TU Delft requires developing and improving the residential, working and living environment for all Delft residents. In 2022, TU Delft supported the municipality both substantively and administratively in defining what is needed for the city to grow in all aspects. A joint effort was made to bring this broad challenge to the attention of public stakeholders and create support.

Convergence

As discussed in Chapter 3 (see page 35), TU Delft, Erasmus MC and Erasmus University Rotterdam have co-operated administratively since 2019 under the Convergence programme. Besides substantive progress in research, the three Convergence institutions have also grown closer to each other in operations. Working groups with representatives from the three institutions, set up to remove obstacles to smooth cooperation (including in the areas of finance, legal and public affairs), are now fully up and running and facilitating operational convergence. In addition, new initiatives have been launched to better inform

both internal and external stakeholders about what is happening in Convergence. A brainstorming day was also organised with the full boards of the three institutions on the next step for Convergence: setting a working agenda for the foundation phase and moving towards School(s) of Convergence.

Leiden-Delft-Erasmus Universities (LDE)

In 2022, a committee led by former Dutch Research Council (NWO) chair Stan Gielen evaluated the LDE Centres and the LDE PortCitiesFutures programme. Briefly put, the committee is impressed by the positive energy, commitment and enthusiasm of the centre's staff and by the unique and vital role the centres play in bringing about innovative inter- and multidisciplinary co-operation in research and education. The centres are thus best characterised as catalysts and incubators. Inter-university research seems to be well received in faculties through LDE mid-career researchers with tenure.

A new programme is LDE Global: Research and Education with the Majority World. LDE universities are keen to be relevant to society, as well as globally. A federation of several existing initiatives (TU Delft Global, LUMC Global, LDE Centre for Frugal Innovation, Regiobeleid Leiden, Regiobeleid Delft, ISS, IHS, Afrika Studiecentrum and Rotterdam Global Health Initiative) has been created in the process. An example of a related activity is the Academy that LDE held with the national science organisation BRIN on the Smart, Sustainable and Healthy City in Post COVID-19 Indonesia. Outcomes of this Academy will be published in 2023.

In 2022, LDE celebrated its tenth anniversary under the slogan 'The next ten years'. During the year, smaller and larger events were organised with the co-operation of administrators, centres and students, including two meetings dedicated to 'dual appointments' – five professors received a second appointment at another university in the Leiden-Delft-Erasmus framework. Chapter 3 discusses the LDE's research activities in more detail (see page 36).

Economic Board Zuid-Holland

TU Delft is an active partner in the Economic Board Zuid-Holland (EBZ). Private and public players in Zuid-Holland want to take the region and thus the Netherlands to a structurally higher growth path. This achieves sustainable broad prosperity and well-being for the Netherlands in a changing world. The EBZ creates support and mobilises capacity for the major transitions the economy is facing.

Work was carried out in 2022 to achieve the Zuid-Holland Regional Growth Agenda, drawn up in 2021. The Regional Growth Agenda is an ambitious action and investment agenda, based on which over the coming decade key players in Zuid-Holland, some eighty government bodies, businesses and knowledge institutions, will be investing €1.4 billion each year in the regional economy, in knowledge and innovation, the manufacturing industry, energy infrastructure, accessibility and human capital. The region uses this to combat the effects of the COVID-19 pandemic, high unemployment and sluggish economic growth in the region. The Growth Agenda priorities have been reviewed in the light of recent international developments, such as soaring inflation and the energy shortage caused by the war in Ukraine.

Results in 2022 include the allocation of money from the second round of the National Growth Fund to many projects involving Zuid-Holland companies and knowledge institutions.

These include green hydrogen and green chemistry ecosystem projects (GreenPower), sustainable aviation (Aviation in Transition) and photonic chips (Photondelta). Another result is the allocation of money for improving infrastructure in Zuid-Holland to enable ambitious housing construction goals in the Growth Agenda.

National Cooperation

4TU.Federation

The 4TU.Federation is the partnership of the four universities of technology in Delft, Eindhoven, Enschede and Wageningen. The 4TU.Federation aims to bundle, strengthen and maximise use of knowledge and creativity in the technology sector. The 4TU.Federation has appointed Prof. Vinod Subramaniam (University of Twente) as its new chair as from 8 March.

The 4TU.Federation supports nine thematic network centres. Besides the five High Tech for a Sustainable Future (HTSF) programmes coming to an end, four new programmes aimed at attracting new talent and achieving scientific breakthroughs were accepted last year.

There is also co-operation in the area of engineering education in the 4TU.Centre for Engineering Education. The 20 post-Master's designer training courses are offered through the 4TU.Stan Ackermans Institute.

Finally, the 4TU.Federation has articulated its knowledge transfer ambitions in the 4TU Impact Plan, which consists of four modules: Co-operating with industry, Living Labs, Business Development, & Entrepreneurship and Start-up Funding.

International Co-operation

Pro Vice Rector for International Affairs

The EB has appointed Prof. Ena Voûte, former dean of Industrial Design Engineering as Pro Vice Rector for International Affairs as from 1 March 2022. A strategic vision needs to be developed of the challenges ahead in the international arena, such as current geopolitical developments, the security of knowledge, the growing global demand for higher education, the attraction and retention of academic talent, the strengthening of international strategic university partnerships and relations with the international business community. Maintaining vital political-administrative networks in Brussels and The Hague is also a must. Voûte will represent TU Delft in the broad network of international relations, including in CESAER and Enhance, as well as in various other international aspects such as incoming and outgoing administrative delegations, conferences, alumni relations, and so forth.

International university networks

Besides regional and national co-operation, TU Delft also actively seeks co-operation with European partners. For example, TU Delft is an active member of several European university networks. The IDEA League is a strategic partnership between five leading European universities of technology: TU Delft, RWTH Aachen, ETH Zurich, Chalmers University and Politecnico di Milano. Prof. Tim van der Hagen (Rector Magnificus/EB President) currently chairs the IDEA League.

TU Delft is also a member of the European Universities Association (EUA). As one of the founding members, TU Delft is an active member of the Conference of European Schools for Advanced Engineering Education and Research (CESAER), a European non-profit association of more than 50 leading European universities of technology and institutes of higher education from 26 European countries. In addition, TU Delft is an active member of the European Society for Engineering Education (SEFI), the largest network of institutions of technical education in Europe.

ENHANCE

TU Delft joined ENHANCE, a European University Initiative, part of the ERASMUS+ programme, in November 2022. The long-term strategy of cross-border associations between European universities is to promote the empowerment of a new generation of European citizens by encouraging student and staff mobility, and to contribute to the quality, inclusiveness and competitiveness of European higher education. Components of this include encouraging innovative forms of learning and ensuring societal engagement.

ENHANCE's mission is to bring about responsible social changes and to promote the development and use of science and technology for the benefit of society. Ten universities have joined the Alliance: Technische Universität Berlin (Germany), Chalmers University of Technology (Sweden), TU Delft (the Netherlands), ETH Zurich (Switzerland), Gdańsk University of Technology (Poland), Norwegian University of Science and Technology (Norway), Politecnico di Milano (Italy), RWTH Aachen University (Germany), Universitat Politècnica de València (Spain) and Warsaw University of Technology (Poland).

5 Campus and Services



The TU Delft Campus provides space for the university's core activities: teaching, research and valorisation. The campus also provides a place to live and a location for businesses and institutions. Above all, the campus is a pleasant space to be for all campus users and all residents of the municipality of Delft – a space for social gathering and personal development. The university, and with it the campus, is constantly evolving. This can also be seen on a daily basis by the many students, staff and other users of the campus who make intensive use of all its facilities.

Coronavirus

Coronavirus and the related measures had an undeniable impact on students and staff from 2020 to 2022: continuity of teaching was under pressure, the lack of physical encounters led to psychological distress among large groups of students and staff, and the changing measures created tensions in terms of implementation and compliance. But the past period has also shown the importance and added value of meeting, co-operating and teaching on campus.

During several periods of 2020 and 2021, restrictive measures affected the campus and campus activities, including a curfew, intelligent lockdown, the closure of hospitality venues, outdoor cafés and shops, the instruction to work from home, the 1.5 m social-distancing rule, walking routes, wearing masks, ventilation measures, restrictions on indoor and outdoor sports, the closure of museums, maximum group sizes and self-testing.

Although 2021 ended with lockdown measures it was possible to offer more face-to-face teaching again from 17 January 2022. The COVID-19 measures were eased in several steps: no more maximum teaching group sizes, no obligation to wear masks, no coronavirus access control, abandoning the mandatory 1.5 metre social distancing, no more homeworking recommendations until also abandoning the recommendation to spend a maximum of 50% of the working week at the office. Despite the COVID-19 measures being abandoned in 2022, the virus itself has not disappeared. The basic recommendations remained: wash your hands frequently, keep your distance, get plenty of fresh air, cough and sneeze into your elbow, stay at home if you have symptoms, get a vaccine or booster shot, and self-test.

From a campus services perspective, the entire coronavirus period was an enormous operation. Around 15,000 stickers were placed in all TU Delft buildings, for example, to indicate walking routes. Additionally, 3,000 portable half-litre bottles of hand sanitiser were distributed across the campus and 260 additional hand sanitiser dispensers were installed. Finally, 4,000 spray bottles ($\frac{3}{4}$ litre) and 2,000 packs of disinfectant wipes were distributed across the campus. Under the direction of the TU Delft Relaunch and Restart Coordination Team, the Complex Management and Facilities Task Force advised on implementing the announced measures and gave direction on organising a safe campus and buildings. After the COVID-19 measures were almost completely scaled down, the Executive Board (EB) decided in April to discharge the Central Coronavirus Crisis Team, the Relaunch and Restart Task Forces and the associated Coordination Team. The structure of the Task Forces proved to be powerful and effective during the COVID-19 period. Two task forces – Educational Quality and Design and Complex Management and Facilities – will once again be on stand-by mode and will deal with any increase of infections and uncertainty about the development of the virus.

In April 2022, as part of the long-term COVID-19 approach, the Minister of Education, Culture and Science drew up four scenarios for which the education sector can prepare.

Based on the Coronavirus Sector Plan – by the Ministry of Education, Culture and Science, the Senior Secondary Vocational Education Council (MBO Council), the Association of Institutes of Higher Education, the Universities of the Netherlands and the Dutch National Student Association (ISO) – all educational institutions prepared their own detailed plan, to make their own decisions about which measures to implement within the given frameworks. At TU Delft, this led to the Medium-Term Coronavirus Strategy. The strategy was discussed with the Student Council and the Works Council on 20 October 2022, after which the Executive Board adopted it on 1 November 2022. The Strategy distinguishes four scenarios for the course of the coronavirus pandemic and provides a framework for implementing preventive and other measures.

5.1 Campus development

Delft Campus Vision 2040

TU Delft's campus plays a crucial role in educating and training our students, while providing an attractive working environment for our staff. Around 250 companies and institutions are also located on the campus. Pioneering scientific research, excellent education and innovative co-operation with businesses all come together in this inspiring and challenging environment with top-class facilities. It is moreover a place where our community, visitors and local residents meet. In 2022, a process was launched leading to a Delft Campus Vision 2040; a vision with 2040 as its horizon. As the campus is constantly evolving, this Delft Campus Vision 2040 must become the strategic compass for developing and redeveloping the campus in the coming years. Through the campus, we help to implement TU Delft's strategic agenda: solving global challenges and pushing the boundaries of technical sciences. In this way, we can also continue to provide that inspiring and challenging environment in the future. Making an impact for a better society.

Campus strategy

TU Delft aims to continuously develop the university campus, providing space for world-class facilities for the core activities of teaching, research and valorisation. This includes educating, meeting and developing students, academics, staff and business partners. The number of students continues to rise along with the pressures on both the campus and city. Against this challenging backdrop, the Campus Strategy provides a financial framework and principles for on-campus developments over the next 10 to 30 years. The Campus Strategy is regularly updated.

The North, Central and South sub-areas of the campus have different development typologies. The northern part is being examined for possible future rezoning, the central part offers space for increased building density and the southern part for new-build developments. This is how the campus of the future is being built.

In 2022, the Campus Board – consisting of deans and directors and chaired by the Vice President of Operations (VPO) – has become an important coordinator of TU Delft's campus developments. As a result, the Executive Board has expanded the financial framework of the Campus Strategy, taking into account the core activities, growth rates and sustainability objectives. In the context of hybrid working and teaching, the changing space needs of users are being further explored, with the aim of making the most efficient use of facilities. The newly developed Smart Campus programme will play a key role in further implementation.

In implementing the Campus Strategy investment programme, the University is facing challenging market developments because of the COVID-19 pandemic and disrupted production and transport chains. The war in Ukraine is also significantly affecting market developments. As a result of these events, there are equipment, materials and staff shortages, as well as rising energy prices and inflation.

Regulated parking

To maintain smooth and safe accessibility to the campus, parking regulations are being developed for the campus. Parking regulations will ensure that the parking spaces at central locations on campus remain available to staff, students, visitors and the companies and institutions on campus. The parking policy was fleshed out in 2022 based on the previously established principles. The necessary infrastructure has also largely been built to install and operate the system in 2023.

Hybrid working

An integrated policy on hybrid working has been outlined following the experience of the COVID-19 pandemic. Developing this policy involved intensive co-operation from various disciplines. This involved looking at best practices at other large organisations and holding various interviews and discussions with staff and management to find a desirable and practical arrangement for TU Delft.

Several hybrid-working pilot projects are being carried out in cooperation between HR, CREFM, ICT and Communication and with the participating locations. A first visible pilot project is placing phone booths across all buildings on campus. Two buildings (23 and 34) also have pilot projects focused on layout and structural changes. And, in one building, a pilot project focuses purely on the furniture. The first evaluation results will be discussed in mid-2023.

New Echo Teaching Building

In May, the sustainable, inter-faculty Echo teaching building opened its doors to lecturers and students. The opening generated a great deal of publicity in various media. Echo facilitates the space requirements of the growing student population, combined with the need for larger but more flexible teaching spaces. Echo has a total of seven teaching rooms, most of which will have a flexible layout. For example, the largest lecture hall with seven hundred seats can be divided into three separate rooms. Group work and self-study is possible in the more than three hundred study spaces. Besides providing additional educational facilities, the building is also a pleasant place to meet. Longer opening hours and good catering facilities with various seating areas contribute to this.

Echo will contribute to TU Delft's sustainability ambitions to operate on a fully sustainable basis by 2030. The building is energy-generating, including user-related energy consumption, such as for laptops, lighting and food & beverage facilities.

Completion of the Stevin area

In May, we celebrated the completion of the redeveloped Stevin area with the relevant contractors, internal parties and users, among others. This area, together with the Echo teaching building, is now an attractive place to spend time and to meet people. The Stevin area has been redeveloped with the aim of creating a vibrant and attractive area. For

example, the underground cables, pipes and sewers were replaced in 2021. The pond at the front of the Bouwcampus has been completed and the greenery has created a pleasant place to stay. A connection to the visual appeal of Mekel Park has been made with the use of distinctive and durable paving materials, among other features. The disappearance of the parking spaces leaves much more room for greenery in the entire Stevin area through new trees and planting beds. And what is known as a wadi has been formed; a place where water is collected. The redesign has created an attractive outdoor space. Both Stevinplein and the Berlageplantsoen are places where students can study outside, work on research or simply enjoy the sun.

Firma van Buiten opened

Firma van Buiten's new location on the south of the TU Delft campus was opened on 9 June. Firma van Buiten is a social work training company. This means that several target groups distanced from the labour market are trained to become hospitality professionals. The social enterprise was able to move into its own circular and demountable premises because of contributions from TU Delft. This catering facility will make the southern part of the campus livelier, while also contributing to campus biodiversity. For example, a bee hotel was installed when the outdoor space was landscaped. This plot is also part of a butterfly route designed by Architecture and the Built Environment students. Both the building and parts of the exterior are circular. For example, old paving material from TU Delft – including from the Stevin area – has been reused for the layout of the public space.

Opening of NEXT Delft

On 29 September, the NEXT Delft accelerator building on TU Delft Campus was officially opened in the presence of administrative representatives of the municipality of Delft, province of Zuid Holland and ASR Dutch Science Park Fund, NEXT Delft's owner, among others. The NEXT Delft accelerator building on TU Delft Campus offers office and production space to around ten innovative companies and was almost fully let shortly after its opening. NEXT Delft is the place to be for high-impact businesses from across the region, as well as those that have outgrown the start-up phase and want to continue growing. By settling in NEXT Delft, they remain part of the community and the innovation ecosystem on and around TU Delft Campus.

Signing the implementation agreement for tram line 19

On 14 June, TU Delft, Metropolitan Region of Rotterdam and The Hague (MRDH) and municipality of Delft signed an agreement to build a new tram track across the campus. So as not to disturb research, more far-reaching measures are needed to minimise electromagnetic fields and to dampen the vibrations generated by the tram ride. For that purpose, the existing tram track must be dug up and reinstalled in part. Academics from the AS, CEG and EEMCS faculties were involved, which helped lead to the application of an innovative electromagnetic field reduction system with a TU Delft patent. In addition to the implementation agreement, the parties signed a covenant for long-term co-operation on the accessibility of the southern part of the campus.

TU Delft | The Hague accommodation

TU Delft wants to use its technological knowledge for making social impact. An integral part of TU Delft's social impact strategy is for the university to bring cutting-edge engineering knowledge closer to the world of politicians, advisers, policymakers and executive officials

in The Hague, contributing to more knowledge, better policymaking and more efficient implementation. To achieve this, we want to have a strong presence on the campus in The Hague and develop it as a vibrant and inspiring place for our students, researchers and other staff to study, meet and share knowledge.

The new location in New Babylon located next to The Hague Central Station will be occupied by the TPM faculty, more specifically the TU Delft | The Hague programme. The three focus themes of the TU Delft | The Hague programme are: (1) Climate & Energy, (2) Safety & Security, and (3) Digitalisation. The location will finally open its doors in January 2023.

Investment decision on underground infrastructure and above-ground facilities on Campus South

A key development in the campus strategy is the continued development of TU Delft Campus South, specifically the Kluyver area. Besides several new construction projects, new underground and above-ground facilities and infrastructure are required in this 24-hectare area for drinking water, sewerage, electricity, data cabling and telephone services. Roads, cycle and walking paths, seating areas and a park-like setting will also be created. Seasonal thermal energy storage (STES) plants will also be built in the area to heat the new buildings in winter and cool them in summer. After the Works Council and Student Council gave a positive recommendation, the EB approved the necessary investments. The various works will be completed in phases from 2022 to 2027. The result: a new campus area where sustainability and biodiversity have a visible place.

New building for Logistics and the Environment

Preparations for the new Logistics and Environment building are well underway. Meanwhile, the contractor and various technical parties have been selected. Construction will start in early 2023. Completion of the new central hub for specialist fabrics is scheduled for the start of 2024. The new Logistics and Environment building will have a green and open feel to it. When it comes to sustainability, the bar is high. Besides employee well-being and minimising the effect of CO₂, circularity plays a key role in developing a future-proof, inspiring and vibrant campus.

New Physics building

The new Physics building is also part of the area development on TU Delft Campus South. This new building houses the Faculty of Applied Sciences departments still located in building 22. In addition to state-of-the-art laboratories and teaching facilities, it will also have a future-proof office environment. Students, researchers, lecturers, support staff and business visitors will all use the new building. The EB adopted the final investment resolution on 18 January 2022. To the south of the Campus, AS departments are already housed in buildings 50, 58 and 67. With the construction of the new Physics building, the entire AS faculty will be located in the southern part of the Campus.

Preparations for the new QuTech and General Teaching Building South

Preparations for the new QuTech building and General Teaching Building South are also well underway. In future, QuTech will be housed in a new building on the southern part of the TU Delft campus. The official kick-off was on 29 August. The kick-off, which marked the start of the design process, was attended by the architect, structural engineer, QuTech, university

departments, and others. The sketch design of the new building is expected to be unveiled in the first quarter of 2023. The festive kick-off for the General Teaching Building South was held on 20 December with the design team. Maximum ease of its use – education – is central to this development. Besides teaching spaces and study areas, the building will also have catering and support facilities so that it can soon become the meeting place for the TU Delft community on the south of the campus. A first draft is expected in Q3 2023, based on further detailing, and an investment proposal can then be submitted to the EB.

Flux: new inter-faculty teaching building

Construction of Flux, a temporary inter-faculty teaching building, started in the centre of the campus in November 2022. The building can accommodate more than 750 students. There will be four large, ground-level lecture halls for mixed teaching, which can also be used for exams. Several meeting places will be created in the central hall.

The extra teaching space is needed to accommodate the continued and rapid growth in the number of students. Flux is expected to be at this location for five to ten years. This gives TU Delft the time, space and flexibility to properly monitor the size of the student population, developments in education following COVID-19 and in the area of blended learning. It therefore opted for a demountable building. The building will be equipped with LED lighting and solar panels. The interior uses circular (i.e. repurposed) flooring, previously used at the 2012 London Olympics, among other venues. Flux will be furnished as much as possible using refurbished furniture, partly from TU Delft's own stock. Because the building is demountable, it can be rebuilt and reused in another location in the future, if necessary. Flux is expected to open its doors in the third quarter of 2023.

Safety

Safety is undeniably a top priority at TU Delft. Safety affects work, students and staff, and the environment, both physical and otherwise. Many spatial projects are planned from the Campus Strategy investment programme. These projects and developments take place during the primary process and can be a source of safety risks. In 2022, CREFM launched a structured programme focused on safety. Ultimately, the aim is to create a safe environment in which to work, study and live on campus. The Safety programme has brought visible attention to the theme, including a campaign around National Safety Awareness Day on 30 March 2022 and Safety Week from 10 to 14 October 2022. In addition to the campaigns, efforts have been made towards a sustained focus on safety in the organisation. This involves close cooperation by all internal and external parties involved. The focus on this issue will be continued in the coming years, including by continuing to raise awareness of how to avoid risky situations.

Art policy 2022

TU Delft has a modern and contemporary art collection, the core of which are permanent fixtures on the campus grounds. With a dedicated art budget and a long-term vision of 'Living Art, Living Campus', the art collection curator and the Artworks on Campus working group work together to create a vibrant and cohesive collection that challenges users to expand their horizons. The existing collection was reactivated in 2022 by restoring some of the top pieces in the collection and organising several well-attended Art Walking Tours. Restorations of current works are expected to be completed by the end of 2024, ensuring that all existing artworks on campus are ready for the future. In June, for example, the Karel Appel wall mosaic was restored at 3mE, enabling faculty users to realise just how special

our art collection really is. Preparations have also started for a new artwork in the pond near Landbergstraat on campus. Both existing and future artworks contribute to a vibrant campus where people meet, collaborate and develop in TU Delft's Campus Vision 2040 (under development).

5.2 Sustainability

TU Delft has continued to work on its sustainability ambition in the past year. The three major areas of focus concern a) raising awareness and strengthening commitment, b) generating an overview and understanding of progress through clear governance and structure of the programme, and c) supporting the ambition with financial resources.

Major structural changes in 2022

The EB has committed to the sustainability target that TU Delft will be carbon-neutral, circular and climate-adaptive by 2030. TU Delft will also contribute to improving the quality of life on campus and making research more visible. Backed by €100 million, it was decided that all activities carried out on and off campus in July and September 2022 would be shaped from a sustainable focus.

Action plan

The main challenge here is to implement the sustainability action plan adopted in January 2022 with additional actions from the faculties and departments, focusing on local activities, in particular, to reinforce the urgency of and for sustainability, so that the entire community supports TU Delft's objective.

Specification

Further specification within the organisation focuses on:

- Education for sustainability, with the core question being what do the engineers of the future absolutely need to know about climate and sustainability?
- Research, valorisation and technology transfer, with the TU Delft Campus as a major living lab for sustainable innovations;
- Sustainable operations, focusing on these themes: ecocampus, construction and renovation; energy systems, mobility, ICT, procurement and waste management, food and drink;
- Engagement of the campus community, focusing on these themes: governance, social engagement and communication, reporting.

Priorities

Visible priorities are already being tackled or will be tackled shortly:

- Heat (base temperature at 19°C, attention to behaviour);
- Lighting (on only when needed);
- Travel (sustainable commuting and travel policy, trains not planes);
- Procurement and waste management (circular procurement policy);
- Food (sustainable and healthy offer, EAT-Lancet menu as the basis);
- Woodland (green on campus, working towards sufficient carbon offsets by 2030).

In addition, many steps have been taken in engaging the entire community on campus, making it feel jointly responsible and as though it is participating in the transition.

Milestones in 2022

- Protein Transition Symposium: following the discussions that arose when the Faculty of Architecture and the Built Environment made its restaurant vegetarian, TU Delft organised this symposium on the sustainable food supply of the Netherlands on 11 May 2022, attended by scientists and a broad representation from the food industry.
- Opening of ECHO (30 May 2022): TU Delft's first energy-generating, largely circular building, in which the restaurant is also vegetarian.
- Summer school of the Universidade da Beira Interior (Covilhã, Portugal) and TU Delft on sustainable campuses, with one workshop week in Delft and one in Portugal (18–29 July 2022), also supported by the Dutch Embassy in Portugal.
- IDEA League conference and summer school on The Sustainable Campus (5–9 September 2022), with publication of the report of the same name in which Chalmers University of Technology, RWTH Aachen, ETH Zurich, Politecnico di Milano and TU Delft present their approaches to climate action on campus.
- Biodiversity research: In Autumn 2022, RoyalHaskoningDHV started a baseline measurement of biodiversity on the TU Delft Campus, to come up with proposals for effective interventions for improvement.
- National Climate Week: NPO radio broadcast live every day from the Co-Creation Centre at The Green Village (31 October to 5 November 2022). During the Sustainable TU Delft Drinks (1 November 2022) at Lijm & Cultuur, the EB and sustainability coordinators presented their plans and discussed them with the audience.
- 'Innovation judge': the release of €95 million for sustainable CREFM-related investments also involves an amount of €20 million for innovations on campus; a governance and decision-making 'judge' was established for this purpose in autumn 2022.
- Sessions with the municipality of Delft and businesses and citizens of the city of Delft, at various times in 2022.
- Many interviews about TU Delft's sustainable approach in various media, including LinkedIn, radio and newspapers.
- The following milestones were initiated in 2022, but implemented in January 2023:
- Reusable cutlery sets offered to the entire TU community in preparation for phasing out disposable cutlery at the catering venues.
- Green Dragons' Den: pitches from twelve companies that had applied in response to news reports in the mainstream and social media, based on which TU Delft will conduct pilot projects with six of the companies. Green Dragons' Den attracted much coverage in social media and more will follow.

Making the campus more sustainable

For some years now, making the campus more sustainable has featured prominently in TU Delft's institutional strategy. The urgency to become more sustainable is palpable in society and the appointment of TU Delft's Sustainability Coordinator in 2021 also ensures that the need and willingness for intensifying sustainability on campus continues to grow.

We ran through several scenarios in 2022 to determine how the objectives in the 'Sustainable vision, ambition & action plan' can be achieved in a cost-effective, realistic and efficient manner.

In the preferred scenario, TU Delft is not only committed to making effective choices to reduce its carbon footprint in absolute terms, but also to remove constraints and barriers that still stand in the way of making both the campus and broader society more sustainable. This approach is in line with TU Delft's mission: impact for a better society. This recognises that the main challenge may not be the final situation, but rather the road towards it.

Real estate sustainability

In parallel with the ongoing efforts to make the campus more sustainable, several real estate projects ran in 2022. Integrated sustainability is already naturally part of these projects. Echo, the general teaching building was completed: an energy-generating building with circular interiors and a vegetarian canteen. The renovation of the high-rise section of building 36 (Faculty of EEMCS) was also completed in a sustainable manner, including through circular demolition and reuse of materials. Design and development teams have also worked diligently to prepare new buildings at TU Delft Campus South, which incorporate climate-adaptive ambitions in addition to energy and circular design.

Besides real estate development, construction and management, the move towards making facilities management more sustainable has also gained momentum. The sustainable ambition has been included in the tender for the catering facilities. Policy has also been developed to move away from single-use cups. Finally, over the next few years, facilities management will not only reduce waste streams in absolute terms but will also work with suppliers in the chain to make these streams circular.

Energy saving and generation on campus

TU Delft's anniversary theme 'speeding up the energy transition' took on a real-life dimension because of the energy crisis that emerged in early 2022. Persistently high energy prices are having an increasing impact on TU Delft and developments in the energy market are volatile. The university therefore launched an energy savings drive in 2022, looking at what can be done to reduce energy costs in the short term. Focus areas include reducing building temperatures to 19°C, adjusting closing times, using buildings more efficiently, and speeding up the further automation of climate and lighting control. What is actually possible varies from building to building. Research into and generating renewable heat on campus also continues to be developed. The Geothermal project partly depends on heat purchase guarantees from customers other than TU Delft, such as housing associations in the city.

Over the past year, housing associations and the consortium, which aims to construct the geothermal heat source, have intensified their co-operation transparently under the municipality's direction. The adaptation of building installations on campus has continued in parallel to be ready in time for 'medium temperature' from geothermal energy.

Long-term continuity of business operations

Safety and continuity of the university's primary process are preconditions for implementing the sustainable measures in the short term. In the long term, sustainability can in fact ensure that TU Delft can safely continue its operations on campus, for example, through limited dependence on external energy supplies and being resilient to more extreme weather.

What next?

With a supported vision, strategy and resources, TU Delft can make the campus more sustainable in a complete and planned way in 2023. As this requires all hands on deck, ownership of this issue needs to be embedded further in the organisation. The sustainability process is characterised by continuous improvement. Clear monitoring and proper alignment to adjust processes and policies are crucial. Meanwhile, the process is underway to make the campus available as a field lab for sustainability innovations, combining the strengths of our engineers, designers, scientists, the government and industry. This is how we actively contribute to society's sustainability issues. *Impact for a better society.*

5.3 Security

Knowledge security

The Knowledge Security programme was launched in January 2022, with one aim being to implement the recommendations of the Knowledge Security Guide. The programme delivered several visible results in 2022, including:

- the Partnering Tools, a country- and institution-neutral version of the earlier 'China Tools', adopted by UNL in December as a common basis for all universities;
- a Risk Analysis on dual-use technology at TU Delft, involving both a survey of the faculties and a data search on publications over the past three years. The Minister had explicitly requested this Risk Analysis in his letter of 4 April 2022;
- establishment of a Knowledge Security Advisory Team (five people) that meets weekly and discusses and provides advice on five to ten cases of researchers. Based on the 130 cases to date, the Advisory Team has prepared and distributed a Knowledge Security Advice Line, as an overview of its criteria and useful for researchers as a checklist. This Advice Line was enthusiastically received;
- a China symposium in April (60 visitors) and a knowledge security symposium in December (89 visitors).

Although knowledge security has received attention in previous years, the coherence and focus of all the efforts in this area increased significantly in the past year. Meanwhile, the core team consists of four FTEs and the overall programme involves 25 staff members spending up to two days a week on the subject.

On behalf of TU Delft, the programme is very active in the UNL (Knowledge Security Working Group), but also in the EU, such as the EU Knowledge Network on China (EUKNOC) and in its consultation with DG Research & Innovation. Among universities, TU Delft leads the working group on knowledge security at the IDEA League. Policy documents are regularly used as examples or templates in many of these bodies.

The knowledge security programme at TU Delft organised many presentation and knowledge transfer meetings, significantly increasing knowledge on the subject and unity of policy in this area over the past year.

Safety and Security

Safety and Security, together with other security departments, is committed to making the university a safe and inspiring environment. After the full launch of face-to-face teaching, the campus is busier again. The number of incidents for which the emergency response team, security or support departments were deployed is similar to the years before the COVID-19 pandemic.

Over the past year, the department has explored options for strengthening the security domain at TU, with the best solutions being implemented for the institute to provide maximum support in having an impact on a better society.

New steps have been taken in developing a Business Continuity Management methodology for TU Delft. This system is based on a bottom-up inventory of the main TU assets and was tested through a pilot project at QuTech in 2022. This project will be shaped further in 2023 in conjunction with ICT.

Safety and Security's expertise has been expanded to include an Export Control officer. Safety and Security is affiliated with the newly established Knowledge Security Advisory Team. Furthermore, the department is also involved in all major new construction projects (Physics, QuTech, Cleanrooms, Logistics and the Environment) and advises on safety in the broad sense together with other University Services. The department also contributed to a safe Introduction Week for the new students.

Lastly, new workshops were organised for academic counsellors, psychologists and student counsellors on what to do in case of worrying behaviour among students. Partly because Safety and Security is easier to find in the organisation, more cases of concerning behaviour were handled in 2022 and persons in need were offered appropriate assistance.

5.4 Digital services

ICT

ICT continues to invest in future-proofing the digital facilities for TU Delft. The reasoning behind this is that digitalisation contributes to the university's primary processes: teaching and research. Digitalisation of support processes is also aimed at better facilitating all parts of the university. A Digital Board with representation from the Executive Board, faculties and departments has been established to better manage continued focus on developing digitalisation. Meanwhile, work has started on drafting the comprehensive digital strategy for TU Delft, which will be ready in early 2023.

The DelftBlue supercomputer, commissioned in 2021, is proving to be a great success. And in co-operation with the TU Delft Institute for Computational Science and Engineering, ICT has started preparing an expansion to further increase the computing capacity for the faculties.

The first Cloud service has been successfully implemented. Several dozen research groups are already using computing power and storage capacity in the Cloud to their satisfaction. Because the Cloud differs substantially from an in-house data centre, a comprehensive risk framework has been drawn up so that steps to the Cloud can be taken responsibly. ICT's strategy on this issue is hybrid, meaning we will continue to use both the two in-house data centres on campus and Cloud capabilities.

Information security and the continued implementation of the General Data Protection Regulation (GDPR) remain a high priority for ICT. Partly in response to the problems at Maastricht University, it has been agreed nationally that universities will adopt a certain maturity level in terms of protection against external contingencies. This level will be reached in 2023. Significant steps have already been taken in that direction through the Versterken en Versnellen Security & Privacy (Strengthen and Accelerate Security & Privacy) programme in 2022. Checks and regular exercises, both external and internal, ensure that it also effectively protects TU Delft.

Business Intelligence

In 2022, the business intelligence expertise in TU Delft expanded and became more professional, in line with the principles adopted in the Strategic Framework. For example, opening up new data sources and offering new dashboards and analyses within the MiFOCUS business intelligence environment has increased the availability and usability

of information. The number of unique users of the BI environment continued to grow to 1,700 colleagues this year.

Information is now available for the general public through the Facts and Figures page on the TU Delft website: www.tudelft.nl/en/about-tu-delft/facts-and-figures. These dashboards had almost sixty thousand hits in the past year.

The Data Insights Team (Strategic Development) has also developed some new TU Delft-wide reports, covering topics such as the intake of new students and gender diversity. Many colleagues have also found their way to the Data Insights Team for answers to specific data-related questions.

5.5 Legal affairs

Regulations

Coronavirus

Although the coronavirus restrictions ended in 2022, the following measures have been arranged, partly based on regulations and policies (Service Document) of the Ministry of Education, Culture and Science, in line with those of the previous two Coronavirus years:

- a temporary relaxation of the Bachelor's-before-Master's rule scheme for admission to the 2022–2023 academic year: a deficit of 10 ECTS is allowed (in 2021 it was 15 ECTS). This is regulated and included in an addendum to the model Teaching and Examination Regulations (OER) and implemented for each degree programme;
- conditional admission to the bachelor's degree for HBO students with a propaedeutic (first-year) diploma, EU students and students from the Caribbean;
- the easing of the binding recommendation on the continuation of studies (BSA) for the 2021-2022 academic year has been included in the OER: the credits to be earned have been reduced from 45 to 39 ECTS.

Regular Teaching Regulations

One amendment has been adopted:

Name change to Engineering Doctorate (EngD)

The following name change has been implemented in the 4TU context from 1 September 2022: the Engineering Doctorate (EngD) degree replaces the Professional Doctorate in Engineering (PDEng) degree. The change is intended to clarify the distinction between the academic PDEng/EngD degree and the new Professional Doctorate (PD) degree, which will be offered by the universities of applied sciences from September 2022. The name change has been made in the relevant TU Delft regulations and the name of the regulation itself has also been changed: Engineering Doctorate Regulation, abbreviated as EngD.

Other

The annual changes to the model Teaching and Examination Regulations (OER) and Rules and Guidelines of the Board of Examiners have been implemented. The student charter has also been updated for the 2022/2023 academic year. The student charter lists students' rights and obligations and the relevant regulations for students. The documents have been updated to reflect new legislation and developments in practice.

In cooperation with the Library, the Short Work of Science Regulations (Open Access) were drafted. As part of the Open Access policy, further rules are adopted on how short works of science as referred to in Article 25fa of the Copyright Act are made available to the public 'free of charge' after their first publication.

In co-operation with HR, the Staff Ombuds Officer Regulations were drafted (following a pilot project and amendment of the collective labour agreement). These regulations provide an accessible reporting point for all TU Delft staff members who believe they have been treated incorrectly or unfairly, or who are struggling with questions, dilemmas or conflicts in the workplace. The Ombuds Officer supports individual staff members, groups or supervisors in analysing and resolving tricky issues.

Support has been provided to HR in arrangements concerning employment conditions.

Projects

Legal Services works with other departments to give legal substance to policies or projects. The main policy and other projects were:

National internship agreement

The UNL drafted a national model internship agreement after extensive consultation, on the internet and otherwise, with student organisations (ISO and LSVb), businesses and the Confederation of Netherlands Industry and Employers (VNO-NCW).

The model aims to agree uniform terms with companies, particularly on intellectual property, confidentiality and disclosure, so that the tripartite rights – of the company, student and university – are safeguarded. In the way it is implemented for each agreement, it also reduces work pressure.

TU Delft has started implementing the model for internships. This model will also be used for graduate internships in due course, possibly with some adaptation for the specific graduation aspects.

Convergence with Erasmus University Rotterdam and Erasmus MC

Legal Services has been closely involved in the further legal design of the Convergence. Several working groups are fleshing out arrangements between the institutions on the Convergence's legal structure, research partnerships, intellectual property, privacy and the legal status of staff members, among other aspects. This includes work on a model secondment agreement and a model hospitality agreement.

Privacy

With the description of privacy governance, the status of the TU Delft privacy team, consisting of staff from ICT and Legal Services, is secured in TU Delft's organisational structure. As part of the Strengthen and Accelerate Security & Privacy (VSSP) programme, work has been done to continue improving the professional level of security and privacy for TU Delft. Protocols for dealing with data breaches and requests for access and deletion have been made.

Among other tasks, the Data Protection Officer (DPO) is closely involved in speeding up the encryption project for laptops and mobile phones. This has further reduced the risk of data breaches. The DPO works closely with the Chief Information Security Officer (CISO) on these projects.

Real Estate

New building projects Campus South – Kluyver area

The campus strategy describes the future development of the campus. One area that will be developed under the campus strategy in the coming years is the Kluyver area. A new building will be constructed there for QuTech. Besides the new QuTech building, TU Delft will also construct a new general teaching building, a Physics building (Faculty of Applied Sciences) and Cleanroom building in the coming years. Legal Services has advised on the tendering and contracting of various services and works for these projects.

Geothermal Delft

TU Delft aims to operate on a fully carbon-neutral basis by 2030. TU Delft participates in Geothermie Delft B.V., which is making progress in the energy transition by extracting and using renewable energy in the form of geothermal heat and supplying it to the TU Delft campus and the city of Delft. This geothermal resource also enables scientific research and teaching in geothermal energy. Last year, Legal Services worked on various contracts and legal issues in the Geothermal Delft project, including the establishment of the Geothermie Delft B.V. joint venture. It further contributed to the R&D and several other agreements, including a heat supply agreement, expected to be finalised next year.

Objections, appeals, disputes and complaints

TU Delft students can object to or appeal against decisions made by TU Delft. Under the collective labour agreement, staff members can refer certain legal status issues to the disputes committee/disputes advisory committee. Objections, appeals, disputes and complaints must be carefully handled from a good governance perspective. They also reflect how the organisation is functioning and can lead to improvement in the implementation or content of regulations. The various forms of legal protection are explained below; the appendix to the Annual Report contains a list of the numbers of appeals, objections, disputes and complaints.

Objections, appeals and disputes

The EB decides on students' objections after full reconsideration. The EB is advised by the TU Delft Committee for Student Objections and other matters. The organisational aspects of this committee and the procedural provisions on objections are laid down in the Regulations on the TU Delft Committee for Student Objections and other matters, which is based on Article 7:13 of the General Administrative Law Act and Article 7.63a of the Higher Education and Research Act (WHW). Students may submit objections regarding rejections under the Profiling Fund Scheme concerning enrolment, unenrolment or tuition fees. Appeals from students and external students concerning the binding recommendation on the continuation of studies, exams, fraud, and so forth, are handled by the Examination Appeals Board (CBE) in accordance with Article 7.60 of the Higher Education and Research Act. In view of Article 7.62 of the Higher Education and Research Act, the organisational aspects of the Examination Appeals Board and the procedural provisions on appeals have been laid down in the Regulations of the TU Delft Examination Appeals Board. A student may appeal a decision on an objection or appeal to the Higher Education Appeals Tribunal (CBHO) under Article 7.66 of the Higher Education and Research Act (WHW).

A Sectoral Dispute Regulation NU has been adopted under the Dutch Universities collective labour agreement (NU CAO). This contains an exhaustive list of legal status issues on which a staff member can refer a dispute with their employer to a local staff disputes committee/ disputes advisory committee. Based on the 2018 Doctoral Regulations, doctoral candidates are able to submit objections to or complaints against decisions by or on behalf of the Board for Doctorates to the TU Delft Doctoral Arbitration Committee.

Complaints

TU Delft provides various options for submitting a complaint. The options are set out in the following regulations, for which the basis is always found in the General Administrative Law Act or the Higher Education and Research Act. The TU Delft Regulations on Student Complaints allow students to submit complaints to the EB about how an administrative body of TU Delft or a person associated with the university has acted towards them or another person. Under the TU Delft Staff Ombuds Officer Regulations, staff members can approach this ombuds officer if they believe they have been treated incorrectly or unfairly, or if they are struggling with questions, dilemmas or conflicts in the workplace.

The TU Delft Academic Integrity Complaints Procedure 2020 includes the right to submit a complaint if university staff breach or are suspected of breaching academic integrity. TU Delft Regulations for complaints about undesirable behaviour give someone confronted with the undesirable behaviour of an employee or student in a work or study situation the right to speak to a confidential advisor or to submit a complaint to the Undesirable Behaviour Complaints Committee (KOG). The TU Delft Regulations for Reporting Misconduct (Whistleblower Regulations) also offer the possibility to report misconduct.

Special attention is paid in this annual report to how a specific complaint of scientific integrity was settled, partly because this case has received publicity. The following is a summary of the statement on the TU Delft website:

Carelessness in the Nature article 'Quantized Majorana conductance'

An Academic Integrity Committee (CWI) investigation into the publication was launched in 2020 following the withdrawal of the 2018 Nature article 'Quantised Majorana conductance'. The first author and corresponding author involved had acted partly carelessly and partly with culpable carelessness. But there was no violation of scientific integrity. This was how TU Delft's EB ruled, based on recommendations by TU Delft's Committee for Academic Integrity (CWI), supported by external experts, and after an opinion by the Netherlands Board on Research Integrity (LOWI).

Dialogue on scientific integrity continues at TU Delft as a result of these proceedings, looking at what, if any, adjustments are needed to TU Delft's current set of instruments to safeguard scientific integrity.

In October 2021, a data steward was appointed at QuTech, similar to those at TU Delft faculties. QuTech also adopted a progressive data management policy in 2022.

5.6 ESG and environmental impact

ESG

In an ESG report, an organisation reports on its impact on the environment, social issues and governance. TU Delft is a socially responsible organisation and ESG reporting in the annual report provides the details of that responsibility. This report foreshadows the anticipated requirement for Dutch universities to start reporting on ESG in the coming years. Although the CSRD (Corporate Sustainability Reporting Directive) does not currently apply to educational institutions, it does affect TU Delft. Stakeholders who do have a reporting obligation can be asked to provide information in this area. Even though TU Delft has not yet carried out a materiality analysis, it considers the subject so relevant and important that it communicates through the management report what TU Delft is doing in terms of sustainability and ESG.

TU Delft's activities reported in the environment theme can be divided into two categories. First, what is being done under the three core activities: teaching, research and innovation. For teaching, this could include sections in curricula that address energy transition, use of materials, use of natural resources, and so forth. In research, this could include research programmes such as the Climate Action Programme and in innovation, the 24/7 Energy Lab, for example. The second category includes the supporting processes and the activities pursued to make them sustainable. This distinction is not yet made for the themes of social and governance.

Environment

Four topics are distinguished in this report for the environment theme:

1. **Climate change** How is TU Delft contributing to climate change mitigation and adaptation through its primary processes and in the supporting process?
2. **Natural resources** How do TU Delft's primary processes and supporting process help reduce the use of natural resources and in discovering and developing new ones?
3. **Waste and pollution** How do TU Delft's primary processes and supporting process help reduce pollution and make waste streams circular?
4. **Opportunities** How does TU Delft respond to the opportunities in the environment theme with its primary processes and in the supporting process?

Social

Four topics are distinguished in this report for the social theme:

5. **HR** How does TU Delft take care of its staff's well-being?
6. **Responsibility in performing the three core activities.** How does TU Delft contribute to a better society?
7. **Stakeholder resistance** How does TU Delft deal with resistance from stakeholders?
8. **Opportunities** How does TU Delft respond to the opportunities in the social theme with its primary processes and in the supporting process?

Governance

9. **Governance** How does governance contribute to the socially responsible organisation?
10. **Behaviour** How does behaviour contribute to the socially responsible organisation?

Subject	Activities
Environment	
1. Climate change	<i>Primary process</i> <ul style="list-style-type: none"> Teaching: 2.5 Accreditation and accountability (new Environmental Engineering degree programme) Study: see 3.2 – TU Delft Climate Action Programme Innovation: see 3.5. <i>Support processes</i> <ul style="list-style-type: none"> see 5.2 Sustainability
2. Natural resources	<i>Primary process</i> <ul style="list-style-type: none"> Teaching: 2.5 Accreditation and accountability (new Environmental Engineering degree programme) Study: see 3.2 – Energy transition Innovation: 3.5 TU Delft Service (Geothermal Delft) <i>Support processes</i> <ul style="list-style-type: none"> see 5.2 Sustainability
3. Waste and pollution	<i>Primary process</i> <ul style="list-style-type: none"> Teaching: 2.5 Accreditation and accountability (new Environmental Engineering degree programme) <i>Support processes</i> <ul style="list-style-type: none"> see 5.2 Sustainability
4. Opportunities	<i>Primary process</i> <ul style="list-style-type: none"> See H3 <i>Support processes</i> <ul style="list-style-type: none"> See 5.2 Sustainability
Social	
5. HR and social safety	<ul style="list-style-type: none"> See 4.1 Personnel policy
6. Responsibility in performing the three core activities	<ul style="list-style-type: none"> See H1 TU Delft
7. Stakeholder resistance	<ul style="list-style-type: none"> See 4.2 Community
8. Social opportunities	<ul style="list-style-type: none"> See 4.2 Community
Governance	
9. Corporate Governance	<ul style="list-style-type: none"> See H1 TU Delft See 4.3 Administrative co-operation
10. Corporate Behaviour	<ul style="list-style-type: none"> See H4.1 – Integrity and D&I See H5.5 Legal affairs

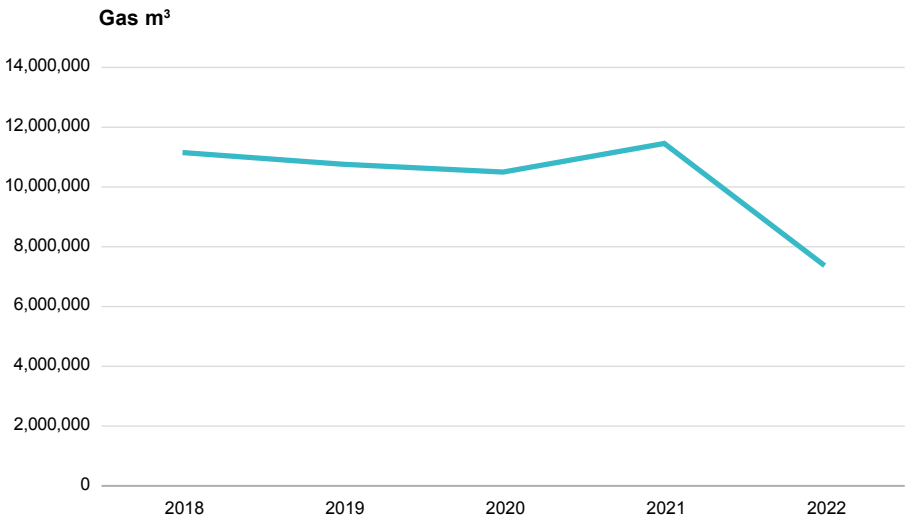
Environmental impact

TU Delft aims to be carbon-neutral, circular and climate-adaptive by 2030. The main categories of CO₂ emissions are natural gas consumption, commuting and air travel. The roll-out of the Geothermal Delft project not only contributes to the transition to natural gas-free but also to the reduction of energy consumption. By encouraging sustainable travel, TU Delft is also reducing its CO₂ emissions. TU Delft reports its CO₂ footprint according to the CO₂ performance ladder methodology. This methodology is in keeping with the Greenhouse Gas Protocol (GHG Protocol), which complies with the CSRD and ESRS (European Sustainability Reporting Standards). The scope of the footprint covers TU Delft.

External parties located on campus are not included in it. For more information on CO2 emissions and the emission factors used, TU Delft will publish its entire carbon footprint during 2023.

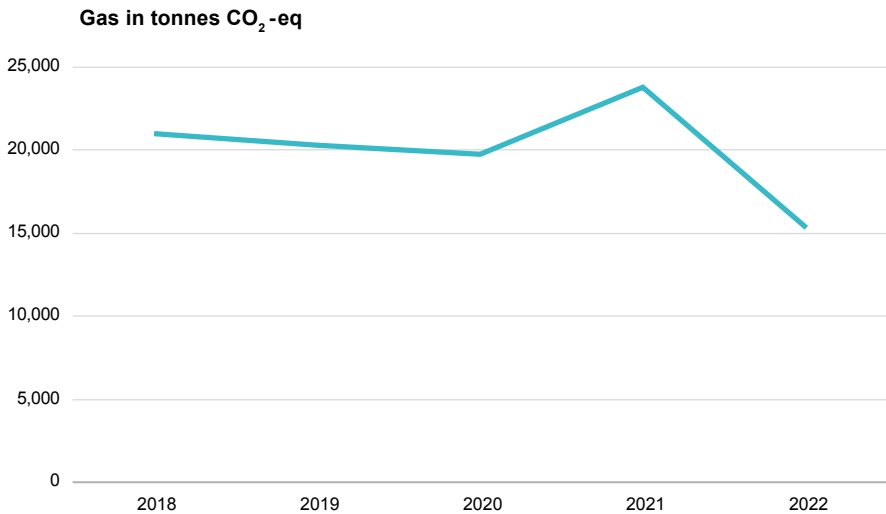
Gas consumption

Total gas consumption decreased in 2022. The two existing combined heat and power (CHP) plants, which produce heat and electricity, have almost not been running because of the current energy shortage caused by the war in Ukraine. The university therefore launched an energy savings drive in 2022. Focus areas include reducing building temperatures to 19°C, adjusting closing times, using buildings more efficiently, and speeding up the further automation of climate and lighting control. These measures and developments jointly resulted in a 36% decrease compared to 2021.



CO₂ emissions gas

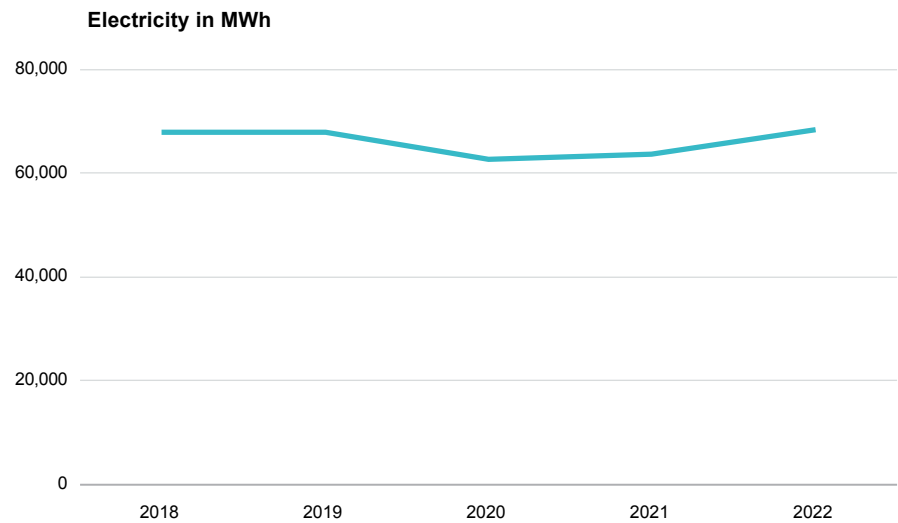
Emissions in CO₂-eq. per year of gas consumption.



Electricity consumption

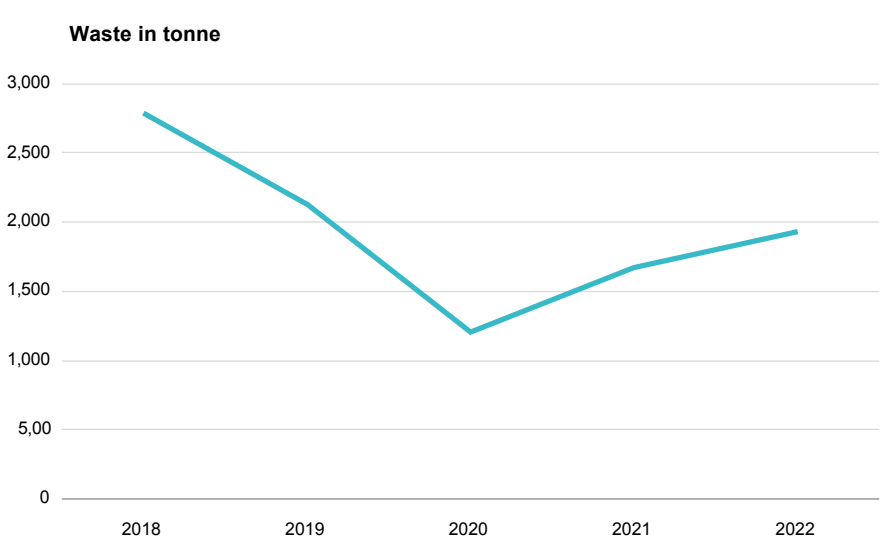
Electricity consumption increased in 2022 because the combined heat and power plants did not generate electricity, resulting in 29% more wind power purchased compared to 2021. Total electricity consumption for TU Delft increased by 7.5% compared to last year. This is explained by the opening of the high-rise section of building 36 after the completion of its renovations and the opening of the Echo teaching building.

The university had 1,200 solar panels installed on the roof of the Echo teaching building in 2022. TU Delft aims to increase energy-generation opportunities on its own campus. Around 1,132 MWh of electricity was generated from its own solar panels in 2022. This represents 1.7% of the total electricity consumption. Purchasing green electricity creates zero tonnes of CO₂ emissions.



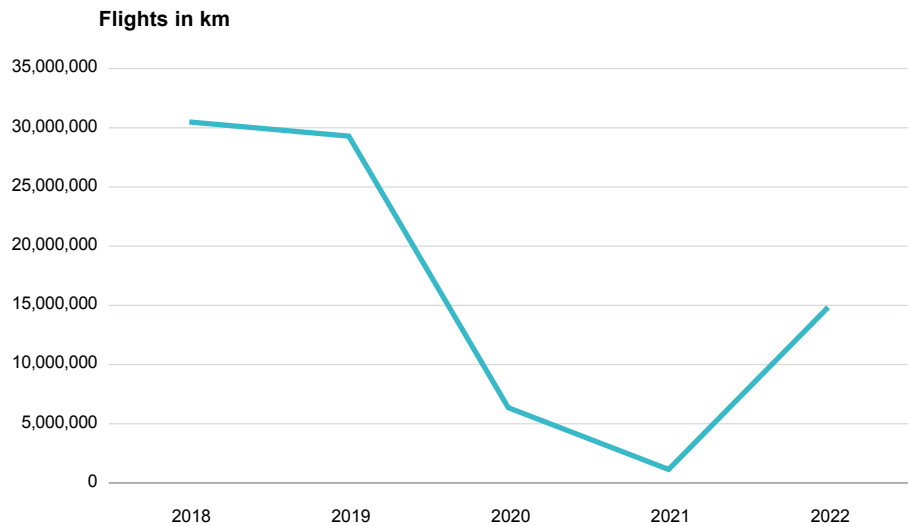
Waste production

The waste in tonnes for 2022 is around the same level as in 2019, before the COVID-19 pandemic. TU Delft aims in the coming years to not only reduce waste streams in absolute terms, but to also work with suppliers in the chain to make these streams circular.



Mobility

The graph shows business kilometres flown with our preferred supplier for foreign travel. A decline in flights for business trips can be observed during the COVID-19 pandemic. The real effects of our ambition for a sustainable travel policy (trains not planes) will become visible from 2023 onwards.



6

Investments within the quality agreements framework



6.1 TU Delft quality agreements

In anticipation of the quality funding to be received, TU Delft has been pre-investing since 2015. As of 2015, this pre-investment was €6 million per year and was increased to €8 million per year as of 2017 in consultation with the representative bodies. These amounts were consistently divided among the faculties based on long-term, structural plans. The distribution of this is also shown in the 2021 annual report. As the pre-investments from 2015 to 2020 have not been offset against future income, this has given an extra boost to the quality of education from TU Delft's own funds.

It was agreed in the Sector Agreement on University Education 2018 to invest the study advance through quality agreements funds in the years ahead. At TU Delft, these procedural arrangements are recorded in an addendum to the strategic plan 2018–2024 TU Delft Strategic Framework, which the Minister approved in summer 2019.

The Executive Board (EB) and the General Assembly of Councils (representative bodies and EB) have agreed in the quality plan that the additional student loan system funds that become available as from 2021 will be used in two ways:

- 1) through an investment fund focusing on improvement programmes with a project-based character in which the representative bodies take the initiative, and
- 2) through faculty plans, aimed at structural facilities in which the representative bodies at faculty level become involved at an early stage.

The allocation of these funds has not yet been specified in the quality plan – apart from the fact that they will contribute to the six themes – to make it possible to respond to the needs at that time.

In 2021, the quality funding that TU Delft received was higher than the consistent annual pre-investment of €8 million. In the last few years, additional quality funding was thus allocated to the faculties for the first time. In June 2020, an amount of €2 million was made available in the financial framework through the allocation ratio agreed in the quality plan. An additional €4.6 million was made available for 2022 through the same allocation ratio. The faculties then drew up plans in co-operation and coordination with their decentralised employee representative bodies. The agreed plans were then tested at central level against the six national themes for quality agreements and formally approved with the adoption of the 2022 budget. In several cases, the response from the representative bodies led to adjustments of the submitted plans. In this case, the representative bodies' response was discussed in the autumn meetings between the EB and the faculty. Some faculties, including Architecture and the Built Environment and Industrial Design Engineering, updated their previous plans in 2022 and also submitted them to the representative bodies.

The representative bodies also made proposals for the annual €0.5 million investment fund, which was increased once in 2022 by the same amount from the Van Rijn funds. The EB approved these proposals in December after which they can be implemented in 2023. The faculties periodically claim the costs incurred under the framework of the quality plans. Spending can be closely monitored this way, but reporting relies heavily on input from Finance and the project manager. The quality agreements are incorporated in TU Delft's regular planning and evaluation (P&E) cycle. When the financial framework, the budget and the quarterly reports to the EB and Supervisory Board (SB) are drawn up, the quality funds are always clarified separately. It is also the subject of discussion between the board and the representative bodies, as intended in the quality plan.

6.2 Expenditure and results achieved in 2022

For the overall picture, financial information is also provided on expenditure in previous years.

	2018 expenditure (in k €)	2019 expenditure (in k €)	2020 expenditure (in k €)	2021 expenditure (in k €)	2022 budget (in k €)	2022 expenditure (in k €)
Structural quality agreements	€ 8,553	€ 8,422	€ 8,374	€ 9,788	€ 14,743	€ 12,324
Investment fund quality agreements	€ 245	€ 537	€ 163	€ 262	€ 522	€ 345
Totaal	€ 8,798	€ 8,959	€ 8,537	€ 10,049	€ 15,265	€ 12,669

Structural investments

Most of the structural budget of €14.8 million was spent in 2022. A few faculties contributed to implementing the plans from their own funds, making the total investment in these structural activities at least €12.4 million in 2022. The additional increase in the budget coupled with the difficult labour market mean actual investments still lag behind the budget.

The table below shows the spending of the structural funds across the six themes for the 2018–2022 period. Brief notes are then given on the nature of the plans under the particular themes and the results to date. Each project is assigned to one theme in the table below. In many cases, the investments are such that partial results can be expected on more than that one theme.

Theme	Project	2018 expenditure (in k €)	2019 expenditure (in k €)	2020 expenditure (in k €)	2021 expenditure (in k €)	2022 expenditure (in k €)
1. More intensive, smaller-scale education	Total of projects Theme 1	7,449	7,277	7,355	7,581	9,794
	A+BE: Increasing teaching capacity	614	497	300	300	858
	CEG: improvement of quality, intensification and more small-scale education	878	901	910	996	950
	EEMCS: mathematics education and improvement of ES mathematics, including additional lecturers for Service teaching mathematics (2,017)	1,500	1,400	1,461	1,400	1,400
	TPM: Programme intensification and increasing teaching capacity	300	300	300	300	500
	Applied Sciences: Future-proof education	0	0	0	57	145
	3mE: Strengthening BSc teaching capacity, supervising MSc students, including additional MSc teaching capacity from 2017	2,912	2,964	3,092	3,164	3,000
	IDE: Intensifying teaching capacity (student supervision)	691	748	700	538	686

Theme	Project	2018 expenditure (in k €)	2019 expenditure (in k €)	2020 expenditure (in k €)	2021 expenditure (in k €)	2022 expenditure (in k €)
1. More intensive, smaller-scale education	Applied Sciences: 2021 - Additional lecturers for laboratory course teaching	0	0	0	0	0
	AE: Intensifying teaching capacity (student supervision)	553	468	592	500	969
	AE: 2021 more intensive supervision in teaching	0	0	0	125	0
	TPM: 2021 smaller-scale education	0	0	0	200	446
	AE, study advance funds 2021, dept. Space Engineering					30
	AE, study advance funds 2021, dept. AWEPP					12
	IDE, 2022, structurally 6 to 7 FTE lecturers					456
	EEMCS, 2022, Mathematics education and improvement of ES mathematics					209
	CEG, 2022, extra professors brought in before older professors retire -> expansion of staff, teaching and lab assistants					133
2. More and better supervision of students	Total of projects Theme 2	764	841	690	1,372	1,468
	A+BE: 2021, academic counsellors	0	0	0	76	0
	IDE: 2021, Additional supervision	0	0	0	201	245
	Applied Sciences Future-proof education	464	541	390	628	552
	University Services: Student activities	300	300	300	300	300
	CEG: 2021, Additional supervision	0	0	0	84	233
	Applied Sciences: 2021 academic counsellors/TAs	0	0	0	0	40
	EEMCS: 2021 - supervision of BSc programme	0	0	0	83	64
	3mE 2022, Academic counsellor					0
	CEG, 2022, Academic counsellor					34
3. Study success	Total of projects Theme 3	0	0	0	111	259
	EEMCS: 2021 learning tracks and programme choice checks (PCC)	0	0	0	111	64
	CEG: 2021, study success					195
4. Educational differentiation	Total of projects Theme 4	33	25	50	15	167
	AS: online programming education / design lecturers	33	25	50	15	
	A+BE: 2022. adaptation of curriculum, studios					167

Theme	Project	2018 expenditure (in k €)	2019 expenditure (in k €)	2020 expenditure (in k €)	2021 expenditure (in k €)	2022 expenditure (in k €)
5. Appropriate and good educational facilities	Total of projects Theme 5	74	30	19	175	107
	A+BE: 2021, digitalisation and metaframe	0	0	0	94	
	AE: 2021/2022, better educational facilities	0	0	0	75	77
	Applied Sciences: Instruments for laboratory course					15
	University Services: Study spaces	74	30	19	6	15
	TPM, 2022, facilities hybrid education					
6. Further professional development for lecturers	Total of projects Theme 6	233	249	260	534	529
	3mE: 2021, further professional development for lecturers	0	0	0	210	300
	A+BE: UTQ + activities					
	EEMCS: 2021 - lecturer quality training	0	0	0	3	64
	Applied Sciences: Future-proof education	33	49	60	0	15
	University Services: activities for lecturers (training, further professional development)	200	200	200	175	150
	IDE: 2021 lecturer training	0	0	0	74	
	A+BE: 2021, training and circular education	0	0	0	72	
	A+BE, 2022, Teaching advisor, diversity in teaching and better feedback model					
Total structural investments		8,553	8,422	8,374	9,788	12,324

At TU Delft, the student loan system funds (Higher Education) Act, i.e. the first €8 million of the quality agreements, are spent largely on teaching staff. This enables the quality of our education – especially the intensive, small-scale teaching methods used at TU Delft – to be maintained, even in the face of increasing student numbers. These investments have been used structurally to increase the staff complement and thus continued in 2022. The second and third tranches (2021 and 2022) have also been allocated to the faculties, and the plans, mostly structured in terms of staff, have been tested against the requirements of the quality agreements. Experience shows there are often start-up issues relating to the labour market for plans to get off to a good start, which is also reflected in some of these plans. Attracting sufficient and high-quality teaching staff has been a challenge at universities of technology for years. Faculties may transfer limited budgets between tranches and projects if there is reason to do so and the original objectives are not put at risk.

These additional lecturers/teaching support staff are presented under theme 1. These investments simultaneously have a major effect on many other themes, especially those of study success (theme 3) and educational differentiation (theme 4). For example, by

attracting people from specific fields of knowledge, the number of specialisations has increased, allowing a better response to the needs of students and the better distribution of students. This additional commitment to smaller-scale teaching also contributes to theme 4, educational differentiation, in accordance with the agreed objectives. Several faculties have also stated in the plans that this staffing has also been used to achieve more blended teaching (theme 3). Finally, the increase in teaching capacity achieved in theme 1 also positively affects theme 2: because of the expansion, more personalised supervision of students by lecturers has been included as a sub-goal in a number of proposals. In some cases, all staff costs, including those related to the other themes, were budgeted and claimed under theme 1; however, in the explanation below, the results are accounted for under the corresponding themes.

Explanation of expenditure by theme

Theme 1: More intensive, smaller-scale education

Engineering education is intensive because of the large number of contact hours. To enable us to cope with the large rise in the number of students while maintaining quality, a substantial amount of money from the student loans scheme is being used for this purpose, including policy proposals for the number of academic staff and lecturers' work balance. As mentioned earlier, additional staff, mostly academic staff and in specific cases support staff, obviously also has a positive effect on themes 2, 3 and 4.

All faculties have used this in the following way, making a distinction where necessary between allocations in terms of annual instalments; namely, the structural use from the study advance funds (tranche 1), almost all of which are allocated to theme 1, and the later tranches allocated as from 2021 and 2022. To avoid too much repetition (projects tend to run on a structural basis), the 2022 annual report only briefly discusses what has been achieved with investments before 2020.

Faculty of Architecture and the Built Environment (A+BE)

At the Faculty of Architecture, the study advance funds were used as from 2017 to hire qualified lecturers and support staff to work in education. By sharing the teaching duties among several people, the aim is to reduce work pressure and increase the quality of education. Plans for 2022 and reallocation include further focus on smaller groups in the BSc.

Faculty of Civil Engineering & Geosciences (CEG)

The plans have been achieved by increasing the permanent staff with over 10 FTEs. The objective achieved in the meanwhile was not only to improve the student/staff ratio, but also to create more space for graduates and to improve the courses on offer. A large number of student assistants have also been recruited to facilitate smaller tutorials.

The plans for 2022 and beyond included a temporary increase in staff by 3 FTEs by funding extra lecturers to overlap with those who would be retiring in due course. This succeeded for only one position in 2022. In addition to this, both two laboratory assistants teaching support and three teaching assistants have been recruited to better support the hands-on teaching required. Also included below is the budget for lecturers' improvement proposals focused on open education resources. Two projects were aimed at obtaining prior knowledge from non-TU-educated students entering the Master's degree programme and can also be used as refresher modules for existing students. One module focuses on training in a new course. Finally, a platform has also been created here where graduating students and graduates can exchange information about the graduation process, thus also supporting the student.

Faculty of Electrical Engineering, Mathematics & Computer Science (EEMCS)

Allocating these resources has led to the main objective of using additional teaching capacity. Specifically, it has led to a considerable increase in staff for service teaching mathematics, mathematics education services (ES), and staff for computer science engineering. The allocations (tranche 1) have collectively led to an increase in staff of 16 FTEs. In accordance with the intended objectives, this effort has led to smaller-scale teaching and making the group sizes manageable in relation to the student/staff ratio. The plans for 2022 and beyond are also mostly again focused on reducing groups and recruiting additional staff. In 2022, 3.8 FTE lecturers were recruited; less than the ten budgeted.

Faculty of Mechanical, Maritime & Materials Engineering (3mE)

With the help of these additional funds, great efforts have been made to reduce the size of student groups and to offer a wider range of opportunities for graduates and areas of knowledge. Until 2020, new research themes were set up by which the students could be distributed better across the faculty, leaving more time available for student supervision. Additional themes started in this way: Intelligent Vehicles/Robotics (linked to a new Master's degree programme track), Energy Storage Systems, Offshore and Mechanics at nano-scale. Additional investments were also made in the knowledge areas of composites, systems and control, subsea engineering, and safe surgery design, among others. More than 35 FTEs were recruited for this purpose. This also led to a decrease in the student/staff ratio from 40:1 to 36:1; the progression in the four-year BSc has also increased sharply.

Faculty of Industrial Design Engineering (IDE)

In the investment category 'More intensive, small-scale education', the faculty has used €500,000 per year from tranche 1 to make more time available to each student in the form of using additional FTEs for lecturers (intended: 5.5 FTEs; actual: 7.2 FTEs). This results in smaller teaching groups, a better balance between group and individual work and a lighter teaching load for current staff. Tranche 2 and 3 will also be fully used in teaching from 2022. To this end, 4 FTEs (tranche 2) and 5.6 FTEs (8 assistant professors) have been recruited for the long term, mostly with permanent appointments. This also ensures continued continuity and quality. The salary costs exceed the allocated budget and are borne by the faculty itself from government-funded grants.

Faculty of Applied Sciences (AS)

Over the years, there has been a shift in spending. The objectives have not changed, but student teaching assistants have been used increasingly often. The contribution of student teaching assistants to supervision and support has positively affected both the small-scale nature of teaching and reduced work pressure. The current situation (year-end 2022) is that the full amount is spent on using student teaching assistants. In the remaining term of the Quality Agreements, the Faculty of Applied Sciences (AS) aims to continue its maximum use of student teaching assistants while maintaining the set objectives. The salary costs of previously appointed technicians, lecturers and support staff will be paid by the faculty. AS has partially used tranche 2 to reduce the group sizes for the BSc laboratory course teaching.

The intended increase of 1.6 FTE lecturers was achieved for this purpose in 2022.

Plans for 2022 and beyond further include recruiting 0.5 FTE lecturers to support the VR laboratory course in 2023.

Faculty of Technology, Policy and Management (TPM)

To cope with the high work pressure across the faculty and improve the quality of teaching, four assistant professors were recruited in the faculty for 2020.

The 2021 allocation has also been used for this theme by facilitating the supervision of groups and the support of lecturers with a large group of senior student assistants. Partly because they are familiar with the education, they help to reduce the pressure on lecturers and can thus reduce the size of groups. Plans for 2022 and beyond have again focused on this theme by recruiting four additional tenure-track lecturers (three of these were appointed in 2022) and using more student assistants.

Faculty of Aerospace Engineering (AE)

In accordance with the objectives, the AE Faculty used all of the first tranche on additional staff in order to reduce the student/staff ratio and thus to be able to reduce the size of groups. To this end, eight FTE lecturers have been recruited. In addition, two FTEs have been recruited to support students with laboratory courses/completing their degrees.

The 2021 tranche was used as planned in three departments to reduce the group size, to provide additional personal supervision for graduation projects, or to use specific wind tunnel facilities (including expanding the online programme). More than 2 FTEs have been used for this purpose through tutors (Control & Operations department), technical staff (Aerodynamics, Flight Performance and Propulsion & Wind Energy (AWEPP) department) or junior lecturers (Aerospace Structures & Materials department). The plans for 2022 and beyond focus on appointing more staff (assistant professors/lecturers) and expanding online materials (video tutorials) for two courses in 2022 by student teaching assistants).

Theme 2: More and better supervision of students

The increase in teaching capacity achieved in theme 1 also positively affects theme 2: because of the substantial increase in lecturers, better personalised support for students is often also achieved. Where necessary, supervision and training for lecturers have also been provided, and academic counsellors and university psychologists appointed, from the university's regular funds.

The following faculties have also made specific efforts in this area.

Faculty of Architecture and the Built Environment

In 2021, in accordance with the proposals, an additional academic counsellor (0.65 FTEs) was recruited to provide more and better supervision to students. Because other plans came to a halt and in consultation with the representative bodies, an extra 0.8 FTE academic counsellor was also recruited.

The plans for 2022 have achieved further investments in improved student support and guidance (1 FTE).

Faculty of CEG

Plans for 2022 and beyond included recruiting an additional academic counsellor, who started in mid-2022 (0.8 FTEs).

Faculty of EEMCS

From the funds available as from 2021, EEMCS already started working in 2021 on a more diverse and inclusive Bachelor's degree programme, so that every student feels at home in the TU Delft community. The faculty also started creating additional awareness among lecturers about student well-being and how to help students with it.

Faculty of 3mE

Part of the first tranche at 3mE was used to recruit an academic counsellor to provide more student supervision, which is claimed under theme 1.

Faculty of IDE

In 2021, IDE made an additional commitment (of 1 FTE) for individual supervision of students who need it. Lecturers also received training in 2021 to recognise more quickly whether students need additional help (in terms of the educational content or from a perspective of well-being).

Faculty of Applied Sciences

Using funding from the first tranche, AS appointed 1.2 FTEs to strengthen student-oriented services (including academic counselling, supervision during internships). This later partly shifted towards the use of student mentors to improve student well-being and supervision. Funding from the second tranche (2021) paid for an additional academic counsellor to ensure student supervision.

Faculty of TPM

Under this theme, the plans for 2022 include additional support for completing one's studies (a thesis coordinator) and additional support for the Board of Examiners.

Theme 3: Study success

The efforts under this theme are designed mainly to improve 'studyability'. The curriculum of the Faculty of 3mE has also been revised, for example. The associated investments in staff have been classified under theme 1.

Faculty of CEG

As from 2021, the allocated funds have been used in the 'students and studying' project to improve student supervision during the degree course programmes. This project did not achieve its intended objectives. A new use is envisaged, partly in light of the adjustments in BSc and MSc.

Faculty of EEMCS

Under the theme of study success, the programme choice check for a better match between a prospective student and their chosen degree programme has been further developed since 2021. Efforts have also been made to ensure clear learning tracks in the course structure.

University Services

From these funds, €100,000 per year is available for the Profiling Fund to give students the opportunity to engage in extracurricular activities alongside their degree course programme. The funds have been spent within the TU Delft Profiling Fund Scheme, but not declared on the quality agreements.

Theme 4: Educational differentiation

Some of the available expansion of staff (theme 1) is designed specifically for educational differentiation. In line with the Strategic Framework, the room for electives in the Master's degree programmes will be increased, enabling students to build a solid foundation in terms of interdisciplinary skills, sustainability, entrepreneurial thinking and entrepreneurship. Using these additional lecturers has also regularly improved and expanded the teaching concept used.

Faculty of A+BE

The allocated funds (2022) were partly used to broaden the curriculum. Sustainability and diversity have attracted extra attention in this regard. Additional efforts have also been made to create more final project studios, allowing more people to complete their studies in their desired fields.

Theme 5: Suitable and high-quality teaching facilities

The efforts under this theme focus mainly on improving the facilities. Although additional study spaces have been created in several places across the campus, the financial justification for them has not always been within the quality agreements or they have been depreciated over several years.

Faculty of A+BE

Additional digital presentation facilities (photography and film equipment) were purchased from the 2021 tranche to improve these teaching facilities. Support for graduates started in January 2022. In consultation with the representative bodies, additional investments were also made in a test frame for demonstrating/experimenting with the mechanical reaction of materials and testing simple structural components. Additionally, VR facilities have been updated from the 2022 budget.

Faculty of AE

The 2021 tranche was partly used to create more suitable teaching facilities, such as specific computer clusters including accompanying licences in two departments (Space Engineering and Aerodynamics, Wind Energy, Flight Performance and Propulsion, a Space Flight Collaborative Design Lab and the Virtual Space Systems Lab). The educational aerodynamics toolbox started in September 2022 (1 FTE lecturer) and the lab of bioinspired additive manufacturing was expanded (1 FTE student support).

Faculty of 3mE

The Faculty of 3mE wants to offer more challenge-based project work. This trend, combined with the high intake in the Mechanical Engineering Bachelor's degree programme, puts pressure on the number of places and spaces available for project teaching and group work. The proposal (2022 tranche) is to equip the teaching square with proper furniture, audiovisual equipment and appropriate project facilities. Unfortunately, due to delays in the accommodation plan, the teaching square and its layout have also been delayed.

The faculty also invested extra in e-tooling in 2022. Besides extra effort in Brightspace, work has been carried out on a supporting portfolio tool for students to help them become aware of their own development, especially in the reflective engineer elements of the programme. A pilot project in the Maritime Engineering degree programme was successfully completed in 2022. A Jupyter hub has also been set up. It not only helps students in their learning, but also teachers in using programming and computing tools in their teaching. For further information, see: JupyterHub (libretexts.org).

Faculty of TPM

A small amount was invested in expanding hybrid teaching facilities in 2022.

Faculty of AS

The vast majority of the 2022 tranche was used for teaching/laboratory course facilities. The proposals included the doubling of fermentation facilities, expansion of digital measurement techniques and investment in a VR laboratory course. The largest investment concerned

biocontrollers and bioreactors, requiring a European tendering process. The contract was awarded in 2022. The actual delivery will be made in 2023. Every student will be given the opportunity to work with larger equipment. The digital measurement techniques project has been slightly delayed. The VR laboratory course is scheduled to start in 2023, in line with the planning.

Theme 6: Further professional development for lecturers

We encourage and expect our academic staff to continuously strive to improve and develop themselves in the field of education. This is also part of the new policy on the theme of Excelling in Education that was defined in the second quarter of 2019. For this purpose, TU Delft also offered lecturers a whole variety of support, such as courses and one-to-one supervision, in 2021.

Faculty of A+BE

From 2021, extra budget was used to make the team of lecturers more professional in various areas. This is a point of concern partly because of the intentional use of lecturers from practice. This involves training lecturers to assess and supervise uniformly, making proper use of the available digital and other design tools and integrating circularity in the various subjects at the faculty. This started in 2021 and, with budget from 2022, an investment was also made in a feedback tool, which became operational at the end of 2022. An additional teaching advisor also started in May.

Faculty of EEMCS

Part of the second tranche (2021) is being used to train student assistants and teaching support staff in didactic skills and quality awareness.

Faculty of 3mE

In accordance with the plan, an extra educational specialist was recruited for each department in 2021 to help the lecturers on the MSc programmes improve their knowledge and to assist the MSc coordinator by focusing on community building and mentoring Master's students. Education & Student Affairs also appointed an extra teaching advisor to support the Master's degree programmes. A total of eight people (5 FTEs) are involved.

Faculty of IDE

From the 2021 allocation, the Faculty of IDE has trained the first 150 lecturers on how to stimulate different/more effective learning behaviour of students by encouraging them to develop a personal profile as a designer and to learn autonomous study behaviour and critical academic reflection.

Faculty of Applied Sciences

The second and third tranches are being used to train the many student assistants in didactic skills, mentoring and quality awareness.

University Services

TU Delft is already making substantial investments in the innovation and digitisation of its education (including through Study Success projects and the Extension School) and recently, in co-operation with Leiden University and Erasmus University Rotterdam, also in educational research (through the Centre for Education & Learning). Although the corresponding activities under this theme have been started, they have not always been claimed financially under the quality agreements. This budget also offers specific opportunities to excellent lecturers for educational improvements (such as TU Delft Lecturer of the Year). Implementation is lagging behind, partly because of the COVID-19 pandemic.

Investment fund

Part of TU Delft's quality plan is an investment fund for smaller ad hoc educational improvement projects within the six nationally defined themes. An amount of €500,000 is available each year. The Student Council is taking the lead on behalf of the representative bodies (Student Council and Works Council) in collecting and drawing up project plans with support from TU Delft staff. Although these projects are monitored separately financially and in terms of objectives, all costs are not always claimed. In the report, these plans are discussed by theme as they include many small projects. Experience shows that although many great initiatives are started with this, the execution is not always flawless. Since 2020, a TU Delft project manager has been explicitly requested for each project to monitor substantive progress or perform it themselves.

In December 2021, the Student Council proposed the projects below within the framework of the investment fund as described above, to start in 2022, which the EB then approved:

Investment category	Investment plan	Amount (in k €)
Educational differentiation	Green thread: the strategy	215
Suitable and high-quality teaching facilities	Collegerama user environment: further requirements	65
Suitable and high-quality teaching facilities	Innovative student facilities as part of Society Library	95
Educational differentiation	PRogram of Innovation in MECHANics education (PRIMECH)	114

In December 2022, the Student Council proposed the projects below within the framework of the investment fund described above, supplemented by €500,000 from the Van Rijn funds, to start in 2023. The EB agreed to and adopted the proposals.

Investment category	Investment plan	Amount (in k €)
Educational differentiation	based learning at TU Delft	€ 120,000
More and better supervision of students	Let's Talk	€ 38,000
More and better supervision of students	Peer consultation plan	€ 38,000
More and better supervision of students	Unlocking students	€ 175,000
More and better supervision of students	Training in student guidance and student psychologists	€ 103,000
Appropriate and good facilities	Expanding and improving psychologists' spaces	€ 300,000
Appropriate and good facilities	Library collection wall	€ 211,000
TBD	Unforeseen	€ 23,000

Short-term improvement projects have been implemented since 2018, initially funded with unspent funds from 2016 and 2017. From 2019, these have been implemented under the header of the investment fund and the quality agreements. The table and sections below show the claimed amounts of project expenditure and the achieved results under the various themes.

Theme	2021 expenditure	2022 expenditure
1. More intensive, smaller-scale education	-	-
2. More and better supervision of students	146	16
3. Study success	-	68
4. Educational differentiation	54	42
5. Suitable and high-quality teaching facilities	20	140
6. Further professional development for lecturers	43	79
Total	262	345

Claimed budgets on investment fund projects

Explanation of investment fund spending in 2022

Under the theme of more and better supervision for students, a small pilot project was done on how to offer extra relaxation during stressful exam weeks (relax zone) from the 2020 investment fund. For this purpose, additional events have been put on in the Library during exam weeks to help students relax, such as taking a power nap or cuddling a dog.

As a result of the coronavirus-related budget made available in 2021, efforts under the theme of study success mainly focused on organising welfare-related activities for the student community. However, some of the projects promised for welfare-related meetings from the student associations and from student development could only be realized in 2022.

The Holoclass has been slightly delayed by the COVID-19 pandemic, but the first steps to move towards a pilot project in which teaching can be attended remotely through a hologram have been taken.

A researcher for sustainability in education has been appointed since 1 September. In the first few months, she completed literature reviews on sustainability in university education. In consultation with the Pro-Vice-Rector for Joint Education and others, an engineering framework was then chosen based on which education at TU Delft can be made sustainable. An education inventory has also been launched; BSc subjects, MSc subjects and minors are being reviewed with the faculties' GreenTeams. Steps have also been taken to establish a SIG or COP around sustainability in co-operation with TU Delft's Teaching Academy.

PRIMECH's main objective is Community Building among lecturers and support staff of mechanics subjects in the different faculties. Several workshops were organised in the Teaching Academy last year for this purpose, including on teaching Statics, ANS, the essence of mechanics teaching, Course Graphs and the use of examples in lectures. Besides a monthly Newsletter with announcements and useful information, there is also a LinkedIn page. The community is proving its worth by lecturers actively learning from each other how to deliver better mechanics education. The workshops are also well-attended.

TU Delft's aspires 'to offer an inspiring, fascinating, and attractive study environment that allows students to develop into critical, results-oriented, and socially responsible engineers'. Appropriate and good teaching facilities benefit this ambition. That is why many projects have been started for this purpose from the investment fund. In 2022, a number

of previously implemented projects such as self-study spaces in the Library and faculties, project tables, workshops and real estate investments have been amortised for accounting purposes.

The beta version of the online search tool for study spaces (spacefinder.tudelft.nl) became available in 2019. At the end of 2021, the project entered its second phase, taking into account the student community's wishes for a final version that included photos of the study places to show how busy a building is, alongside the regular update of the available TU-wide study places. The project will be completed in 2023.

As for facilities, the virtual reality facilities (in the Library) continued to be improved and accessibility expanded. Investments were also made in the purchase of a 3D scanner and a pilot project with Yewno (AI added value to library services).

The investment fund has made additional investments in Collegerama, a service that facilitates replaying recorded lectures. Collegerama proved to be a great tool to be able to rewatch recorded lectures especially during the COVID-19 pandemic, but it was also well used before that. Limited investment in 2022 helped to further improve the user interface.

We encourage and expect our academic staff to continuously strive to improve and develop themselves in the field of education. An educational psychologist started in 2021. As his work is integrated in Teaching and Learning Services, it is accessible to all TU Delft's teaching support staff. The experiences have been and are being incorporated into the UTQ (University Teaching Qualification) and specific teaching courses.

6.3 2023 and 2024 Budget

The 2023 budget was prepared in 2022. In line with the plan for implementing the quality agreements at TU Delft, no new plans have been requested in this budget round, but room has been created to use the extra budget to compensate for inflation. If required, room is offered to adjust faculty plans. Adjustments to budgets and content are discussed with the representative bodies.

The representative bodies are generally closely involved in this process. This has been a constant priority throughout the budget process. In April, ahead of the start of the formal budget process, the faculties were informed of the expected available funds for each faculty, so they could start early with the planning and there was enough time to involve especially the student section of the faculty representative bodies in this planning process. The experiences with this are so positive that we will continue this process in 2024.

Reflection of representative bodies on expenditure of study advance funds and pre-investments in 2022

In 2018, following the agreements on study advance funds, it was agreed that the structural investments of €8 million per year would be continued. The money was spent on all six themes, namely more intensive and small-scale teaching, more and better supervision of students, study success, educational differentiation, suitable and high-quality education facilities and further professional development for lecturers.

In 2018, it was also agreed to allocate an annual sum of €0.5 million from 2019 to 2025 to an investment fund for short-term, non-recurrent projects under the quality agreements. In 2022, a sum of €0.5 million was therefore again made available for non-structural projects to improve education. This Investment Fund offers opportunities to take a broader approach to the various themes that are consistent with the aims expressed by both the Executive Board (EB) and the representative bodies. In 2022, €0.5 million that was released from the Van Rijn funds was added to the investment fund amount. The total thus amounted to €1 million.

In 2022, an additional €4.6 million was allocated to faculties to implement new plans on top of the 2021 budget. The sections below reflect on what has transpired.

Investment fund

It has been laid down formally that the representative bodies, primarily through the student side, are to take the lead in formulating project proposals for spending these funds, and that the management of these projects is the responsibility of the ESA (Education and Student Affairs). The Central Student Council (SC) formulated the proposals in close consultation with the faculties and education services. A formal decision was then taken at the General Assembly of Councils of the Works Council and the SC in November 2022, after which the proposals were submitted to the EB for final decision-making.

The SC has been closely involved at the central level in developing the projects; it has been given every opportunity to contribute its own plans, which has enabled the representative bodies to pay extra attention to what they consider important. The parties worked together constructively, with a willingness to co-operate from within the organisation. There is room for improvement on how the progress and process of projects are communicated to the SC and project managers. Arrangements will be made in this regard.

The 2022 projects have started in 2023 and been well received. Students welcome the fund's emphasis on extra commitment to their well-being. The SC notes that it is difficult to consistently monitor ongoing projects to gain insight into whether they are being rolled out as expected. The SC hopes to establish an appropriate approach for this in 2023.

Decentralised use of funds

As in 2021, the funds were distributed among the faculties in 2022. The deans attempted to detail new plans during the budget process in close consultation with the local faculty representative bodies (Faculty Student Council (FSC) and Personnel Committee (PC)).

At TU Delft it was agreed that the representative bodies would reflect on the process in a separate letter for each faculty. The letters show that although this process has been well received at several faculties, concerns are being expressed that there is still room for improvement at one faculty. The criticism mainly concerns the timing of the process; the FSCs would like to be involved in the planning at an earlier stage. Ideas about this are being shared. People would like to be involved early in the process so they can actually contribute to the plans.

This process starts with informing the faculty representative bodies centrally. At the end of August 2021, a training course was provided for members of the faculty student councils, precisely because of the role that the faculty representative bodies play in implementing the quality agreements. In October 2022, the SC noted that knowledge on this subject had been lost during transfers from previous to new faculty student councils. ESA tackled this in consultation with the SC and planned structured moments to provide early information to current and future FSCs.

The FSCs involved in the process this year agree that the available money is well spent. The objectives are often achieved and the results are generally positive.

The Works Council and Student Council are positive about the process and pleased that TU Delft can perform its Quality Agreements.

7 Financial Report

7.1 Financial key indicators

(in millions of euros)	Financial key indicators					
	2022	2021	2020	2019	2018	2017
Income	913.7	824.7	790.1	758.6	714.1	660.2
Government and other contributions	575.9	515.5	468.8	438.6	403.1	378.0
Tuition and examination fees	71.4	74.3	77.9	73.4	69.5	65.1
Income from projects with third parties	227.5	206.1	198.4	215.7	210.0	195.7
Expenditure	859.8	791.0	732.3	715.7	723.2	664.0
Financial income and expenditure	-1.4	1.5	-1.2	0.2	-1.4	0.7
Result	48.2	35.3	57.0	40.6	-11.7	-4.7
Depreciation on fixed assets	44.4	42.7	42.6	37.7	43.6	39.6
Investments in fixed assets	76.2	91.8	76.1	56.3	55.1	70.4
Net cash flow	71.2	1.7	56.0	49.9	19.2	-30.5
Liquidity position	362.0	290.8	289.1	233.1	187.5	168.3
Fixed assets	613.5	585.6	530.2	497.0	484.5	476.3
Working capital	12.0	-5.9	4.2	-29.8	-49.7	-57.4
Group equity	543.0	494.9	459.8	402.8	369.8	378.4
Provisions	95.3	96.7	87.7	87.2	82.9	61.4

	Ratios						
	ECS	2022	2021	2020	2019	2018	2017
Total income growth	n/a	+10.8%	+4.4%	+4.2%	+6.7%	+8.2%	+2.5%
Growth in work for third parties	n/a	+10.4%	+3.9%	-/- 8.0%	+2.7%	+7.3%	+5.9%
Total expenditure growth	n/a	+8.7%	+8.0%	+2.3%	-/- 0.6%	+8.9%	+6.2%
Government contribution/total income	n/a	63.0%	62.5%	59.3%	57.6%	56.4%	57.3%
Work for third parties/total income	n/a	24.9%	25.0%	25.1%	28.3%	29.4%	29.7%
Personnel expenses/total expenses	n/a	73.6%	71.3%	71.3%	70.1%	67.5%	67.8%
Solvency I	n/a	48.4%	48.7%	47.4%	44.0%	44.6%	46.4%
Solvency II	30.0%	56.9%	58.2%	56.4%	54.6%	54.6%	54.3%
Current ratio	0.75	1.1	1.0	1.0	1.0	0.9	0.9
Trigger value excess EC		844.9	799.1	737.0			
Equity capital (excluding private)		503.8	463.4	433.9	n.v.t.	n.v.t.	n.v.t.

7.2 Financial developments

At the start of 2022, the world – and thus also TU Delft – were still in the grips of the coronavirus pandemic. As the year progressed, there was an increasing tendency to get 'back to normal', recognising the positive effects of hybrid working, studying online and having more online meetings. Geopolitical turmoil quickly followed the pandemic in early 2022. These developments affected TU Delft's students and staff and also its financial situation in 2022.

For several years now, TU Delft has been experiencing an increase in the number of students. This results in a high workload and the need to renovate and expand the real estate portfolio. TU Delft is also committed to making the campus more sustainable. In the years up to 2019, the financial pressure therefore increased. Since 2019, additional government funding has been allocated to TU Delft on a structural basis in response to the recommendations of the Van Rijn Committee. With these funds, a start has been made to resolve the constraints. Longer-term challenges remain, such as a timely response to the growth in student numbers to keep workloads under control. It is also important that TU Delft remains financially sound while continuing to meet all quality and sustainability requirements. Lessons from the coronavirus period are being used for structural, sustainable improvements in education and research. TU Delft has used various schemes, including the National Education Programme, to compensate the extra costs resulting from the coronavirus pandemic. These include the costs of delays resulting from coronavirus and of improving student welfare. Chapters 2 and 3 detail the use of funds from the National Education Programme.

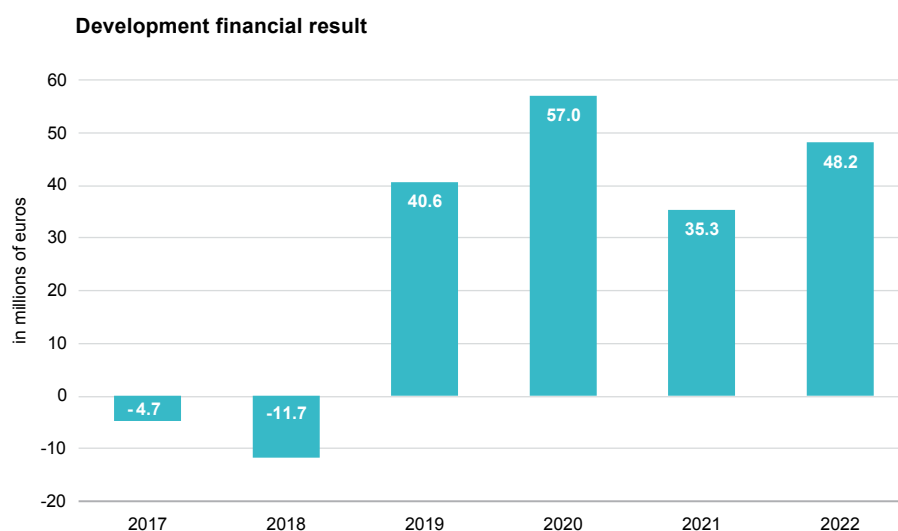
The 2022 financial result is explained below, followed by an analysis of the income and expenses. TU Delft's liquidity position, investments, provisions and group equity are then successively explained. Accounting for the Treasury Policy and the Investment, Loan and Derivatives Regulations, the remuneration of the Executive Board and Supervisory Board members and related expense claims closes off the chapter. The longer-term challenges are addressed in more detail in the continuity section (Chapter 8).

Financial result

In 2022, TU Delft achieved a financial result of €48.2 million, compared to a budgeted deficit of €11.7 million.

Statements of result compared to budget	(in millions of euros)
2022 Result	48.2
Proceeds of sale of an equity interest by Delft Enterprises	9.4
Release of a previously constituted personnel liability	7.4
Review of the accounting of the funds in the Gravitation Programme	5.6
	22.4
<i>Result effects indicative amounts (cannot be fully quantified):</i>	
Higher wage price compensation in the government contribution	17.0
Lower FTE recruitment because of tight labour market	10.0
Other effects	10.5
	37.5
2022 Budget	-11.7

Part of the result, i.e. €22.4 million, consists of special non-recurrent items, namely the proceeds of the sale of an equity interest by Delft Enterprises (€9.4 million), the release of a previously constituted personnel liability (€7.4 million) and a review of the accounting of the funds in the Gravitation Programme (€5.6 million). Government and other contributions were also higher because of a higher wage costs allowance than budgeted and the recruitment of well-qualified staff was sluggish in the face of the tight labour market. These effects cannot be fully quantified. However, together with other effects, they affected earnings by approximately €37.5 million.



The development of the result for the years 2017–2022 is shown in the chart above. Annual results were negative in 2017 and 2018. The positive result in 2019 was mainly the result of income that preceded expenditure because new staff were appointed in a later period (including for Sector Plans for Science and Technology and the additional funds as a result of the Van Rijn Committee's recommendations). The 2020 financial year was characterised by the coronavirus pandemic and several incidental results, including a non-recurrent VAT refund dated retroactively to 2018 (€10 million) and the sale of the 'Yellow Chemistry' building (€20 million). In 2021, the result was mainly affected by lower expenditure because of the coronavirus pandemic and delayed spending of the government contribution (Quality Agreements, Sector Plans for Science and Technology and National Education Programme funds). The additional funds received in 2019 were intended to address constraints in subsequent years and allow the organisation to respond to developments and the rise in student numbers. Although this got off to a good start, the coronavirus pandemic and tight labour market complicated matters. This partly led to the positive results for 2019–2022.

Student Loans (Higher Education) Act – Quality Agreements

As part of the Quality Agreements, €14.8 million has been made available to faculties and university services in the 2022 budget to enhance teaching quality based on structural plans. In addition, an annual sum of €0.5 million has been made available for an investment fund in short-term projects for which the Student Council takes the lead. A total of €15.3 million was therefore available in the 2022 budget. Expenditure in 2022 was €12.7 million (2021: €10.0 million). Compared to 2021, an additional €4.6 million was allocated in 2022. In accordance with the Quality Agreements, plans for this were included in the budget, but there was a lead time for their implementation. Particularly as a result of this, expenditure in 2022 was lower than budgeted. Additional information on the expenditure of the Quality Funds is provided in Chapter 6 of the annual report.

Sector Plans for Science and Technology

The 2022 budget considered total expenditure under the Sector Plans for Science and Technology of €14.1 million, of which €11.4 million was for filling the allocated positions and €2.7 million for additional plans resulting from underspending from previous years. All allocated positions (75 FTEs) were filled by the end of 2022 (2021: 69 FTEs); €10.4 million was spent for this purpose with a further €4.4 million expended on additional plans. As recruiting the right people for the sector plan positions has a lead time under current market and other conditions, all the funds have not been spent. The funds remain available for the coming years.

Sector Plans for Science and Technology II

The Ministry of Education, Culture and Science allocated the Sector Plans for Science and Technology II at the end of 2022. TU Delft received €6.0 million for this purpose. Unlike the aforementioned Sector Plans for Science and Technology (allocated in 2019), these funds are 'non-normative'. This means that income may be shown in the balance sheet and only accounted for as a government contribution once the corresponding costs have been incurred, or when the duration of the scheme has expired. €0.4 million was expended in 2022; the remaining funds will be spent from 2023 onwards.

NPO – National Education Programme

In 2022, €1.4 million was spent on National Education Programme (NPO) funds for education, with €4.3 million remaining for 2023 and 2024. A detailed explanation of this is provided in Chapter 2. An amount of €6.1 million has been spent on the research component of the NPO funds; the remaining €4.0 million for this purpose must be spent by the end of 2024. The explanation of this can be found in Chapter 3.

Starting and incentive grants

In July 2022, the Universities of The Netherlands (UNL) concluded the '2022 Administrative Agreement on Higher Education and Academia' with the Ministry of Education, Culture and Science, in which it was agreed that the Minister would make €156 million available annually on an ongoing basis for starting grants, and €144 million annually for incentive grants until the end of 2030. For TU Delft, this involved a total of €5.7 million in 2022.

As this is an entirely new instrument, the specific details and implementation of these grants have been considered at both institutional and national levels since the agreement was concluded. Various questions and problems have arisen in the process. For example, the grants have led to distribution issues at TU Delft. This is because the budget that TU Delft receives for the starting grants is insufficient to award them to all new assistant professors with a permanent appointment. Another factor was the desire to include the recommendations of the Ministry's incentive grants committee on the principles for awarding these grants in the specific details for the grants. However, these recommendations were not published in 2022. These questions around internal implementation have meant that there has been no expenditure in 2022. The funds will be spent from 2023.

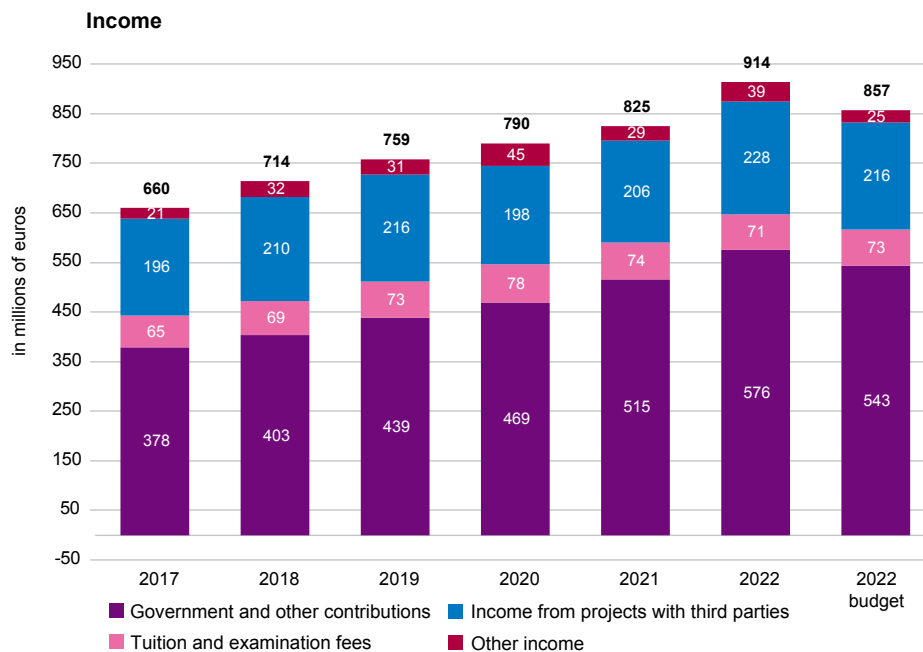
Gravitation programmes

At the end of 2012, the Ministry of Education, Culture and Science approved an application for the 'Frontiers of Nanoscience' (NanoFront) proposal as part of its Gravitation

(Zwaartekracht) programme. A total amount of €37,7 million (price level: 2021) was awarded for the entire consortium in the 2012–2023 period with a term until the end of 2023. In 2017, a sum of €20.5 million (price level: 2022) was awarded to the proposal entitled Building a Synthetic Cell (BaSyC) for the 2017–2026 period. As the cash flow from the government contribution does not coincide with the expenditure, an amount of €3.7 million (2021: €10.1 million) was included as still to be spent on the balance sheet at year-end 2022. A review of the accounting for the NanoFront funds took place in 2022, resulting in a release of €5.6 million. The expenditure is in line with internal plans and as coordinated with the Ministry and the Dutch Research Council (NWO).

7.3 Income analysis

Total income in 2022 (excluding financial income and the result from participating interests) increased by €89.0 million (10.8%) to a level of €913.7 million, compared to a budget of €857.3 million. The chart below shows the development of income per category for the 2017–2022 period.



Government and other contributions exceeded budget by €32.6 million in 2022. The main reasons are the wage and price compensation to offset the major impact of developments in the collective labour agreement. In addition, 'non-normative' allocations in the government contribution, such as the funds from the National Education Programme, provide higher income of €7.2 million. Although these funds were allocated in 2021, the costs were incurred in 2022 and therefore the income was also recognised then. In 2022, a €5.6 million review of the accounting for the Gravitation Programme was also recognised in income. Compared to 2021, government and other contributions show an €60.4 million increase to €575.9 million (+12%).

The tuition fees received in 2022 amounted to €71.4 million, less than the budgeted €73.2 million. This is because the actual growth in student numbers was lower than estimated in the budget. The actual tuition fees in 2022 were €2.9 million lower than in 2021. The decrease is due to statutory tuition fees being halved for the 2021/2022 academic year

– a scheme that was part of the National Education Programme. This scheme had a greater impact in 2022 (eight months), than 2021 (four months). TU Delft received compensation in the government contribution for this lower income from tuition fees. This scheme has ceased to apply as from the 2022/2023 academic year.

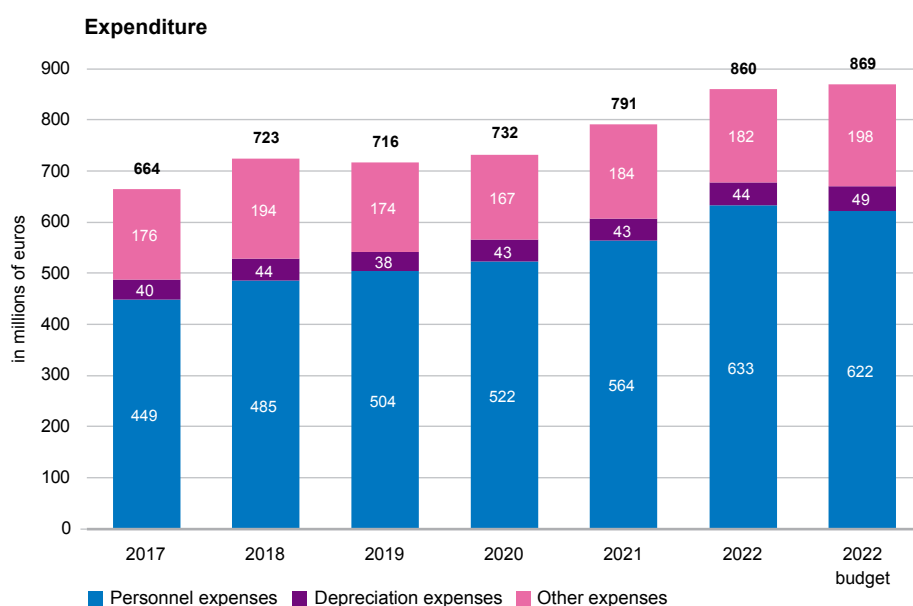
The number of students (on 1 December 2022) was almost the same as in 2021, this appears to be a temporary stabilisation. Student numbers are expected to rise again in the coming years. The ratio of students paying statutory tuition fees to students paying the institutional rate has remained stable at 90% and 10% respectively.

Income from projects with third parties exceeded budget by €11.8 million in 2022. Because of the uncertainties surrounding the coronavirus pandemic, budgeting was cautious, but project growth has been higher than anticipated. Compared to 2021, there has been an €21.4 million increase to €227.5 million (+10%). In the long-term development, the decrease in 2020 compared to 2019 was striking. This was due to a broad internal audit of the entire project administration, as a result of which more projects were closed with a positive financial result in 2019. As from 2020, the project administration processes have been tightened up, so incidental results like these are no longer expected.

The other income amounts to €39.0 million, higher than the budgeted €25.0 million. The main cause is the proceeds of the sale of an equity interest by Delft Enterprises of €9.4 million.

7.4 Expenditure analysis

Total expenses, excluding the financial income and expenses category, were €9.2 million lower than budgeted. Compared to 2021, expenses increased by €68.8 million to €859.8 million (+9%). Personnel expenses increased by €69.0 million (+12%). Depreciation expenses increased by €1.7 million (+4%). Other expenses (including accommodation expenses) decreased by €1.9 million (-1%) in comparison with 2021.



Personnel expenses

A breakdown of personnel expenses results in the following picture:

<i>in millions of euros</i>	2022		2022 Budget		2021	
Own personnel expenses	528,8	84%	538,3	87%	490,9	87%
Third-party personnel	70,6	11%	61,3	10%	55,2	10%
Change in provisions	2,0	0%	2,8	0%	9,2	2%
Other personnel expenses	31,7	5%	19,4	3%	8,8	2%
Total	633,2	100%	621,9	100%	564,1	100%

Own personnel expenses

Compared to the budget, own personnel expenses were €9.5 million lower in 2022 because of the delayed filling of vacancies. Compared to 2021, own personnel expenses increased by €37.9 million to €528.8 million. This is due to the increased number of FTEs and the CLA wage increase of 4% with effect from 1 July 2022 as well as a non-recurrent CLA payment of €750 per FTE for minimum-wage employees and €400 per FTE for all other employees.

The budget took account of the institution's total staff of 6,795 FTEs at the end of 2022. At year-end 2022, the institution's total staff amounted to 6,628 FTEs, i.e. 167 FTEs lower than budgeted and 312 FTEs (+4.9%) higher than at the end of 2021. The academic staff increased by 225 FTEs (+5.8%), of which 156 FTEs were researchers, doctoral candidates and other academic staff, and 69 FTEs were full professors, associate professors, assistant professors and lecturers. The support staff (including student assistants) increased by 87 FTEs (+3.4%).

A large part of the increase in FTEs concerns the use of additional resources that TU Delft has received since 2019 because of the reallocation following the recommendations of the Van Rijn Committee, Sector Plans for Science and Technology and the increasing quality funds.

Expenses for third-party personnel

<i>in miljoenen euro's</i>	2022		2022 Budget		2021	
Education (hiring of professors and guest lecturers)	1.7	2%	1.6	3%	1.7	3%
Temporary agency workers	5.3	7%	10.9	18%	3.7	7%
Payment for services rendered by third parties	53.7	76%	40.6	66%	47.0	85%
Travel and accommodation expenses of third parties	1.6	2%	-0.7	-1%	0.4	1%
Government funding for personnel of third parties	62.3	88%	52.4	85%	52.7	96%
Indirect and contract funding for personnel of third parties	8.3	12%	8.9	15%	2.4	4%
Total	70.6	100%	61.3	100%	55.2	100%

Hiring third-party personnel in 2022 exceeded budget by €9.3 million. In absolute terms, the hiring of third-party personnel increased by €15.4 million compared to 2021 but is growing in line with the growth of the institution and remains almost at the same level as a share of total personnel expenses. Given the tightness in the labour market, some of the vacancies that are filled later or not filled are filled by hiring third-party personnel.

Depreciation

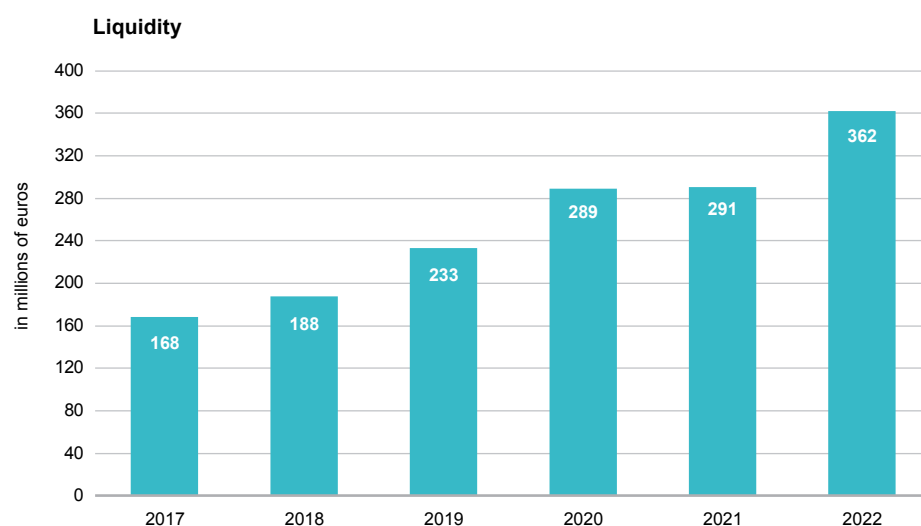
Depreciation was €4.4 million below budget in 2022, especially for equipment and inventory, which is in line with the investments that have been postponed. Compared to 2021, depreciation increased by €1.7 million, of which €1.4 million was depreciation on land, buildings and roads and €0.3 million was depreciation on equipment and inventory.

Other expenses (including accommodation expenses)

Other expenses (including accommodation expenses) were €16.1 million lower in 2022 than budgeted, partly due to the release of a €7.4 million personnel liability constituted in 2021 and a higher VAT refund (pro rata) of €3.8 million. A decrease of €1.9 million (-1%) is visible compared to 2021. Accommodation expenses increased by €7.2 million. Increased energy prices led to an increase of €2.9 million in 2022. Other expenses decreased by €9.1 million, including the release of a provision of €7.4 million.

7.5 Liquidity position

At year-end 2022, TU Delft's liquidity position was €362.0 million (year-end 2021: €290.8 million).



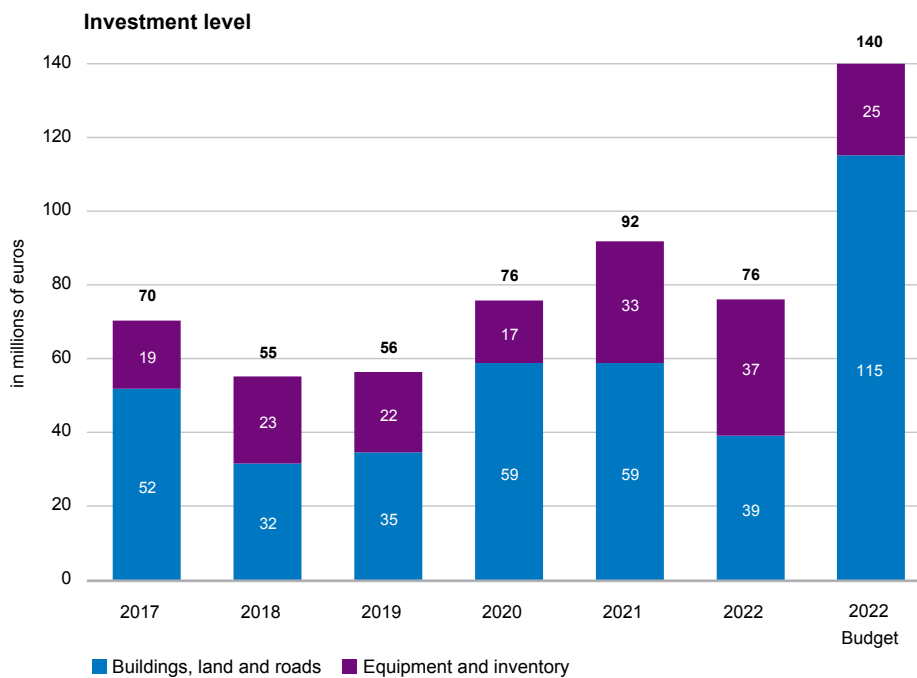
Working capital increased by €71.2 million, mainly due to more advance payments of tuition fees, payments received for coordination activities and government funding (Sector Plans and starting and incentive grants) received in advance. These are funds for which liabilities exist and for which cash outflows are expected in the short term. Payments received for coordination activities, in particular, should be passed on to partners within indirect and contract funding projects.

The excess liquid assets will really be needed in the coming years to finance the necessary investments in real estate and innovation in education.

The long-term financial estimate shows that the liquidity position will diminish as a result of this in the coming years and that external funding will be required according to the latest estimates as from 2024. This is explained in the continuity section (Chapter 8).

7.6 Investments

Total investments in 2022 amounted to €76.2 million. This is €63.8 million lower than budgeted and €15.6 million lower than 2021 (-17%).



Investments in land, buildings and roads were €75.7 million lower than budgeted. This is mainly due to updates for the phasing of real estate projects as a result of market developments. These include the new Applied Physics building, relocation of Logistics & Environment and Applied Sciences building 22 projects. Investments in land, buildings and roads were €19.6 million lower than in 2021. Investments in equipment and inventory were €4.0 million higher than in 2021. The main investments in 2022 related to renovating the EEMCS faculty building and fitting out the newly completed ECHO teaching building.

7.7 Profiling Fund provisions and accounting

In 2022, total provisions decreased by €1.4 million, from €96.7 million at the start of the year to €95.3 million at the end of the year.

<i>in millions of euros</i>	Year end 2021	Changes in 2022			Year end 2022
		<i>release</i>	<i>allocation</i>	<i>withdrawal</i>	
Staff provisions	34.3	-9.3	11.3	-6.1	30.2
Other provisions	60.5	-0.3	5.4	-2.6	63.0
Student provisions	1.9	0.0	2.1	-1.9	2.1
Total	96.7	-9.6	18.8	-10.6	95.3

Staff provisions and redundancy pay

Staff provisions decreased by €4.1 million in 2022. The method for valuing the long-service anniversary provision was refined in 2022. This change in estimate relates specifically to the allocation method for a 40th long-service anniversary, where the provision is based on the likelihood of staying from the first year, instead of from 25 years. Other than that there were no extraordinary changes in 2022. For staff entitled to redundancy pay, TU Delft offers reintegration support in co-operation with an external party. This policy is aimed at actively guiding and supporting these staff in finding new employment.

Other provisions

Other provisions increased to €63.0 million in 2022, representing an increase of €2.5 million for the year. Withdrawals totalling €2.5 million were made for asbestos and sewerage works, with the largest allocation recorded in the RID removal provision, which is increased by €3.4 million each year.

Profiling Fund student provisions and accounting

The student provisions relate to the Profiling Fund. Through the Profiling Fund, certain students can apply for financial support if they experience delays in the progress of their studies due to special circumstances. In 2022, payments made from the Profiling Fund totalled €1,878,000. Of this amount, €885,000 was paid for circumstances beyond students' control and €993,000 for serving in a board position. In total, 1,551 students received a payment in 2022 (1,429 EEA students and 122 non-EEA students).

Applications to and the actual payments from the Profiling Fund do not necessarily occur in the same financial year. This is taken into account when creating the provision. The specification of the current provision is shown in the table below:

	Applications	Granted	Total award	Average amount in euros	Average duration in months
HE students force majeure (illness, disability, family circumstances or infeasible course) EEA	273	259	€ 365,582	€ 323	4.37
financial support to non-EEA HE students	72	66	€ 408,229	€ 1,506	4.11
Board members of study or student associations or Student Council EEA	1,326	1,179	€ 1,045,096	€ 247	3.59
financial support to non-EEA HE students	55	50	€ 109,652	€ 665	3.30
Other categories: achievements in sports or culture EEA	5	5	€ 8,215		6.20
financial support to non-EEA HE students	-	-			-

7.8 Capital position

Group equity increased by €48.1 million (+9.7%) compared to year-end 2021 to €543.0 million. Of the operating result €48.2 million was allocated to the general reserve (€44.1 million) and €3.7 million to the special-purpose reserve). A total of €4.9 million was withdrawn from the special-purpose reserve and the special-purpose fund. Group equity at the end of 2022 consisted of €39.2 million in private funds and €503.8 million in public funds.

The trigger ratio calculated by the Ministry of Education, Culture and Science for possible excessive public funding of education institutions is €844.9 million for 2022; the group's equity excluding private funds was €503.8 million at the end of 2022, thus well below this trigger ratio by €341 million (40% below).

7.9 Treasury Policy & Investment, Loan and Derivatives Regulations

TU Delft's treasury policy is set out in the TU Delft Treasury Charter and in line with the Ministry of Education, Culture and Science's Investment, Loan and Derivatives Regulations 2016. The policy is risk-averse; it is aimed at identifying, preventing and, where necessary, hedging risks. The intention is to optimise the interest charges of loans and the return on available liquidity within the stated frameworks. TU Delft complies with applicable laws and regulations on this subject in relation to the following aspects.

Public/private funds

TU Delft has made no distinction in its records between public and private funds, except for the private funds that are placed with specific affiliated and co-consolidated legal entities.

Liquid assets

All of TU Delft's temporary liquidity surpluses stemming from the core activities of education, research and knowledge valorisation are public funds. In 2022, the liquid assets were held at the Ministry of Finance (treasury banking) or at creditworthy Dutch financial institutions (with at least an A rating). The total balance of liquid assets on the balance sheet date is available immediately.

External Financing

TU Delft has no external financing.

Currency risks

In 2020, forward exchange contracts (USD-EUR) were concluded to hedge currency risks. These contracts expired in 2022. There were no current forward exchange contracts at the end of 2022.

Securities

At year-end 2022, TU Delft's investment portfolio of equities and bonds was worth €12.1 million (2021: €13.0 million). The investments are private in origin and are held by Stichting Nanoscience TU Delft and Stichting Het Lammingafonds (legal entities consolidated in TU Delft's financial statements). These legal entities have their own financial records, receive no public funds, and thus do not fall under the Investment, Loan and Derivatives Regulations for Educational and Research Institutions 2016, issued by the Ministry of Education, Culture and Science. The invested capital has been placed with external asset managers. The asset management is designed to be consistent with the objective of the legal entities and the long-term investment horizon. The securities portfolios have a neutral risk profile on average.

Long-term financial estimate

TU Delft uses a long-term financial estimate model for liquidity and financing planning (spread over periods of 5, 10 and 30 years). This model is based on the campus strategy (10 years), the estimate of the student population for the government contribution and tuition fees, long-term budgets of the faculties and other management units and some historical data. The results of this model are also the basis for the long-term budget presented in the continuity section (Chapter 8).

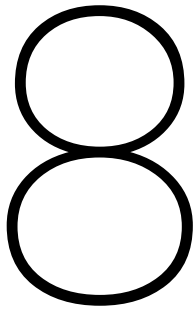
7.10 Remuneration of the Executive Board and Supervisory Board

The remuneration of the individual EB and Supervisory Board members is recorded in TU Delft's financial statements and is in line with the accountability obligation arising from the Annual Reporting Regulations for Education.

7.11 Expense claims

Declaraties 2022	Prof.dr.ir. Tim van der Hagen <i>Rector Magnificus / President</i>	Prof.dr. Rob F. Mudde <i>Vice-Rector Magnificus / Vice-President</i>	Mw. Drs. Marien E. van der Meer <i>Vice President Operations</i>
Representation expenses, including the fixed expense allowance	€ 604	€ 520	€ 670
Travel expenses in the Netherlands	€ 16,288	€ 5,927	€ 4,306
Travel expenses outside the Netherlands	€ 938	€ 1,380	€ 301
Other expenses	€ -	€ -	€ 16,452

The above table summarises all costs incurred for the Executive Board members, other than remuneration, in accordance with the uniform approach agreed between the Universities of The Netherlands (UNL) and the Ministry of Education, Culture and Science for accounting of EB members' expense claims (expense claim rules for EB members at Dutch universities). Expense claims mean reimbursements for costs incurred or services rendered. Other expenses at the Vice President Operations relate to training costs.



Continuity section

8.1 Introduction

In accordance with the requirements of the Annual Reporting Regulations for Education (RJO), this section provides insight into the policy for the coming years, along with the expected consequences for TU Delft's financial position. The data have been taken from TU Delft's 2023 budget, approved by the Supervisory Board on 19 December 2022.

8.2 Developments in key indicators (Part A1)

Expected student numbers

estimated position 1/12	2022	2023	2024	2025	2026	2027
Student numbers	26,700	27,600	28,400	28,800	29,100	29,400
Growth compared to previous year		3%	3%	1%	1%	1%
Growth compared to 2022		3%	6%	8%	9%	10%
Bridging students/students on joint degree programme	1,400	pm	pm	pm	pm	pm

In accordance with the estimate at the time of preparing the 2023 budget, the number of students at TU Delft will continue to increase over the coming years. The table above shows the expected development of the student population. This concerns the estimated 1 December status figures per year of the students registered at TU Delft. These status figures have been used to estimate the tuition fees for the coming years. The bridging students and students who take part in a joint degree programme and are registered at another university come on top of that. In 2022, this concerns around 1,400 students, who put pressure on teaching capacity in addition to regular students. This number is expected to decrease slightly in the coming years. This trend is being seen at more universities.

The number of students has grown by over 50% in the past ten years. The growing number of students means that the student/staff ratio is under pressure. This has deteriorated from around 16 to 1 in 2011 to around 21 to 1 in 2019 (according to the definition used in the UNL context)¹. In recent years, the student/staff ratio has decreased again (18 to 1 in 2022 and 17 to 1 in the 2023 budget). Additional funds such as the Quality Funds and the funds resulting from the Van Rijn Committee recommendations have largely contributed to this.

¹ Definition of the student/staff ratio: number of students/teaching staff (full professors, associate professors, assistant professors and lecturers)

Most staff in the full professor, associate professor and assistant professor categories are responsible for conducting scientific research in addition to teaching. The ratios stated above are the average for the entire institution. For some degree programmes, the ratio is more than 30 to 1. The use of the Van Rijn funds from 2020 and the increasing Quality Funds will thus partially alleviate these constraints, but this improvement remains under pressure because of the rapidly rising number of students, further complicated by the tightness in the labour market.

Expected staff numbers

<i>estimate in FTEs</i>	Actual 2022 (year-end)	Actual 2022 (average)	Budget 2023 (average)	Budget 2024 (average)	Budget 2025 (average)	Budget 2026 (average)	Budget 2027 (average)
Academic Staff	4,091	3,944	4,294	4,415	4,477	4,524	4,570
Full professors, associate professors, assistant professors, lecturers	1,560	1,511	1,625	1,672	1,696	1,713	1,731
Researchers, doctoral candidates, other academic staff	2,531	2,433	2,669	2,742	2,781	2,810	2,839
Administrative and support staff	2,500	2,477	2,822	2,870	2,910	2,940	2,971
Sas	36	36	47	48	50	50	50
Total	6,628	6,457	7,163	7,332	7,437	7,514	7,591

The table above shows the expected development of the FTE numbers with an appointment at TU Delft. A distinction is made between the job groups 'academic staff', 'support and management staff' and 'student assistants'. This division is consistent with the usual system applied at TU Delft. Executive Board members have been excluded above in line with the financial statements. The Executive Board consists of 2 FTE full professors (academic staff) and 1 FTE support and management staff.

As the student population continues to rise in the current estimate, teaching staff capacity will need to be increased further in the years ahead. This naturally also affects the number of FTEs required as support staff. Because of the overlapping nature of education and research, this growth will also have an effect on the required number of research FTEs. Although the funds resulting from the Van Rijn Committee recommendations offer opportunities to solve several existing constraints in education, this is still a separate issue from the expected student growth in the years ahead. Because of the current labour market and both national and international competition, the challenge of recruiting the right people in time remains significant, and HR is therefore also supporting and monitoring this process extensively.

Besides salaried staff, TU Delft also has registered individuals who are unpaid (voluntary staff). These employees largely co-determine the required capacity of permanent academic staff, support, accommodation, ICT facilities and so on. The total number of doctoral candidates at TU Delft is particularly important in this context; after all, their supervision places a burden on the capacity of full, associate and assistant professors. At the end of 2021, 3,001 doctoral candidates were registered at TU Delft. By the end of 2022, this number had grown to 3,152 (of which 1,767 FTEs are paid).

8.3 Long-Term Budget (Part A2)

2023 Budget

The total budget is €927.2 million, an increase of 1.5% compared to 2022. In 2023, and in line with the reserve policy, faculties will further reduce their reserves, also spend funds received in previous years (including Sector Plans for Science and Technology) and provide an impetus to support the growing institution. A key focus here is on digitisation. This all translates into additional expenditure, mainly in additional staff, but also because of investments in equipment and facilities. Increased energy tariffs also cause higher energy costs. In conclusion, this results in a budget deficit of €30.7 million in 2023 to be charged to the institution's general reserve, which is 3.3% of the total budget. Staff numbers will grow to an average FTE size of 7,163 in 2023 (+10.9% compared to the 2022 average).

Details of how various issues have been taken into account in the 2023 budget will be provided below. First, the specific earmarked funds from the government contribution, namely the NPO funds and the funds from the Quality Agreements, followed by the other income from government funding. Investments included in the 2023 budget are also discussed. Focus then shifts to the long-term budget for the period from 2024 onwards. This includes an estimate of income and expenses as well as a forecast of the balance sheet for the 2024–2027 planning period. It also shows the movements expected in the liquidity position and the solvency ratio.

Sector Plans for Science and Technology

The 2023 budget considers total expenditure under the Sector Plans for Science and Technology of €16.6 million, of which €12.4 million is for filling the allocated positions and €4.2 million for additional plans resulting from underspending in previous years. An amount of €13.1 million in income is taken into account in the government contribution. As these funds are normative, this results in a financial loss of €3.5 million.

Sector Plans for Science and Technology II

Funds received from 2022 onwards under the Sector Plans for Science and Technology II have been allocated as non-normative. In 2023, €1.8 million of expenditure is taken into account; the remaining funds received for 2022 and 2023 are earmarked for expenditure in the coming years. Due to the non-normative nature, the timing difference between income and expenditure has no effect on the financial result.

Quality agreements – Student Loans (Higher Education) Act

TU Delft obviously invests continuously in the quality of its education. In recent years TU Delft also invested an extra annual amount in the quality of education, partly in advance of the then expected funds from the Student Loans (Higher Education) Act. Starting in 2019, this has been €8.5 million a year.

Income from the Student Loans (Higher Education) Act of €17.3 million has been taken into account for 2023. Previously decided structural plans were already in place for €14.8 million in 2022. In addition, an annual sum of €0.5 million was made available for short-term projects in which the Student Council takes the lead. The remaining €2.0 million was largely filled with indexing the structural plans already in place. Income from the Student Loans (Higher Education) Act is expected to continue increasing to an amount of €19.1 million in 2024. These funds will be allocated and spent as set out in TU Delft's quality plan. Chapter 6 explains the expenditure and allocations in more detail.

NPO – National Education Programme

The remaining funds from the National Education Programme (NPO) amounted to €4.3 million for education and €4.0 million for research at year-end 2022. These funds are only accounted for when the expenditure has been incurred; the Ministry of Education, Culture and Science allows for this until 2024. The budget thus only considers income that will also be spent in 2023. The representative bodies agreed to this expenditure in 2021. The funds from NPO are explained in more detail in Chapters 2 and 3.

Starting and incentive grants

Funds have been received for starting and incentive grants from 2022 and allocated as non-normative. In 2023, €5.0 million of expenditure is taken into account; the remaining funds received for 2022 and 2023 are earmarked for expenditure in the coming years. Due to the non-normative nature, the timing difference between income and expenditure has no effect on the financial result.

Income from government funding

Income from received tuition fees has increased, largely due to the expiry of the scheme to halve statutory tuition fees that applied as part of the National Education Programme for the 2021/2022 academic year. Compensation was received for this purpose in the 2021 and 2022 government contribution. Rising student numbers are also causing an increase in tuition fees.

Income from the government contribution for 2023 is estimated at €577.5 million, an increase of €1.8 million compared to 2022. Although this increase seems limited, that picture is distorted because of the expiry of the scheme to halve statutory tuition fees, which also meant that the compensation of €18.5 million for this purpose ceased to apply. The new sector plans and starting and incentive grants have also not yet been fully reflected in the budget. This is because the scope and timing of the related expenditure were not fully known when the budget was made. Unlike the current Sector Plans for Science and Technology, the new sector plans and the starting and incentive grants do not have to be recognised as income at the time of receipt, but at the time of expenditure (non-normative components of the government contribution). This makes the moment when the income will be accounted for more uncertain.

Investments

The investments in equipment and inventory in 2023 are estimated at €22 million, and the investments in land and buildings at €109 million. The real estate-related investments are mainly part of the campus strategy and concern several ongoing and new projects. The list of projects is extensive. The largest projects are the seasonal thermal energy storage (STES) for the new Applied Physics building to be built, the further implementation of EEMCS's rehousing and the relocation of Logistics & Environment.

Long-term financial estimate

Besides the development of the student population, real estate plays a significant role in the long-term estimate. The growing student population translates into extra income (government contribution and tuition fees) but also into higher personnel expenses. It should also be mentioned that attracting qualified staff remains a challenge in the tight labour market. The condition of the current buildings, the high maintenance and energy costs associated with them, now and in the future, and the quality and sustainability requirements for today's education and research facilities have led to an extensive investment programme. Facilitating the aforementioned growth also plays a role. The latest insights into real estate requirements were taken into account in preparing the long-term budget. The updated campus strategy was taken as the point of departure. Implementing real-estate plans is under pressure from the nitrogen issue, available raw materials and price rises due to inflation.

The higher government contribution resulting from the Van Rijn Commission recommendations for 2019–2022 will be used primarily to expand the capacity of the teaching academic staff. This paves the way for tackling the problems of work pressure. However, the increasing student numbers will result in an increase in the capacity of academic staff and the necessary support. The new additional resources (Sector Plans and starting and incentive grants) also increase the staffing capacity. This additional capacity must also be able to make use of the appropriate education and research facilities.

Based on the most current estimate, the details of the long-term financial estimate show that the ratios (solvency II ratio, DSCR) will remain within the set limits for the next five years. Based on current estimates, the result from 2025 will be adversely affected by higher depreciation and interest costs because of the occupation of new buildings and increasing debt, respectively.

The overview below shows the estimate for the period 2023–2027, with a glimpse through to 2030.

Statement/Estimate of income and expenditure

<i>in millions of euros</i>	Actual 2021	Actual 2022	Budget 2023	Budget 2024	Budget 2025	Budget 2026	Budget 2027	Expected 2030
Income								
Government contribution	514	576	578	595	610	626	637	681
Other government contributions and subsidies	1	0	-	-	-	-	-	-
Tuition and examination fees	74	71	97	100	103	106	109	116
Income from projects with third parties	206	228	223	251	254	259	264	279
Other income	29	39	30	31	31	32	33	35
Total income	825	914	927	976	998	1,023	1,044	1,111
Expenditure								
Personnel expenses	564	633	692	710	723	735	749	798
Depreciation	43	44	49	41	47	51	63	80
Accommodation expenses	76	84	101	97	92	98	102	114
Other expenses	108	99	119	121	124	126	129	137
Total expenses	791	860	960	970	985	1,011	1,042	1,129
Balance of income and expenses from ordinary business operations	34	54	-33	7	13	12	1	-18
Balance of income and expenses from financial operations	2	-6	3	1	-5	-8	-11	-11
Total result	35	48	-31	8	8	4	-10	-29

It can be concluded from the above long-term budget that the Van Rijn funds will enable TU Delft to partly alleviate the existing financial constraints. After 2023, when faculty reserves will be reduced, the Sector Plan for Science and Technology funds from previous years will be spent, higher energy costs are expected, and a boost is given to university support (including digitisation), limited positive financial results are still expected for the period 2024–2026. However, this is temporary in nature and in line with a still-relevant report by PwC,² in which they concluded that the extra income received by Dutch universities offered little room for investment in facilities and accommodation. According to the PwC report, the positive results mask the underinvestment in people and resources needed for a healthy workload at the desired quality level of education and research.

² PwC research commissioned by the Ministry of Education, Culture and Science, February 2021: Adequacy, efficiency and cost allocation in senior secondary vocational, higher professional and academic education and research (academic education sub-report)

Expected real-estate investments in the 2024–2027 planning period have been incorporated in accordance with the latest campus strategy update. This assumes a total investment of €930 million over the next ten years. The investments include large-scale renovations of buildings and new construction plans for facilities such as laboratories and educational buildings. Depreciation expenses will rise in the longer term because of the necessary investments. Interest expenses will also increase over time because estimates show that borrowed capital is expected to be raised as from 2024. This will result in operating deficits from 2027 onwards. The estimated interest expenses are based on a financing rate of 3%, which does not yet include the most current developments in the financial markets.

The long-term estimate takes the current bases for the government contribution into account. In mid-2022, the Ministry of Education, Culture and Science decided to continue the quality funds after 2024³, even if the student loan system is abolished. These funds are needed to continue financing the structural nature of the expenditure on quality.

Based on historical insights, income from projects with third parties is expected to increase with the growth of the institution. Other income assumes stable revenues, only inflation is taken into account. Incidental income such as the proceeds of the sale of an equity interest by Delft Enterprises of €9.4 million in 2022 is not taken into account.

In conclusion, TU Delft expects positive financial results in the shorter term (the 2024–2026 planning period), but for this to only be a temporary effect. As from 2027, higher real estate-related costs and investments, as well as getting the work pressure in order, will result in declining financial results, expected to reach a loss of €29 million in 2030. In the longer term, there are still also uncertainties regarding future sustainability requirements for investments and macroeconomic developments. This, combined with the continuing growth in student numbers, will put further pressure on the institution's results. According to the current estimates, operational measures will be necessary in the future to remain financially healthy in the longer term without compromising on quality and sustainability.

Lastly, there are several strategic cases that TU Delft would like to develop further. As the effects of this still need to be made more specific, they have not yet been fully quantified in the long-term estimate. The Growth Agenda and Convergence (cooperation with Erasmus University Rotterdam and Erasmus MC) are examples of this. A growth scenario of up to 40,000 students is currently being explored to meet the growing demand for engineers. This also explores the possibility of a multi-campus strategy (possible expansion to The Hague and Rotterdam).

³ In accordance with the 2022 Administrative Agreement on Higher Education and Academia

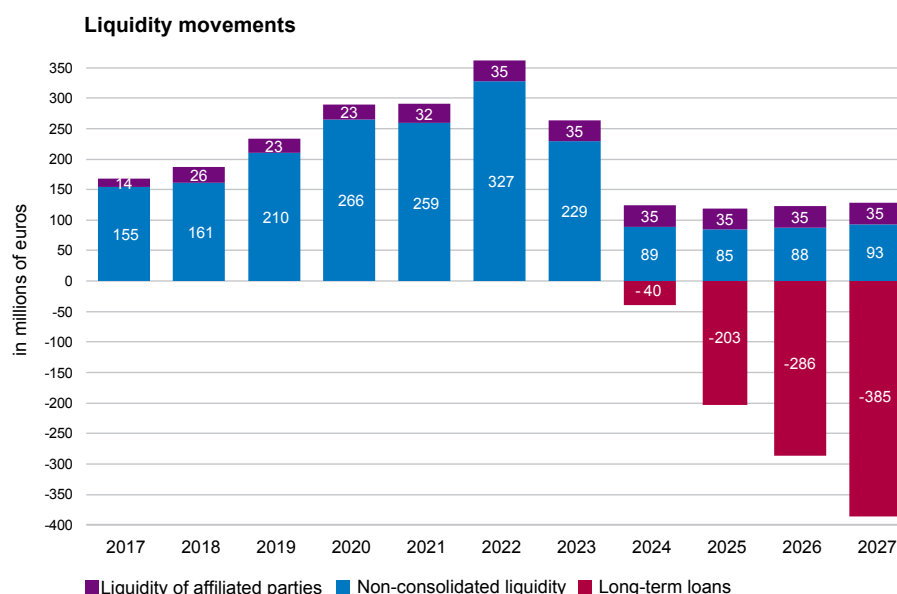
The estimate below shows the balance sheet to be expected for 2023–2027, excluding the strategic files mentioned above:

Raming balans

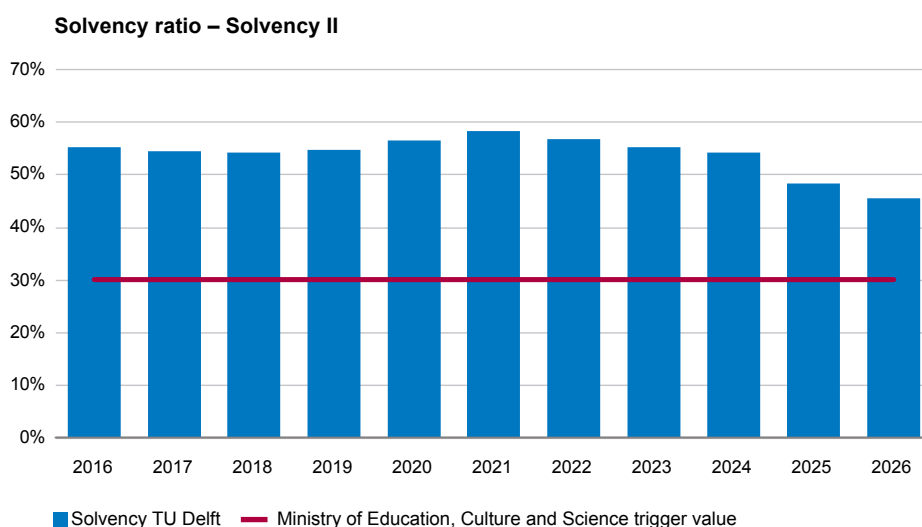
Assets	Actual 2022 M€	Budget 2023 M€	Budget 2024 M€	Budget 2025 M€	Budget 2026 M€	Budget 2027 M€
Fixed assets						
Intangible fixed assets	0	0	0	0	0	0
Tangible fixed assets	614	697	872	1,035	1,117	1,201
Financial fixed assets	12	13	13	13	13	13
	625	710	885	1,048	1,130	1,214
Current assets						
Stock	2	2	2	2	2	2
Receivables	121	121	121	121	121	121
Short-term securities	12	12	12	12	12	12
Liquid assets	362	264	114	110	113	118
	497	399	250	245	248	254
Total assets	1,123	1,109	1,135	1,294	1,378	1,468
Liabilities	Actual 2022 M€	Budget 2023 M€	Budget 2024 M€	Budget 2025 M€	Budget 2026 M€	Budget 2027 M€
Equity capital						
General reserve	511	481	488	496	501	491
Special-purpose reserves	32	32	32	32	32	32
Other reserves/funds	0	0	0	0	0	0
	543	512	520	528	533	523
Provisions	95	97	100	100	99	100
Long-term liabilities	11	11	51	215	303	408
Current liabilities	473	488	465	451	444	437
Total assets	1,123	1,109	1,135	1,294	1,378	1,468

Extensive investments will lead to an increase in tangible fixed assets in the coming years. On the other hand, it will also result in decreasing liquid assets. This trend will continue and will lead to TU Delft having to borrow money from 2024 onwards. There will then no longer be a surplus of financial resources. Following this, a start was already made in 2022 to explore borrowing capacity, including through treasury banking. This will be further explored in 2023.

Liquid assets are shown in the chart below.



Because of negative operating results in the longer term (as from 2027) the solvency II⁴ ratio will decrease. However, as the chart shows, this will remain above the trigger ratio of 30% set by the education inspectorate of the Ministry of Education, Culture and Science.



Equity capital is below the trigger ratio for potentially excessive public equity capital of educational institutions. Equity capital has increased in recent years because of the positive results. It is expected that the result in 2023 and in the years from 2027 will be negative, resulting in decreasing equity capital and thus decreasing equity capital compared to the trigger ratio. Because of this, equity capital will not exceed the trigger value.

⁴ Definition of Solvency II: ((equity capital + provisions)/total liabilities)

8.4 Report on the presence and operation of the internal risk management and control system (part B1)

The university is characterised by the decentralised organisation of science, with a high level of autonomy for scientists and faculties. The university's primary tasks – scientific research and education, and the valorisation of research, as described in the Higher Education and Research Act – are carried out by the faculties. Moreover, universities are open network organisations. The academic staff is connected to global academic networks and thereby also to the global, social and economic environment. Because of these complex networks, planning and decision-making processes at the university require attention and precision in design and compliance.

A broad set of instruments

Universities are largely publicly funded organisations that are required to give a proper account of their actions to society. To achieve the proper planning and accountability within this complex organisation, it is essential that the many internal processes that keep the university in operation are strictly controlled. By virtue of the university's organisational character, TU Delft pays attention to both hard control instruments (e.g. rules and monitoring reports) and soft planning aspects (e.g. shared values and dialogue). To this end, the control instruments are organised into four groups:

- *Culture, behaviour and integrity*
What core values are part of the culture of the organisation? One example would be delivering academic excellence in the name of academic integrity.
- *Communication*
What strategic plans, risks, opportunities, uncertainties and especially global developments are being discussed in various formal and informal discussions?
- *Policy and regulations*
What policy guidelines, laws and regulations are in place to assess activities and to avoid risks?
- *Monitoring and reporting*
What quantitative and qualitative administrative information and information systems are being used to monitor the progress and efficacy of strategic plans? Are we on the right track or are adjustments needed?

Planning and evaluation cycle

The TU Delft internal risk management and control system is an ongoing process, which has a place within the university's planning and evaluation cycle (P&E cycle). This cycle includes administrative consultation between the EB and the dean or manager of the unit. It is a framework that enables the administration of the university to formulate strategic and derived policy objectives, to identify and mitigate risks and opportunities, to monitor processes and to adjust them in a timely manner. Within the P&E cycle, the strategic planning and internal process management is analysed and discussed from the four aforementioned perspectives. It is a structured working method, supported by a system of instruments, systems and agreements, and driven by values, standards and regulations aimed at the realisation of the strategic objectives. As part of the P&E cycle, the EB and the management units make administrative working arrangements, as derived from the 2018–2024 Strategic Framework, supplemented with the 2022–2024 Strategic Priorities. The progress of the administrative arrangements is part of the administrative consultations between the EB and the management units.

Decentralised risk management and control

In addition to central risk management and the continuous dialogue in P&E cycle, risk management tools (including risk matrices) are used in several departments. Risk registers are used for systematic monitoring of risks and special developments. TU Delft applies the Three Lines Model in which the responsibility for risk management is distributed throughout the organisation and differentiated into levels.

The 2018–2024 Strategic Framework includes the aspiration to develop a risk and compliance policy. The EB aspires to have a way of more systematically identifying, controlling and monitoring risks at various organisational levels and in various risk categories, with the aim of dealing with risks and opportunities responsibly in achieving the institution's goals. In this risk management method, risks are assessed for likelihood of occurrence, as well as for the impact that they would have if they were to occur, thus affecting the planned goals. The focus lies increasingly on a broader Enterprise Risk Management (ERM) approach.

The risk management is based on:

- insight into opportunities and risks that influence the organisation's objectives
- control and measures over the risks that put the organisational objectives, including the operational and financial objectives, at risk
- statutory and regulatory compliance
- both internal and external developments affecting organisational objectives
- analyses and measures

For several years, a start has been made on implementing a clear TU Delft risk and control system, as a result of which almost every organisational unit has a heat map and risk register at senior management level.

TU Delft uses ISO31000 as one of its frameworks for risk management. This method focuses on identifying risks and opportunities, based on the organisation's objectives and strategies, which leads to informed decision-making.

The main tactical and strategic risks are identified in terms of probability and impact, complemented by control measures and then recorded in a risk register with responsibility for monitoring and updating within the organisational unit.

Risk management is an ongoing process, which means that continuous attention is required to monitor – and, where necessary, adjust – the risks and control measures. Aided by the risk registers, the organisation ensures the continuous risk management process from which results can also be distilled periodically. By applying this risk and control system, TU Delft is agile and ready for the future.

Specific internal bodies

Internal Audit

Using a systematic and disciplined approach, Internal Audit evaluates the adequacy and effectiveness of governance, risk management and internal control of all activities and resources, as defined by the EB in line with the Code for Good Governance in Dutch Universities. The services of Internal Audit are intended for internal use within TU Delft. The evaluations, research and recommendations provide TU Delft's responsible management with additional assurance and contribute to improvement and change. Internal Audit supports management in analysing, improving and accounting for their operations by contributing to their insights with images, analyses and evaluations. Internal Audit fulfils the third-line role in the execution of its function in accordance with the 'three lines model'. In doing so, Internal Audit plays an important supporting role for the EB, the deans and the directors of TU Delft, helping them to be 'in control' of implementing, improving and accounting for their activities. Internal audit is an independent position.

Audit Committee

The Supervisory Board's Audit Committee advises and supports the Supervisory Board on the effectiveness of the design and operation of the university's internal risk management and control systems. The Audit Committee always focuses on monitoring compliance with relevant laws and regulations, the TU Delft treasury charter and the effect of the integrity code. The Audit Committee is authorised to receive written and oral information about all matters relating to internal risk management and assesses the EB's response in this regard. The Audit Committee thus gains insight into the areas in which the greatest risks are run and into how the EB manages these risks effectively.

Audit by the external auditor

The external auditor's audit report is intended to assess the legitimacy of the financial statements and whether they provide a true and fair view of the financial situation. The certainty that the external auditor provides with this report is important for the discharge procedure, and it supports the Supervisory Board in exercising its responsibility, including ensuring that the funding obtained is lawfully acquired and effectively and lawfully allocated and used. In addition to the audit report, the external auditor provides an auditor's report and a report of interim findings. In these documents, the external auditor reports independently on the quality of the internal management and gives recommendations for improvements to be made. As a basis for the audit of the financial statements, the external auditor conducts an annual risk analysis, in consultation with TU Delft. The external auditor consults periodically with the Audit Committee of the Supervisory Board, the EB, Internal Audit and Finance.

Changes and ambitions for the risk management and control system

In 2021 and 2022, further steps were taken to raise risk awareness by facilitating various risk sessions in the organisation. The aim here was to integrate risk management in existing processes and procedures and apply them on the basis of themes. To achieve Enterprise Risk Management, it is essential for risk management to be explicitly applied in all organisational layers.

The objective was to link the risks and control measures from the risk register more closely to the administrative working arrangements between the EB and the organisational units and to the administrative consultations between the EB and management units as part of the P&E cycle. Information from MiFOCUS (TU Delft's data warehouse) is increasingly being used to support the P&E cycle. This allows the quantitative progress on administrative working arrangements to be monitored and the administrative dialogue to be quantitatively substantiated.

Risk management is also used in a targeted manner in major themes and projects. In 2022, the Minister stated through the National Knowledge Security Guidelines⁵ that risk management should be given a prominent role in institutions. The guidelines are a guide for administrators of knowledge institutions who have to deal with international cooperation, weighing up opportunities with security and other risks. A Knowledge Security programme has been started at TU Delft for this purpose.

Risk management is addressed in various organisational units and management units including our entire real-estate investment programme, sustainability, open science, diversity and integrity, and horizontal supervision. The university is working hard to pay attention to risk awareness and risk management in the various organisational units.

Results of the risk management and control system

The results of the risk management and control system are manifold. Some examples are also highlighted.

The world changed in many ways during 2022. Although the coronavirus pandemic is in its final stages, its effects continue, especially in young people. The study⁶ *'De gevolgen van de coronapandemie voor de gezondheid en het welzijn van de jeugd'* (The impact of the COVID-19 pandemic on the health and wellbeing of youth) conducted by the Netherlands Institute for Health Services Research (NIVEL) and National Institute for Public Health and the Environment (RIVM) shows that the coronavirus crisis adversely affected the physical and mental health of many young people. Many young people started exercising less, eating unhealthier and were more likely to develop symptoms such as depression, anxiety and loneliness.

The war in Ukraine is also having an impact on TU Delft's operating environment. For example, energy costs are rising and inflation is at an all-time high. Various causes and effects seem to be affecting the well-being of staff and students.

The university attaches great importance to the mental and wider health of both students and staff. In addition to our confidential advisers, two ombuds officers, recruited in 2021, at least provide a listening ear.

This year, market prices and the shortage of equipment and personnel in the construction industry, the climate and nitrogen crises, and the need to obtain the right permits, have led us to take appropriate measures by adjusting the investment programme to the ambition of the campus strategy and keeping it manageable. Efforts have been made in many ways to strike the right balance between the substantive ambitions of the primary process, rising costs, meeting sustainability targets, and the available budget.

⁵ <https://www.rijksoverheid.nl/documenten/rapporten/2022/01/14/nationale-leidraad-kennisveiligheid>

⁶ <https://www.rivm.nl/publicaties/gevolgen-coronapandemie-voor-de-gezondheid-en-welzijn-van-de-jeugd#:~:text=Uit%20de%20studies%20blijkt%20dat,als%20depressie%2C%20angsten%20en%20eenzaamheid.>

The labour market is becoming increasingly tight. This has a significant cascade effect, resulting in increased work pressure and stress for existing staff. Several initiatives within the organisation support and assist our employees in this regard. We give our current employees perspective by offering development opportunities through an online platform. Work-life balance is also addressed by including it in discussions with managers so that appropriate measures can be taken. Attracting new employees is also a major focus. Recruitment begins with an active search for potential candidates. They are offered a pleasant working environment with attractive terms of employment. TU Delft also has international childcare facilities for our new foreign colleagues.

Lastly, there are global risks for the research community regarding Open Science and knowledge security. In a letter to the House of Representatives, the government announced a series of measures to increase knowledge security in the Netherlands. This is primarily based on self-regulation by the higher education institutions. A Knowledge Security Program has been established at TU Delft, consisting of several themes on which different organisational units cooperate.

8.5 Description of the most important risks and uncertainties (Part B2)

Internal and external developments mean that the university needs to be agile and better prepared for the future. We operate in an increasingly competitive and rapidly changing environment and although developments in some areas could lead to a short-term increase in risk at a lower level, the risk of not implementing the planned strategic developments could be much higher in the long term.

External risks are beyond the university's control and a separate risk appetite position has not been determined for these risks. Yet external risks will be considered in the overall context of their impact on the other risk categories in the description of the most important risks and uncertainties.

The coronavirus pandemic required us to move quickly as an organisation, for example, by offering online education and making it easier to work from home. Over the past few years, the mental health of both students and staff has also received increased attention. Primary processes are set up to continue in any case. We also maintain a constant focus on the mental health of our students and staff.

The war in Ukraine has us focused on risks related to energy supply, manufacturing, supply-chain processes, and so forth. The impact is mainly seen in rising construction projects and energy prices.

Besides the energy crisis, we were also faced with an increasingly tight labour market in 2022. This trend will continue in the coming years and significantly affect the university's operations.

It remains important to minimise risks relating to reputation, laws and regulations, and finance. Our risk appetite with respect to laws and regulations is very low to zero, as we will comply with their implementation at all times.

At the same time, the university is willing to accept and embrace more risks while pursuing its strategic objectives relating to the primary processes. It is aware that accepting risks is always subject to ensuring that the potential benefits and drawbacks are known.

The table below shows the risks and uncertainties⁷ by risk area according to the classification of the 2018–2024 Strategic Framework. In accordance with the UNL Code for Good Governance 2020, Article 9, paragraph 2, the risk appetite for each risk area is also mentioned.

Risk area	Risks & Uncertainties	Management measure
Concerns all risk areas; Students & Education / Research & Innovation / People & Community / Campus & Services.	<p>Tightness in the labour market has several effects, including:</p> <ul style="list-style-type: none"> • insufficient qualified staff can be recruited • increased work pressure for staff • high turnover of staff changing jobs 	<p>Our organisation is not the only one to be challenged by the tight labour market and the resulting shortage of qualified staff. This means we need to be extra attractive to new staff. That is why we work hard to create an attractive working environment that also offers a job with a future. We do this by offering an inspiring work environment, attractive terms of employment and good working conditions. By offering various initiatives and opportunities such as sports and leisure activities, we try to meet the needs of many. Staff are encouraged to develop in a variety of areas, including participating (for free) through the Learning Hub: an online platform where training and education opportunities are available to all.</p>
Students & Education	Unbalanced increase in students	<p>The Executive Board has turned this risk into an opportunity. Growth has been hard to counter because Dutch law stipulates that we must in principle admit any student with the right papers, based on the idea that education must be accessible to everyone. The labour market also urgently needs more engineers with the knowledge needed to address the social issues of this century, such as climate, energy transition and health challenges.</p> <p>In response, a growth strategy has been initiated that seeks to collaborate with stakeholders and partners in the region. TU Delft aims for a valuable diversity of students and a good balance between Dutch and international students. The quality of our education is leading. To meet high-quality education standards, it is important for the university to focus on its growth strategy.</p>
Students & Education	Being able to provide optimal support for an extensive student experience that addresses both physical and mental health.	<p>The university is committed to providing a challenging and safe environment with the right support so that all students experience an enjoyable and successful study period. Ensuring this is achieved requires investment in teaching and learning facilities and constant updating and revision of the curriculum.</p> <p>We recognise that developing a wider range of educational offerings – including digital, distance and lifelong learning – poses an increased risk and we accept this risk.</p> <p>A student ombuds officer was recruited several years ago to better monitor and mitigate this risk.</p>

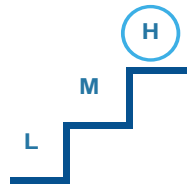
⁷ TU Delft follows Frank Knight's distinction of 'Knightian uncertainty'. This means that some matters mentioned cannot be quantified or can only be quantified to a limited extent.

Risk area	Risks & Uncertainties	Management measure
Research & Innovation	<p>Increasing dependence and complexity in accounting for government funding, indirect funding and contract funding:</p> <ul style="list-style-type: none"> • Government funding: the funding of higher education, including government contributions, is inadequate. • Indirect funding: reducing the remuneration opportunities and budgets. • Contract funding: public-private research collaboration funding is strongly linked to the economic situation. In times of economic recession, this flow of funds is under pressure. 	<p>TU Delft participates in collaborative projects so as to contribute to solving social problems. It aims to maintain a high degree of transparency, accountability and financial control. Indirect and contract funding are usually temporary; current and future income generation from these sources is uncertain and fluctuates.</p> <p>Financial monitoring and planning during the process is a priority. As is the use of flexible capacity to meet grant conditions.</p>
People & Community	<p>High workload and increasing pressure applies to both staff and students.</p>	<p>As it is important to TU Delft for staff to have the time and means to perform their work to the best of their ability, this is one of our priorities that we always discuss during Result & Development Cycle meetings. An Employee Survey is also being conducted to identify areas for improvement that can be tackled to reduce work pressure, among other things. Educational duties are distributed as evenly as possible among the teaching staff.</p> <p>TU staff have the option of hybrid working – if their position allows – enabling them to achieve a better work-life balance.</p> <p>And students are given the opportunity to achieve their ambitions over a longer period, provided that they use their time wisely.</p> <p>Another important measure is the recruitment of staff, where necessary and possible. The university strongly believes it is important to positively engage all stakeholders and provide a safe working environment, by constantly paying attention to raise safety awareness. The university's safety profile provides insight into physical risks and controls, including raising awareness of safe access facilities.</p>
People & Community	<p>Ensuring a safe environment (both physical and mental safety) in a constantly changing world.</p>	<p>In a dynamic and rapidly evolving environment, in which well-being is becoming increasingly important, methods are actively sought to implement actions from the Employee Survey. The university is developing in line with the 2018–2024 Strategic Framework, complemented by the 2022–2024 Strategic Priorities. The latter was drafted as a tightening in response to unforeseen events, such as the coronavirus pandemic.</p>
Campus & Services	<p>Continuously adjusting the campus strategy in an environment that is volatile, uncertain, complex and ambiguous, resulting in the ongoing adjustment of budgets to keep it affordable, ensures the continuity of primary processes and makes us a future-proof and sustainable university.</p>	<p>Striving for sustainability is another of our priorities. The sustainability objective involves additional financial expenses. The development of the campus takes this into account.</p> <p>The university follows structured processes and procedures in which financial planning, budgeting, reporting and control are part of all plans.</p>

Risk area	Risks & Uncertainties	Management measure
Campus & Services	The ability to offer optimal service despite disruption to operations because of staff absences.	<p>The organisation depends on people, mainly the organisational components that contribute to the continuation of the primary processes, but also to a pleasant and safe working and learning environment. Looking ahead, it could be a major risk if we experience long-term staff absences, for example in the aftermath of the coronavirus pandemic.</p> <p>The organisation is preparing for this by providing optimal support for staff, making resources available so they can work healthily. The recruitment of new staff is a constant point of attention to reduce the workload.</p>
Campus & Services	Information security risks and cybersecurity risks	<p>Even before the coronavirus pandemic, there was an increasing dependence on the digital world and available applications (for the primary processes, among other things). The pandemic has accelerated the pace of that dependency. Because of the coronavirus measures, people have switched to working from home, which has increased the probability of cybersecurity incidents.</p> <p>As cyber attacks and data breaches are already on the rise, the research community is paying extra attention to raising awareness about working and storing data safely. The university takes its responsibility for ensuring the security and privacy of the personal data it holds very seriously. Awareness campaigns are used to raise the level of awareness on this topic.</p>
Concerns all risk areas;	Reputational risk resulting from an event.	<p>The university has a good reputation in the area of world-class international and national education, research and valorisation. The events that can lead to reputational risk are very diverse.</p> <p>The control measures therefore concern the regular measures that apply to all identified risks.</p>
Concerns all risk areas; Students & Education / Research & Innovation / People & Community / Campus & Services.	Knowledge security	<p>Knowledge security covers several focus areas (in accordance with the National Knowledge Security Guidelines).</p> <p>These are:</p> <ul style="list-style-type: none"> • Protection of core academic values • Legal frameworks and codes of conduct • Threat assessment and risk analysis • International partnering • Risk management • Cybersecurity <p>TU Delft is developing instruments for all focus areas of the knowledge security programme. A central knowledge security advisory team that staff can approach with questions has been set up in 2023.</p>
Concerns all risk areas; Students & Education / Research & Innovation / People & Community / Campus & Services.	Risks relating to compliance with laws and regulations, integrity and ethics.	<p>The university strives to maintain the highest standards of integrity, compliance and ethics. The university expects all staff to comply with policies and procedures in accordance with codes, laws and regulations, professional standards and research ethics.</p>

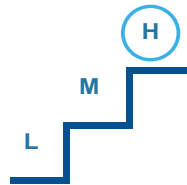
Risk appetite for each risk area

Students & Education/



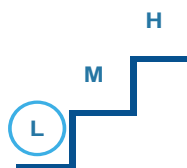
the amount of risk that the university is prepared to accept or retain to achieve its objectives is high, given its statutory duty of providing university education.

Research & Innovation /



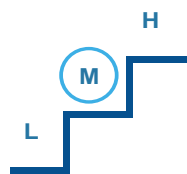
the amount of risk that the university is prepared to accept or retain to achieve its statutory and objectives is high, given its statutory duty of conducting scientific research and transferring knowledge for the benefit of society.

People & Community /



the amount of risk that the university is prepared to accept or retain to achieve its objectives is low because the risks in this risk area have a greater impact on people, society and the organisation.

Campus & Services



the amount of risk that the university is prepared to accept or retain to achieve its objectives must be proportional to the anticipated benefits. The organisation is mostly inclined to accept a moderate level of risk here to achieve acceptable outcomes.

8.6 Report by the supervisory body (Part B3)

The Supervisory Board's report can be found on pages 10-14 of this annual report.

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Appendix 1

Faculties and departments

(overview as of 31 December 2022)

Faculty of Architecture and the Built Environment (A+BE)	
Dean: Prof.ir. D.E. (Dick) van Gameren	
Department	Chair
Architecture	Prof.ir. C.H.C.F. (Kees) Kaan
Architectural Engineering & Technology	Prof.dr.ir. M.T. (Michiel) Kreutzer
Management in the Built Environment	Prof.dr. E.M. (Ellen) van Bueren
Urbanism	Prof.dr. M. (Maarten) van Ham
Faculty of Civil Engineering and Geosciences (CEG)	
Dean: Prof.dr.ir. J.D. (Jan Dirk) Jansen	
Department	Chair
Engineering Structures	Prof.dr. A. (Andrei) Metrikine
Geoscience & Engineering	Prof.dr.ir. T. (Timo) Heimovaara
Geoscience & Remote Sensing	Prof.dr.ir. H.W.J. (Herman) Russchenberg
Hydraulic Engineering	Prof.dr.ir. S.G.J. Aarninkhof
Materials, Mechanics, Management & Design	Prof.dr.ir. L.J. (Bert) Sluys
Transport & Planning	Prof.dr.ir. S.P. (Serge) Hoogendoorn
Water Management	Prof.dr.ir. M.K. (Merle) de Kreuk
Faculty of Electrical Engineering, Mathematics and Computer Science (EEMCS)	
Dean: Prof.dr.ir. L.J. (Lucas) van Vliet	
Department	Chair
Applied Mathematics	Prof.dr.ir. C. (Kees) Vuik
Electrical Sustainable Energy	Prof.dr.ir. M. (Miro) Zeman
Intelligent Systems	Prof.dr. A. (Alan) Hanjalic
Microelectronics	Prof.dr. K.A.A. (Kofi) Makinwa
Quantum and Computer Engineering	Prof.dr. S. (Said) Hamdioui
Software Technology	Prof.dr. A. (Arie) van Deursen
Faculty of Industrial Design Engineering (IDE)	
Dean: Prof.dr.ir. C.G. (Caspar) Chorus	
Department	Chair
Sustainable Design Engineering	Prof.dr.ir. A. (Alessandro) Bozzon
Human-Centered Design	Prof.dr.ir. P.M.A. (Pieter) Desmet
Design Organisation and Strategy	Prof.dr.ir. M.S. (Maaïke) Kleinsmann

Faculty of Aerospace Engineering (AE)	
Dean: Prof.dr. H.G.C. (Henri) Werij	
Department	Chair
Flow Physics and Technology	Prof.dr.ir L.L.M. (Leo) Veldhuis
Control and Operations	Prof.dr.ir. M. (Mirjam) Snellen
Aerospace Structures & Materials	Prof.dr.ir. R. (Rinze) Benedictus
Space Engineering	Prof.dr.ir. P.N.A.M. (Pieter) Visser
Faculty of Technology, Policy and Management (TPM)	
Dean: Prof.drs. A.S. (Aukje) Hassoldt	
Department	Chair
Engineering Systems and Services	Prof.dr.ir. M.F.W.H.A. (Marijn) Janssen
Multi-Actor Systems	Prof.dr. M.E. (Martijn) Warnier
Values, Technology and Innovation	Prof.dr. S. (Sabine) Roeser
Faculty of Applied Sciences (AS)	
Dean: Prof.dr.ir. P.M. (Paulien) Herder	
Department	Chair
Bionanoscience	Dr. S.M. (Martin) Depken
Biotechnology	Prof.dr. J.T. (Jack) Pronk
Chemical Engineering	Prof.dr. B. (Bernard) Dam
Imaging Physics	Prof.dr. S. (Sjoerd) Stallinga
Quantum Nanoscience	Prof.dr. L. (Kobus) Kuipers
Radiation Science & Technology	Prof.dr.ir. J.L. (Jan-Leen) Kloosterman
Faculty of Mechanical, Maritime & Materials Engineering (3mE)	
Dean: Prof.dr.ir. A. (Fred) van Keulen	
Department	Chair
Biomechanical Engineering	Prof.dr.ir. A.C. (Alfred) Schouten
Cognitive Robotics	Prof.dr.ir. J. (Hans) Hellendoorn
Delft Center for Systems and Control	Prof.dr.ir. B. (Bart) De Schutter
Maritime and Transport Technology	Prof.dr.ir. B.J. (Bendiks Jan) Boersma
Materials Science and Engineering	Prof.dr. J. (Joris) Dik
Precision and Microsystems Engineering	Prof.dr.ir. J.L. (Just) Herder
Process and Energy	Prof.dr.ir. C. (Christian) Poelma

Appendix 2

Overview of ancillary activities of the Executive Board, Supervisory Board and Deans

(overview as of 31 December 2022)

Ancillary activities of members of the Executive Board

Tim van der Hagen

Rector Magnificus / President of the Executive Board

Ancillary positions connected to main position:

- Chair of the board of the Leiden-Delft-Erasmus Alliance (LDE)
- Member of the Board of 4TU.Federation Foundation
- Board member of Economic Board Zuid-Holland
- Member of the Supervisory Board of Medical Delta
- Member of the Board of GROW (Growth through Research, Development and Demonstration in Offshore Wind)
- Member of the board of NICAS (Netherlands Institute for Conservation, Art and Science)
- Member of the board of NERA (Netherlands Energy Research Alliance)
- Member of the board of the Delft University Fund
- Member of the Supervisory Board of Theater de Veste, Delft
- Technology and Innovation Committee of VNO-NCW (Confederation of Netherlands Industry and Employers)
- President IDEA League Alliance

Nevenwerkzaamheden:

- Member of COVRA's Supervisory Board (administratively through Van der Hagen Delft B.V.)

Marien van der Meer

Vice President Operations

- Member of the Supervisory Board of the Jeroen Bosch Hospital
- Member of the Board of Bachkoor Holland

Rob Mudde

Vice-Rector Magnificus / Vicechair

- Member of the board of KIVI (Royal Institution of Engineers)
- Member of the Supervisory Board of ISPT (Institute for Sustainable Process Technology)
- Member of the Governing Board of IHE (Delft Institute for Water Education)
- Member of the board of Universities of the Netherlands
- Advisory Committee Studiekeuze123

Ancillary activities of members of the Supervisory Board

Tijo Collot d'Escury

Managing partner Roland Berger BV

- Chair of the Supervisory Board of Delft University of Technology
- Member of the Supervisory Board of Van Leeuwen Buizen Groep B.V., also vice-chair
- Member of the Supervisory Board of the Investment Fund for Health in Africa (IFHA)
- Member of the board of the Social Investor Foundation for Africa
- Member of the board of the Roosevelt Foundation
- Member of the board of the Association for Fauna Conservation in Kloosterzande and environs
- Member of the board of the Collot d'Escury Foundation
- Director of Succia BV
- Member of the board of Vitestro Investors Trust Office Foundation
- Recommendations Committee of Mattheus Passion Delft
- Recommendations Committee renovation Museum Prinsenhof Delft

Luc Soete

Former Rector Magnificus Universiteit Maastricht

- Member of the Supervisory Board of Delft University of Technology, also vice-chair
- Member of the Royal Netherlands Academy of Arts and Sciences (KNAW)
- Member of the Higher Education Efficiency Committee (CDHO)
- Supervisory director of Mediahuis Limburg and independent director of Stichting De Zeven Eycken
- Dean of Brussels School of Governance, Vrije Universiteit Brussel
- Member of the Advisory Board of Sussex Business School, University of Sussex
- Member Economic and Societal Impact of Research and innovation (ESIR) expert group
- Co-chair Scientific Committee of the PRI for the JRC, Sevilla

Carolien Gehrels

Global Director Energy Transition Arcadis

- Member of the Supervisory Board of Delft University of Technology
- Member of the Supervisory Board of Okura Hotel
- Member of the Supervisory Board of EBN
- Member of the board of the Urban Renewal Platform
- Chair Holland Festival
- Chair of the Foundation for More Music in the Classroom
- Member of the Supervisory Board of the Royal Concertgebouw Orchestra
- Member of the Johan Cruyff Foundation

Heleen Wachters

Partner Eden McCallum

- Member of the Supervisory Board of Delft University of Technology
- Member of the CoV of the Netherlands Red Cross, for support in international partnerships

Ancillary activities Decanen

Fred van Keulen

Dean Faculty of Mechanical, Maritime & Materials Engineering (3mE)

- Member of the board Foundation Technical Mechanics
- Member of the Advisory committee Aerospace Vehicles NLR
- Member of the board Foundation TKI HTSM
- Member of the board 4TU.HTM

Dick van Gameren

Dean Faculty of Architecture and the Built Environment

- Advisor to the Municipality of The Hague
- Advisor to Mecanoo Architects
- Advisor to the Committee Aesthetics and Monument Leiden
- Advisor City Council Delft, Investment committee Fund Delft 2040

Aukje Hassoldt

Dean Faculty of Technology, Policy and Management

- Member of the Supervisory Board of TRAIL Research School
- Chairman of the Social Advisory Council of the VNCI (Royal Association of the Dutch Chemical Industry)
- Member of the Steering Committee of Safety Delta Netherlands (Ministry of Infrastructure and Water Management)
- Chair of the National Network for Risk Management

Paulien Herder

Dean Faculty of Applied Sciences

- Member of the board GroenvermogenNL
- Member of the Netherlands Academy of Technology and Innovation
- Member of the board of the Nanoscience Foundation
- Chair of the Energy Taskforce of the Zuid-Holland Economic Board (EBZ)
- Member of the Scientific Sounding Board Committee of the North Sea Consultative Body (NZO-WKC)
- Member of the Supervisory Board of TKI Energy
- Member of the Supervisory Board of The Hague Hotel School
- Member of the Strategic Advisory Council for TNO Energy Transition
- Chair of the DIFFER Institute Advisory Council
- Member of the Energy Top Team (Ministry of Economic Affairs and Climate Policy)
- Member of the HyDelta Sounding Board
- Member of the Dutch Certification Committee for Education for Technological Designer (CCTO)
- Member of the Supervisory Board Foundation Planet B.io
- Member of the monitoring committee Just Transition Fund (Ministry of Economic Affairs and Climate Policy)

Jan Dirk Jansen

Dean Faculty of Civil Engineering and Geosciences (CEG)

- Member of the Mining Council
- Member of the Board J.M. Burgers Centrum (Research School for Fluid Mechanics)
- Member of the Supervisory Board 4TU Centre Resilience Engineering
- Member of the Supervisory Board of the Research School TRAIL
- Member of the Board Molengraaff-fund
- Member of the Board Department Hydrocarbon Technologies & Energy Transition of the Royal Institute of Engineers

Lucas van Vliet

Dean Faculty of Electrical Engineering, Mathematics and Computer Science (EEMCS)

- Member of the Supervisory Board of the Chip Integration Technology Center (CITC)
- Member of the Supervisory Board of HollandPTC Proton Therapy Centre
- Member of the Board of the International Association for Pattern Recognition
- Member of the board of the E.R.R. Fund Foundation
- Member of the board of the Delft University Fund
- Member of the board of Stichting Justus & Louise van Effen Fonds

Caspar Chorus

Dean Faculty of Industrial Design Engineering

- Co-founder, certificate holder and scientific advisor to TU Delft's spin-off Council
- Member of the editorial council of the Journal of Choice Modelling

Henri Werij

Dean Faculty of Aerospace Engineering

- Member of the Advisory Council of the Royal Netherlands Aerospace Centre
- Member of the KNMI Social Advisory Council
- Chair of the DIFFER Scientific Advisory Committee
- Member of the Advisory Council of the Woensdrecht Air Base

Appendix 3

Objections, appeal and complaints

Objections and appeals

In the table below, the number of settled objection and appeal cases (31 objection and 156 appeal) in 2022 is shown divided by category and type of decision. The total number of objections and appeals is 187. This is a sharp decrease of almost 40% compared to the total number of objections and appeals in 2021 (309).

Category	Founded	Unfounded	Inadmissible	Withdrawn	Total
CBE (beroep)	3	11	0	142	156
CBS (bezwaar)	0	7	0	24	31
Promovendi	1	1	0	0	2

The number of appeals handled by the CBE in 2022 has decreased significantly: 156 appeals compared to 255 in 2021, 192 in 2020, 126 in 2019, 148 in 2018, 145 in 2017 and 115 in 2016. A (significant) increase was observed in the numbers every year since 2020. This increase was largely explained by the COVID-19 pandemic, as a result of which much of the teaching and examination took place remotely. The calendar year 2022 - unlike 2020 and 2021 - was not predominantly characterised by the pandemic. The number of 156 appeals therefore falls well between the numbers of 2019 and earlier, although a slight increase can be noted. A large number of CBE cases were withdrawn: 142 in 2022 (a rate of 91 per cent). In 2021, there were 208 (giving a rate of 82 per cent). A large number of withdrawals of CBE cases can be explained by the fact that many foreign students register with several universities and decide to enrol in another programme, after which continuing the appeal is no longer necessary. The amicable settlement procedure also plays a role in the number of appeals withdrawn. For instance, a relatively large number of appeals against decisions on the BSA were settled.

The number of (student) appeals settled in 2022 fell again: 31 compared to 54 in 2021 and 91 in 2020. This decrease can largely be explained by a reduced number of incoming appeals against decisions regarding decentralised selection for numerus fixus programmes: 15 in 2022 compared to 39 in 2021.

The number of settled disputes of PhD students increased from 0 to 2 in 2022. These two disputes included an objection to No Go decision and a complaint. The TU Delft Promotions Disputes Committee handles both objections and complaints from PhD students.

There have been no cases before the Employee Disputes Committee.

Complaints

Complaints about undesirable behaviour

Three complaints were submitted to the Complaints Committee on Undesirable Behaviour (hereinafter KOG) in 2022. Two of these are currently still pending before the KOG. One complaint has been set aside due to the absence of required further information from the complainant..

Complaints about academic integrity

A 2020 complaint was the subject of a final judgment by the Executive Board, after consideration by the LOWI: the two defendants acted negligently, and culpably negligently in one respect, but there was no violation of scientific integrity. This case was partly publicised and a brief account of it is included in section 5.5 (see page 77).

Of the eight complaints filed in 2021, three were finalised: one case was declared unfounded, the other two did not need to be dealt with further due to lack of reasoning and due to withdrawal. One case was adjourned. Four cases were still pending at the end of 2022. Two complaints were filed in 2022: one was withdrawn, the other is still pending.

Whistleblowers

No complaints have submitted or dealt with based on the TU Delft Regulations for Reporting Misconduct (Whistleblower Regulations).

Appendix 4

Clarity notes

Clarity notes

These notes provide further clarification of several accountability items in the annual report, including the outsourcing of teaching duties, the investment of public funds in private activities, exchange agreements with foreign institutions and the development of customised tracks.

Own staff and initial degree programme

Data on the enrolment of staff for an initial degree programme is not aggregated. If this happens, they are very few in number

Outsourcing to private organisations

The degree programmes registered in the CROHO are provided by the institution itself, with several programmes provided fully or partially with fellow universities. There is no outsourcing to private organisations. TU Delft uses no public funds for private educational activities.

Granting of exemptions

Exemptions are granted by the Board of Examiners and are processed with the date of approval of the exemption.

Use of public funds in private activities

With effect from 1 January 2022, the Policy Rule on Investing with Public Funds in Private Activities is in force. However, the accountability as included in the policy rule, has been postponed to the reporting year 2023. In close consultation with the auditor, TU Delft is working in anticipation on an inventory of activities that could (potentially) qualify as private activities. The inventory has not yet revealed any activities that appear to violate the policy rule. Activities such as contract research, participations in start-up companies and partnerships with other universities have been assessed as activities that fit within the university's public tasks. In 2023, TU Delft is still working on and sorting out the implications of the policy rule investing with public funds in private activities. This elaboration will include whether the activities of Delft Enterprises B.V. should be classified as private or public equity.

Tailored tracks

There are no paid tailored tracks for external organisations and/or companies in the existing degree programmes.

Following modules

Some students follow programme modules without intending to actually obtain the final degree certificate. These students belong to the HBO bridging student group and are enrolled in Bachelor's courses to follow bridging programmes under an agreement with the Ministry.

Emergency fund

An emergency fund exists for students with financial problems. The emergency fund is only used in exceptional cases, always involves a loan and in all cases involves costs other than tuition fees, such as hospital costs. Tuition fees are never reimbursed. It is not possible to follow a programme other than that for which you are enrolled at TU Delft.

Other programmes

Following a course other than that for which enrolled is not an issue at TU Delft.

Exchange agreements

TU Delft has exchange agreements with a broad range of foreign knowledge institutions. All incoming and outgoing exchanges were cancelled in the 2020/2021 academic year because of the coronavirus pandemic. An overview of the knowledge institutions with which TU Delft has an exchange agreement can be found at <https://www.tudelft.nl/studenten/ondersteuning/study-internship-abroad/university-exchange-partners-networks>

Financial statements 2022

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9 CONSOLIDATED FINANCIAL STATEMENTS

9.1 Consolidated balance sheet as at 31 December 2022

Amounts in thousands of euros (after appropriation of result)

		31-12-2022 K€	31-12-2021 K€
Assets			
Fixed assets			
Tangible fixed assets	1	613,529	585,550
Financial fixed assets	2	11,651	10,108
Total fixed assets		625,180	595,658
Current assets			
Inventories	3	2,081	2,416
Accounts receivables and other receivables	4	121,298	114,358
Current securities	5	12,122	12,978
Cash and cash equivalents	6	361,982	290,755
Total current assets		497,483	420,507
Total assets		1,122,663	1,016,165
Equity and liabilities			
Group equity	7	543,031	494,935
Provisions	8	95,278	96,667
Long-term liabilities	9	11,019	11,126
Current liabilities	10	473,335	413,437
Total equity and liabilities		1,122,663	1,016,165

9.2 Consolidated statement of income and expenses for the year 2022

Amounts in thousands of euros

		Realization 2022 K€	Begroting 2022 K€	Realization 2021 K€
Income				
Government funding	11	575,738	543,289	514,450
Other government funding and subsidies	12	155	0	1,026
Tuition and examination fees	13	71,350	73,217	74,252
Income from work commissioned by third parties	14	227,533	215,782	206,096
Other income	15	38,950	25,038	28,901
Total income		913,726	857,326	824,725
Expenses				
Personnel expenses	16	633,175	621,921	564,145
Depreciation	17	44,443	48,795	42,744
Accommodation expenses	18	83,500	78,757	76,346
Other expenses	19	98,718	119,598	107,775
Total expenses		859,836	869,071	791,010
Operating result		53,890	-11,745	33,715
Financial income and expenses	20	-1,429	-20	1,522
		52,461	-11,765	35,237
Taxes	21	-10	108	62
		52,451	-11,657	35,299
Result from participations	22	-4,195	0	0
Result after taxes		48,256	-11,657	35,299
Minority interest	23	-19	-13	-27
Net result		48,237	-11,670	35,272

9.3 Consolidated cash flow statement for the year 2022

Amounts in thousands of euros

	2022		2021	
	K€	K€	K€	K€
Cash flow from operating activities				
Operating result		53,890		33,715
<i>Adjustments for</i>				
Depreciation	44,443		42,744	
Result from participating interests	-9,830		-3,928	
Change in provisions	-1,389		11,472	
Change in deferred taxation	-52		-76	
Conversion of loan into capital	-5,000		0	
Other income and expense items without cash flow	805		-6,252	
		28,977		43,960
<i>Changes in current assets</i>				
Inventories	335		-1,430	
Accounts receivable and other receivables	-6,940		11,508	
Current securities	856		-740	
Current liabilities	59,898		1,686	
Other cash flows	0		-2,178	
		54,149		8,846
		137,016		86,521
Cash flows from operating activities				
Interest received	30		1,872	
Dividends	729		350	
Change in value of financial fixed assets	-1,837		-700	
Interest paid	-351		0	
Income tax paid	-10		62	
Minority interest	-19		-27	
		-1,458		1,557
Total operating activities		135,558		88,078
Cash flow from investment activities				
Investments in tangible fixed assets	-76,226		-91,846	
Change in loans as part of financial fixed assets	38		6	
Proceeds from the disposal of tangible fixed assets	4,000		25	
Other changes in tangible fixed assets	-196		-45	
Change in participations	-1,569		-373	
Other changes in participations interest	-127		-354	
Disposal of participating interests	9,997		6,436	
Total investment activities		-64,083		-86,151
Cash flow from financing activities				
Change in reserves	-160		-134	
Third-party interest in consolidated parties	19		27	
Long-term liabilities	-107		-132	
Total financing activities		-248		-239
Change in cash and cash equivalents		71,227		1,688
Movement in cash and cash equivalents				
Cash and cash equivalents at the beginning of the period	290,755		289,067	
Change in cash and cash equivalents	71,227		1,688	
Cash and cash equivalents at the end of the period	361,982		290,755	

9.4 General notes to the consolidated balance sheet and statement of income and expenses

Entity information

Business address from and trade register number

The registered and actual address of Delft University of Technology is Stevinweg 1, 2628 CN in Delft. Delft University of Technology is registered at the Chamber of Commerce under number 27364265.

General notes

Activities

Delft University of Technology (TU Delft) has been granted its legal form based upon Section 1.2 of Book 2 of the Dutch Civil Code and Section 1.8 of the law for Higher Education and Research (WHW).

The statutory duty of the university is described in Section 1.3.1 of the WHW: Universities are responsible for providing scientific education and conducting scientific research. In any case they provide initial degree programmes in scientific education, conduct scientific research, train scientific researchers and technical designers and transfer knowledge for the benefit of society.

Going concern

The financial statements, and the accounting principles and policies used, have been prepared in accordance with the going concern assumption.

Estimates

In order to be able to apply the principles and rules for preparing the financial statements, the management of the institution must form an opinion on various matters, and the management must make estimates which can be essential for the amounts included in the financial statements. If necessary for providing the insight required in Book 2, Section 362, paragraph 1 of the Dutch Civil Code, the nature of these opinions and estimates, including the corresponding assumptions, has been included in the notes to the relevant items of the financial statements.

The valuation method of the provision for anniversary benefits has been refined in 2022. This accounting estimate relates to the allocation method regarding the 40 year anniversary. Based on the likelihood of employment duration, a provision is formed, from the first year instead of 25 years.

Due to agreements made in 2022 regarding the personnel implementation regulation, based on new insights and risk assessment, the provision formed in 2021 was released.

TU Delft is pursuing an extensive investment programme for renewal of its educational and research facilities. A decision to sell off or demolish a building has implications for the valuation of these existing buildings.

Consolidation

The consolidation includes the financial statements of the institution, its group companies and other institutes over which it has control or which are under its central management. Group companies are legal entities over which the institution can exercise control, directly or indirectly, due to the fact that it holds the majority of the voting rights or can control the financial and operational activities in any other way. Potential voting rights that can be exercised on the balance sheet date are also taken into account.

The head of the group is TU Delft in Delft. The financial statements of the institute are included in the consolidated financial statements of TU Delft in Delft.

The group companies and other legal entities over which the institution can exercise control or which are under its central management are fully consolidated. The third-party interest in the group equity and the group result is stated separately. Participating interests over which no control can be exercised (associates) are not included in the consolidation.

In case of a joint venture, the relevant interest is proportionally consolidated. A joint venture is deemed to exist if, as a result of a collaboration agreement, the control is exercised jointly by the participants.

Intercompany transactions, intercompany profits and mutual claims and debts between group companies and other consolidated legal entities are eliminated, when as the results have not been realised through transactions with third parties outside the group. Unrealised losses on intercompany transactions are also eliminated unless an impairment is applicable. Accounting principles of group companies and other consolidated legal entities have, where needed, been amended in order to conform with the current accounting principles for the group.

Along with associates, several participating interests which are individually and jointly of immaterial significance are not included in the consolidation.

Acquisitions and disinvestments of group companies

With effect from the acquisition date, the results and the identifiable assets and liabilities of the acquired institution are included in the consolidated financial statements. The acquisition date is the date from which control can be exercised over the institution concerned.

The acquisition price is the sum of money (or equivalent) agreed for the acquisition of the institution, plus any directly allocatable costs. If the acquisition price is higher than the net fair value of the identifiable assets and liabilities, the excess amount will be capitalised as goodwill under intangible fixed assets. If the acquisition price is lower than the net fair value of the identifiable assets and liabilities, the difference (negative goodwill) will be recorded under accrued liabilities.

The companies involved in the consolidation will remain in the consolidation until they are sold; deconsolidation takes place when control is transferred.

General accounting policies

General

The consolidated financial statements have been prepared in accordance with the Dutch Annual Reporting Regulation for Education, Part 9, Book 2 of the Dutch Civil Code, and Section 660 of the Dutch Accounting Standards and the authoritative statements in the other sections of the Dutch Accounting Standards, issued by the Foundation for Annual Reporting, and with the regulations of the Public and Semi-public Sector Senior Officials (Standard Remuneration) Act (WNT).

Assets and liabilities are generally stated at their acquisition or manufacturing price or current value. If no specific accounting policy is specified, valuation is based on the acquisition price. References are included in the balance sheet, the statement of income and expenses and the cash flow statement.

These references refer to the explanatory notes.

The financial statements are presented in euros and in thousands, unless stated otherwise.

Comparison with previous financial year

The accounting principles for valuation and determination of results have not changed compared to the previous reporting year.

Foreign currency

Assets and liabilities denominated in foreign currency are translated into euros at the exchange rate prevailing on balance sheet date. Gains and losses arising from transactions in foreign currencies are translated at the exchange rate prevailing on transaction date. All exchange rate differences are accounted for in the statement of income and expenses.

Changes in accounting principles

The accounting principles for valuation and determination of results have not changed compared to previous year.

Financial instruments

Financial instruments comprise of investments in shares and bonds, trade and other receivables, cash, loans and other financing obligations, trade and other payables

Financial instruments are initially stated at fair value. Financial instruments that are not part of the trading portfolio are stated at amortised cost on the basis of the effective interest method, minus impairment losses.

Currency risk

The institution operates primarily in the Netherlands. The currency risk for the institution mainly relates to positions and future transactions in US dollars. Based on a risk analysis, the Board of the institution has determined that some of these currency risks are to be covered. Forward exchange contracts are used for this purpose.

Interest rate risk and cash flow risk

The institution is subject to an interest rate risk on the interest-bearing receivables (mostly regarding financial fixed assets, securities and cash and cash equivalents) and interest-bearing long-term and short-term liabilities (including debts to credit institutions).

Credit risk

The institution does not bear any significant credit risk.

Accounting policies for the valuation of assets and liabilities

Tangible fixed assets

Land and buildings

Buildings and land are stated at their acquisition price, including additional costs or the manufacturing price minus straight-line depreciation throughout the estimated useful life. Land is not subjected to depreciation. Impairments expected at the balance sheet date have been taken into account. For guidance regarding when a tangible fixed asset is subject to impairment, refer to the paragraph below: Impairments of fixed assets.

Category fixed asset	Annual depreciation rate
• Land and roads	0 - 3.33%
• Completed buildings	1.7 - 6.67%

Other fixed assets are stated at their acquisition or manufacturing price value including direct allocatable costs, minus straight-line depreciation throughout the expected useful life. Impairments expected at the balance sheet date have been taken into account. For guidance when a tangible fixed asset is subject to impairment, refer to the paragraph below: Impairments of fixed assets.

The manufacturing price consists of the acquisition price of raw materials and consumables including additional (installation) costs which can be attributed directly to the manufacture. If a considerable amount of time is needed to prepare for manufacture, the interest costs are also included in the manufacturing price.

Investments in 2th/3th funding projects are capitalised in the year of purchase and are directly and fully part of the cost of the project.

Investments in equipment and inventory of less than K€ 25 as well as expenditures on books and artworks, are directly accounted for in the statement of income and expenses.

Category fixed asset	Annual depreciation rate
• Equipment and inventory	10 - 33.33%

Major maintenance costs are capitalised according to the component method. Major maintenance is defined in line with the Dutch Accounting Standards. TU Delft has a threshold amount of K€ 150 for capitalisation. TU Delft rents out part of its space to third parties. Rental income is included as other income in the statement of income and expenses.

Financial fixed assets

Participations

Participations in which significant influence can be exercised are valued according to the equity method (net asset value method). When 20% or more of the voting rights can be exercised, significant influence is assumed.

The net asset value is calculated according to the accounting principles that apply for these financial statements; for participations for which insufficient details are available for adjustment to these principles, the accounting principles of the participations concerned are used. If, according to the net asset value, the valuation of a participation is negative, this participation is valued at zero.

If and to the extent that the institution guarantees in whole or in part the liabilities of the participation, or has the firm intention of enabling the participation to settle its debts, a provision is created for this. The initial valuation of purchased participation is based on the fair value of the identifiable assets and liabilities at the time of acquisition. For the subsequent valuation, the accounting principles that apply to these financial statements are applied, based on the values of the initial valuation. The result is recorded as the amount by which the book value of the participation has changed since the previous financial statements as a consequence of the result achieved by the participation.

Participations in which no significant influence can be exercised are stated at their acquisition price. If there is a permanent impairment, valuation occurs at the realisable value; downward valuation changes are charged to the statement of income and expenses. The participating interests of Delft Enterprises B.V. are stated at cost or lower market value. An exit strategy is maintained for the participating interests. The policy states that the participating interest will be disposed of in due course (the aim is a period between five and ten years).

Participating interests

The participating interests of Delft Enterprises B.V. are stated at cost or if applicable lower market value.

Receivables from participations

Receivables included under financial fixed assets are initially stated at fair value after deduction of transaction costs (if material). These receivables are subsequently stated at amortised cost, taking into account any value reductions.

Deferred tax assets

Deferred tax assets are recognised for unused tax losses and deductible temporary differences between the value of the assets and liabilities measured for tax purposes and according to the accounting principles applied in these financial statements to the extent that it is probable that future taxable profits will be available against which temporary differences and losses can be utilised.

The deferred tax assets are measured using the tax rates applicable at the end of the reporting year or when applicable at the enacted rates for the coming year. Deferred tax assets are stated at nominal value.

Other Receivables

Other receivables included under the financial fixed assets consist of loans granted and other receivables. These receivables are initially stated at fair value. Subsequently these loans and bonds are stated at amortised cost. Impairments are deducted from the amortised cost and directly accounted for in the statement of income and expenses.

Impairment of fixed assets

At balance sheet date, the institution assesses if indications exist whether a fixed asset is subjected to impairment. When indications exist, the realisable value of the asset is determined. If it's not possible to determine the realisable value for the individual asset, the realisable value of the cash flow generating unit to which the asset belongs is determined. An impairment exists if the book value of an asset is higher than the realisable value; the realisable value is the higher of the net realisable value and the value in use. An impairment loss is recorded as an expense in the statement of income and expenses while reducing the book value of the asset concerned.

If it's established that a previously recorded impairment no longer exists or has decreased in value, the increased book value of the asset concerned is not set higher than the book value that would have been determined if no impairment had been recorded for the asset.

Inventories

Inventories are valued at cost as determined by acquisition price according to the FIFO (first in, first out) method or net realisable value, whichever is lower. The net realisable value is the estimated selling price less directly allocable selling expenses. Obsolete inventories are taken into account when determining the net realisable value.

Cryptocurrency

The Faculty of Electrical Engineering, Mathematics and Computer Science (EWI) has a research group known as the Delft Blockchain Lab (DBL), which focuses on research and education in the field of blockchain technology. This research group participates in the national collaboration, known as the Dutch Blockchain Coalition.

To enable the investigation of blockchain initiatives, TU Delft holds a limited number of bitcoins. The bitcoins are valued at cost, given the high volatility of this cryptocurrency.

Fissile material

The Reactor Institute Delft (RID) is part of the faculty of Applied Sciences (TNW) and the Dutch knowledge centre for scientific research and education in the field of radiation. The RID manages a research reactor that serves as a neutron and positron source for research instruments. Nuclear fuels are used to keep the nuclear reactor operational. The fissile materials are valued at cost price.

Receivables

Receivables are initially recognized at fair value based on amounts exchanged and subsequently at amortised cost. Trade receivables are valued at amortised cost after initial valuation and have a maximum duration of a year. Provisions for doubtful receivables are deducted from the book value of the receivable.

The balance arising from projects with third parties results in a receivable or a debt on the balance sheet. Projects with prepaid expenses that exceed the instalments invoiced in advance are included under receivables. Projects with instalments invoiced in advance that exceed the prepaid expenses are included under liabilities. Any additional own contribution deemed necessary for a project arising from projects performed with third parties is deducted.

Current securities

Current securities that are a part of the trading portfolio are stated at fair value. TU Delft includes the direct transaction costs attributable to the purchase of shares and obligations in the statement of income and expenses. Changes in value are directly accounted for in the statement of income and expenses.

Current securities classified as current assets have a duration of less than one year.

Cash and cash equivalents

Cash and cash equivalents consist of cash, bank balances and deposits with a duration of less than twelve months. Current account debts with banks are included under current liabilities. Cash and cash equivalents are stated at nominal value.

Equity

Equity consists of general and statutory reserves and funds for special purposes.

The statutory reserves are reserves with a restricted disbursement of funds, as imposed by the Board.

Minority interests

Minority interests as part of the group equity are stated at the amount of the net interest in the net assets of the group companies concerned.

If a group company concerned has a negative net asset value, the negative value together with any further losses is not charged to the minority interest, unless the third party shareholders have a constructive obligation and are able to bear the losses. As soon as the net asset value of the group companies becomes positive once again, results are allocated to the minority interest.

Provisions*General*

Provisions are recognized for present legal or constructive obligations arising from past events, for which an outflow of economic benefits is probable and a reliable estimate of the amount can be made.

Provisions are stated at the best estimate of the amounts necessary to settle the liabilities at balance sheet date. Other provisions are stated at the nominal value of the expenditures expected to be required to settle the liabilities, unless stated otherwise.

If a third party is expected to compensate for the liabilities and it's probable that the compensation will be received upon settlement of the liability, than the compensation will be included as an asset on the balance sheet.

Provision for anniversary benefits

The provision for anniversary benefits is stated as the cash value of the expected payments in the course of the employment. The expected salary increases and the likelihood of employment duration are taken into consideration in the calculation of the provision. In calculating the present value, a discount rate of 2% has been applied (2021: 1.5%).

Asbestos provision

The asbestos provision concerns the future costs of removing asbestos within TU Delft buildings. The provision is valued at present value with a discount rate of 2% (2021: 1.5%).

Sewer system provision

In the calculated sewer system provision a discount rate of 2% has been applied (2021: 1.5%)

RID dismantling provision

The provision for dismantling the RID concerns a present value of the expected future costs of dismantling the RID.

Other provisions

Other provisions are stated at nominal value of the expenditures deemed necessary for the settlement of the provision.

Current liabilities

Current liabilities are initially stated at fair value. Current liabilities are subsequently stated at amortised cost, which is determined by the amount received, taking into account premiums or discounts and after deduction of transaction costs. This is usually the nominal value.

Leasing

Operational leasing

Lease contracts might be applicable in the institution for which many of the advantages and disadvantages of ownership are not the responsibility of the institution. These lease contracts are recorded as operational leasing. Lease payments are included in the statement of income and expenses on a linear basis for the duration of the contract, taking into account the payments received from the lessor.

Financial instruments and risk management

Financial instruments comprise of investments in shares and bonds, trade and other receivables, cash, loans and other financing obligations, trade and other payables.

Financial instruments are initially stated at fair value. After initial valuation the financial instruments not included in the trading portfolio are stated at amortised cost based on the effective interest method, minus impairment losses.

Currency risk

The institution operates primarily in the Netherlands. The currency risk for the institution mainly relates to positions and future transactions in US dollars. Based on a risk analysis, the Board of the institution has determined that some of these currency risks are to be covered. Forward exchange contracts are used for this purpose.

Interest rate risk and cash flow risk

The institution is subjected to an interest rate risk on the interest bearing receivables (mostly regarding financial fixed assets, current securities and cash and cash equivalents) and interest bearing long term and short term liabilities (including debts to credit institutions).

Credit risk

The institution does not bear any significant credit risk.

Accounting policies for valuation of statement of income and expenses

General

Income and expenses are recognised in the applicable book year. Results are only recognised when realised at balance sheet date. Losses and risks originating before the end of the reporting year are recognized, provided that they have become known before the adoption of the financial statements.

Government funding

Government funding is recognised as revenue in the statement of income and expenses in the applicable year. The costs associated with the granted non-normative government funding have been recognised in the statement of income and expenses. The not utilized part is included as liability in the balance sheet.

Other government funding and subsidies

Subsidies attributable to the statement of income and expenses are recognised as revenue in the year in which the subsidised costs were incurred or revenue was lost, or when a subsidised operating deficit occurred. Revenue is recognised when receipt is probable and the institution can demonstrate the conditions for receipt.

Subsidies related to investments in tangible fixed assets are deducted from the asset concerned and included as part of the depreciation in the statement of income and expenses or deferred as amounts received in advance.

Project revenues and project costs

For projects of which the result can be reliably determined, the project income and project costs are stated as net turnover and costs in the statement of income and expenses in proportion to the progress made at balance sheet date. The progress of the performance completed is determined as the ratio between the realised project costs as of balance sheet date and estimated total project costs.

If the result at balance sheet date cannot be estimated reliably, the revenues will be recorded as net turnover in the statement of income and expenses up to the amount of the realised project costs. The result is determined as the difference between project revenues and project costs. Project revenues are the contractually agreed revenues, revenues from additional or reduced work, claims and reimbursements, if and to the extent that it's probable that these will be realised and if a reliable estimate of the amount can be made.

Project costs are the costs directly related to the project, the costs that are generally attributed to project activities and can be attributed to the project, and other costs contractually attributable to the commissioning party.

All the projects of TU Delft are budgeted as 'budget neutral', which means that the costs are equal to the income generated. If a part of the costs are not covered by 2th /3th funding, TU Delft allocates an own contribution in the project budget. The own contribution is recognised in the statement of income and expenses based on the progress of the performance completed.

If the total project costs are likely to exceed the total project revenues, the expected losses will be immediately included in the statement of income and expenses. For TU Delft, project revenues represent a structural contribution to the financial result, TU Delft has a wide variety in subsidy arrangements. The agreed upon project conditions serve as guidelines for determining the result.

Revenue recognition

Rendering services

Revenues attributable to the provision of services are accrued in proportion to the services delivered, based on the services rendered up at balance sheet date in relation to the total services to be rendered.

Goods sold

Income from the sale of goods is recognised when the significant risks and rewards of ownership of the goods are transferred to the buyer.

Gifts

Income received in the form of goods or services is stated at fair value.

Other Income

Other income comprises income from rental, sale, secondment, contribution by third parties and other income.

Depreciation of intangible and tangible fixed assets

Intangible and tangible fixed assets are depreciated as of the month following the date of first use over the expected future useful life of the asset. Land is not depreciated. If there is a change in the estimate of the future useful life, the future depreciations are adjusted accordingly. Gains and losses from the non-recurring sale of material fixed assets are included in the statement of income and expenses.

Employee benefits

Periodic remuneration

Wages, salaries and social security contributions are included in the statement of income and expenditures on the basis of employment conditions as far as they classify as payables to employees or the tax authorities.

Pensions

The institution has a pension scheme with ABP Pension Fund. This pension scheme is subject to the Dutch Pensions Act, and contributions are paid by the institution on a compulsory or contractual basis. The pensionable salary at ABP is based on the average wages during an employee's working career. ABP tries to raise the pensions each year by the average wage increase in the government and education sectors. Indexation is possible at a coverage ratio of 110% or more. Indexation does not take place at a coverage ratio between 104% and 110%. If the coverage ratio falls below 104%, the pension fund must take measures. The contributions are stated as personnel costs when they become payable. Prepaid contributions are included as prepayments if they result in a repayment or a reduction in future payments. Contributions that have not been paid accordingly are included in the balance sheet as current liabilities. No further liabilities remain after the contributions have been paid.

As of 31 December 2022, the policy-funding ratio of the ABP Pension Fund is 118.6%.

Exceptional items

Exceptional items are income or expenses arising from events or transactions that are part of the ordinary operations but which, for the purpose of comparison, are explained separately on the basis of the nature, scope or non-recurring nature of the item.

Financial income and expenses

Interest income and interest expenses

Interest income and interest expenses are included on a time-proportionate basis, taking into account the effective interest rate of the respective assets and liabilities.

Dividends

Dividends received from participations and current securities that are not accounted for at net asset value are recognised as soon as TU Delft has acquired the applicable rights.

Exchange rate differences

Exchange rate differences that arise due to the settlement or translation of monetary items are recorded in the statement of income and expenses in the period in which they arise. Transactions in foreign currency carried out during the reporting period are included in the financial statements at the exchange rate applying on the transaction date.

Taxation

The taxation is calculated over the result before taxation in the statement of income and expenses, taking into account the available, offset table taxation losses from previous financial years (unless they are included in the deferred tax assets), exempt profit components and after the addition of non-deductible expenses. Also changes that occur in the deferred tax assets and deferred tax liabilities as a result of changes in the applicable tax rate, are taken into account.

Result from participations

The result from participations is the amount by which the book value of the participation has changed since the previous financial statements as a consequence of the result attributable to the participation.

Accounting policies for the valuation of cash flow statement

Cash flow statement

The cash flow statement is prepared in accordance with the indirect method. The cash amounts in the cash flow statement consist of the cash and cash equivalents, excluding deposits with a term of more than three months. Cash flows in foreign currencies have been converted at an estimated average rate. Receipts and payments on interest and dividends received have been included in the cash flow from operating activities. The acquired financial interests have been included in the cash flow from investing activities. Changes in the reserves and minority interests in consolidated parties are included under cash flow from financing activities.

9.5 Notes to the consolidated balance sheet

Assets

Fixed assets

1 Tangible fixed assets

	31-12-2022 K€	31-12-2021 K€
Land and roads	74,356	65,603
Completed buildings and installations	397,284	339,119
Building and installations under construction	40,632	94,789
Equipment and inventory	65,845	56,363
Advance payments	35,412	29,676
	<u>613,529</u>	<u>585,550</u>

Tangible fixed assets	Land and roads	Completed buildings	Building and installations	Equipment and inventory	Advance payments	Total
Balance as at 1 January 2022						
Cumulative purchase cost	74,279	859,856	94,789	251,048	29,676	1,309,648
Accumulated depreciation	-8,676	-520,737	0	-194,685	0	-724,098
Book value as at 1 January 2022	<u>65,603</u>	<u>339,119</u>	<u>94,789</u>	<u>56,363</u>	<u>29,676</u>	<u>585,550</u>

Investments	0	26,371	12,918	7,344	29,593	76,226
Transfer to land and roads	9,967	0	-9,967	0	0	0
Transfer to completed buildings	182	59,410	-55,073	0	-4,519	0
Transfer to equipment and inventory	0	0	-1,298	20,636	-19,338	0
Depreciation	-1,220	-24,782	0	-18,441	0	-44,443
Disposals	0	-4,000	0	-4,677	0	-8,677
Depreciation on disposals	0	0	0	4,677	0	4,677
Other changes	-176	1,166	-737	-57	0	196
Balance movements	<u>8,753</u>	<u>58,165</u>	<u>-54,157</u>	<u>9,482</u>	<u>5,736</u>	<u>27,979</u>

Balance as at 31 December 2022						
Cumulative purchase cost	84,242	941,456	40,632	274,425	35,412	1,376,167
Accumulated depreciation	-9,886	-544,172	0	-208,580	0	-762,638
Book value as at 31 December 2022	<u>74,356</u>	<u>397,284</u>	<u>40,632</u>	<u>65,845</u>	<u>35,412</u>	<u>613,529</u>

Land, Roads and buildings

- Campus Zuid

The amount for land and roads includes a value of M€ 20 with regard to the Campus Zuid area. The current value of buildings and land has not been determined.

- Sale object Mijnbouwkunde

In 2022 the sale and transfer of object Mijnbouwstraat, with a initial book value of €4 million, was completed. This resulted in a sales result of €1 million for this year.

- Land development

The University develops land for the allocation of plots of leasehold land. These costs are capitalised and depreciated over the term of the lease after the plots have been allocated. The leases acquired are included under long-term liabilities and, also during the term of a long-term lease, are released to the income statement. This is included separately under the item other changes.

- Collateralization

Related to the financial security for the dismantling of the Reactor Institute Delft (RID), there is a mortgage right on the buildings Landbergstraat 15 and Mekelweg 2 at Delft.

Equipment and inventory

- Books / media collection

Purchases with the purpose of maintaining the collection of the university library are charged to the operating account in the year of purchase. In 2022 this concerned an amount of M€ 7,9 (2021: M€ 8,0).

Advance payments

Some of the other movements have a connection from the past due to a research asset that was initially valued as a research project but actually concerns a tangible fixed asset. This correction is not significant, therefore the figures of the previous years have not been adjusted.

2 Financial fixed assets

				31-12-2022 K€	31-12-2021 K€
Participations				4,737	2,795
Participating interests				5,940	5,956
Loans				37	2,581
Deferred tax assets				937	809
				<u>11,651</u>	<u>10,108</u>

	31-12-2021 K€	Additions K€	Disposals K€	Result K€	31-12-2022 K€
Participations					
Bioprocess Pilot Facility B.V.	0	0	0	0	0
Blue Sparrows Medtech Finance B.V.	69	0	0	0	69
Chrysalix RoboValley US Limited Partners	214	131	0	-26	319
Dutch Greentech Fund B.V.	358	20	0	-2	376
FORWARD.one Fund II Coöperatief U.A.	0	33	0	-7	26
Graduate Entrepreneur Fund Cooperatief U.A.	18	34	0	-9	43
GeoThermie Delft	0	1,141	0	-1,141	0
HollandPTC B.V.*	0	5,000	0	-4,195	805
ICOS Cleantech Early Stage Fund II B.V.	93	0	0	0	93
Innovation Industries Fund II Cooperatief U.A.	61	23	0	-4	80
Mainport Innovation Fund B.V.	1,075	29	0	0	1,104
Mainport Innovation Fund II B.V.	167	14	0	1	182
ROM InnovationQuarter B.V.	428	427	0	0	855
Shift Invest III Cooperatief U.A.	17	62	0	-17	62
Shift Invest Cooperatief U.A.	159	23	0	-5	177
Teggwins IA B.V.	400	0	0	0	400
TUD Beijing Institute WFOE	76	0	0	0	76
Thuja Capital Healthcare Fund III Coöperatief UA	0	38	0	-10	28
UNIIQ B.V.	11	0	0	9	20
VINwater	22	0	0	0	22
YES! Delft	0	0	0	0	0
Total	<u>3,168</u>	<u>6,975</u>	<u>0</u>	<u>-5,406</u>	<u>4,737</u>

* During 2022 the M€ 5 loan to HollandPTC is converted into share equity. This capital injection resulted in the release of the negative provision, which is shown on the balance sheet in result from participations.

Participations					
Adjuvo Motion B.V.	156	0	0	0	156
ADR Technology B.V.	250	0	0	0	250
Allotropica Technologies Inc.	0	0	0	0	0
APTA Technologies B.V.	25	0	0	0	25
Battolyser B.V.	0	0	0	0	0
BIOND Solutions B.V.	147	0	0	0	147
Blue Phoenix Group B.V. (sold)	10	0	-10	0	0
BlueBee Holding B.V. (sold)	0	0	0	0	0
BlueGen. ai	0	51	0	0	51
C2CA Technology B.V.	4	0	0	0	4
CarbonX B.V.	308	0	0	0	308
CFS GreenX Holding B.V.	0	0	0	0	0
City Analytics	0	25	0	-25	0
Clear Flight Solutions B.V.	0	0	0	0	0
CloudCuddle B.V.	112	0	0	0	112
CognitiveIC B.V.	0	0	0	0	0
Cool Separations B.V.	296	25	0	0	321
Council B.V.	61	0	0	0	61
CFS GreenX Holding B.V.	0	0	0	0	0
CyberHydra Holding B.V.	0	25	0	0	25

	31-12-2021	Additions	Disposals	Result	31-12-2022
	K€	K€	K€	K€	K€
DE-Birds B.V.	0	0	0	0	0
Delft Advanced Biofuels B.V.	137	0	0	0	137
Delft IMP B.V.	360	0	0	0	360
Delmic B.V.	476	0	0	0	476
DENSsolutions B.V.	100	0	0	0	100
Enevale B.V.	68	40	0	0	108
Eculture B.V.	0	60	0	0	60
EXO Ligament B.V.	100	25	0	-25	100
Fastree3D B.V.	0	0	0	0	0
Field Factors B.V.	20	0	0	0	20
Fizyr B.V.	357	0	0	0	357
Flapper Drones B.V. (liquidated)	0	0	0	0	0
FlexSol Building Solutions B.V.	150	0	0	0	150
GBM Works B.V.	60	0	0	0	60
Gilbert Technologies B.V.	0	0	0	256	256
Green Basilisk B.V.	274	150	0	0	424
Hardt Group B.V.	150	0	0	0	150
HOMIE B.V.	0	0	0	0	0
IMSystems Holding B.V.	150	0	0	0	150
Innatera Nanosystems B.V.	0	200	0	0	200
Interactive Robotics B.V.	18	0	0	0	18
Magneto B.V.	34	80	0	0	114
Mayht B.V. (sold)	263	0	-263	0	0
Metropolder B.V.	0	0	0	0	0
MEZT B.V.	3	0	0	0	3
Mobile Canal Control B.V.	0	0	0	0	0
Muetech B.V.	0	50	0	0	50
Nature's Principles B.V.	21	0	0	0	21
OfficeVitae B.V.	0	0	0	0	0
Ore Energy B.V.	0	51	0	0	51
ParaPy Holding B.V.	60	0	0	0	60
PATS Indoor Drone Solutions B.V.	125	0	0	0	125
PHYSEE Group B.V.	20	0	0	0	20
Plotwise (Clint Holding) B.V.(sold)	166	0	-166	0	0
Populytics B.V.	10	0	0	0	10
PV Works B.V.	1	0	0	-1	0
Pholtaire B.V.	0	13	0	0	13
Qblox B.V.	100	0	0	0	100
QdepQ Systems B.V. (liquidated)	250	0	0	-250	0
Qphox	90	0	0	0	90
Qualinx B.V.	188	400	-400	0	188
QuantWare Holding	100	0	0	0	100
Respyre B.V.	15	0	0	0	15
Sandgrain B.V.	0	0	0	0	0
Scrapscanner B.V.	50	0	0	0	50
Slimy Green Stuff B.V. (liquidated)	0	0	0	0	0
SolvGE B.V.	0	0	0	0	0
Stokhos B.V.	0	0	0	0	0
Soundcell Holding B.V.	0	30	0	0	30
Sourcer Holding B.V.	0	50	0	0	50
STAND IP B.V.	0	20	0	-20	0
Teller B.V. (liquidated)	250	0	-88	-162	0
Tiler B.V.	138	0	0	0	138
TUDesc B.V.	0	1	0	-1	0
Urban Mining Corp B.V.	257	141	0	-398	0
Vertigo Technologies B.V.	0	0	0	0	0
VibroTwist B.V.	0	0	0	0	0

	31-12-2021	Additions	Disposals	Result	31-12-2022
	K€	K€	K€	K€	K€
Villari B.V.	35	76	0	0	111
VSParticle B.V.	0	0	0	0	0
Wegain B.V.	0	0	0	0	0
Whiffle Holding B.V.	0	0	0	0	0
Zero Energy Development	15	0	0	0	15
Total	5,980	1,513	-927	-626	5,940
Loans					
Study and student associations Foundation	25	0	-5	0	20
Laboratoriumvlieg-tuig NLR/ TU Delft	34	0	-34	0	0
Student Emergency Fund	16	1	0	0	17
Total	75	1	-39	0	37

Study and student associations

Concerns three long-term interest-free loans. Nothing has been agreed with regard to collateral.

Foundation Laboratoriumvliegtuig NLR/ TU Delft

In 2011, an interest-free loan was granted to Foundation Laboratoriumvliegtuig NLR/TU Delft. The foundation requires this loan in order to reinvest in an aircraft cockpit for research purposes at TU Delft. The principal of the loan is K€ 341 and will be fully repaid in 2022. Nothing has been agreed with regard to collateral.

Student Emergency Fund

An emergency fund exists for students with financial problems. The emergency fund is only used in exceptional cases, always involves a loan and in all cases involves costs other than tuition fees, such as hospital costs. Tuition fees are not reimbursed.

Deferred tax assets

	31-12-2021	Additions	Disposals	Result	31-12-2022
	K€	K€	K€	K€	K€
Deductible temporary differences	721	159	0	0	880
Available carry-forward of losses	164	0	-107	0	57
Total	885	159	-107	0	937

Deferred tax assets have arisen from deductible temporary differences and available carry-forward of losses in the consolidated parties of the wholly-owned participation TU Delft Services B.V.

Deductible temporary differences

This item concerns a temporary valuation difference in the book value of the buildings Yes!Delft 1 and Yes!Delft Labs due to the minimum book value being reached. These properties are owned by the consolidated party: Technostarters Delft Vastgoed B.V.

Available carry-forward of losses

This item arose as a result of the future probability of taxable profits within the tax group of the following consolidated parties: Delft Projectmanagement B.V., FlexDelft B.V., FlexDelft Detacheringen B.V., Technostarters Delft Vastgoed B.V. and Suenso Molengraaffsingel B.V.

Current assets

3. Inventories

	31-12-2022 K€	31-12-2021 K€
Consumer goods	2,081	2,416

During the year more inventory is used than purchased, this caused a decrease in the inventory position.

4. Accounts receivables and other receivables

Accounts receivables	21,432	15,530
Receivables relating to government funding	0	900
Prepaid expenses of multi-year projects and grants	72,100	74,008
Other receivables, prepayments and accrued income	27,766	23,920
	<u>121,298</u>	<u>114,358</u>

Accounts receivables

Receivables on accounts receivable	25,626	16,996
Receivables on related parties	94	1,318
	<u>25,720</u>	<u>18,314</u>
Provision for doubtful debts	-4,288	-2,784
	<u>21,432</u>	<u>15,530</u>

Accounts receivable include receivables aged over one year up to an amount of K€ 1,843 (2021 K€ 2,727).

Receivables relating to government funding

BaMa compensation	0	900
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BaMa compensation

The claim on the Ministry of Education, Culture and Science concerns compensation for missing out on funding as a result of the introduction of the bachelor-master structure in the period 2003-2008.

In 2022, a repayment of K€ 900 was received (2021: K€ 2,402), and everything was compensated.

Prepaid expenses of multi-year projects and grants

Prepaid expenses of projects and grants with a debit balance	466,209	395,764
Progress payments	-358,674	-290,730
Contingency own contribution	-35,435	-31,026
	<u>72,100</u>	<u>74,008</u>

The term of the receivable depends on the degree of advance funding by these external funders. These receivables have a term of more than one year.

	31-12-2022	31-12-2021
	K€	K€

Other receivables, prepayments and accrued income

Tuition and examination fees	58	97
Advances to staff	388	88
Prepaid amounts	16,657	14,264
Interest receivable	1,058	0
Amounts to be charged	8,655	9,421
Funds to be received for Professional Learning Communities	950	50
	<u>27,766</u>	<u>23,920</u>

5. Current securities

The movements of the current securities are as follows:

Book value as at 1 January	12,978	12,238
Purchase	6,701	2,398
Sale	-5,407	-2,853
Revaluation	-2,150	1,195
Book value as at 31 December	<u>12,122</u>	<u>12,978</u>

This concerns the portfolios of Foundation Het Lammingafonds of K€ 2,607 and Foundation Nanoscience TU Delft of K€ 9,515. The current securities portfolio consists of K€ 4,706 in shares and K€ 7,416 in bonds, and is at the free disposal of the legal entities.

6. Cash and cash equivalents

Cash in hand	17	42
Cash at bank	40,581	44,341
Current account treasury banking	321,384	246,372
	<u>361,982</u>	<u>290,755</u>

All cash and current account balances are at free disposal by TU Delft and its consolidated entities.

The interest paid on these accounts is variable and linked to the development of the Euribor-rate and the interest rate policy of commercial banks.

The interest rate on the current account treasury banking is based on EONIA fixing. In case of negative interest rates, this interest rate is equalled to zero.

Equity and liabilities

7. Group equity

Group equity

	31-12-2022 K€	31-12-2021 K€
General reserve	511,249	467,255
Statutory reserves (public)	-7,751	-4,132
Statutory reserves (private)	15,736	6,728
Special-purpose fund (private)	23,518	24,823
Minority interest*	279	260
	<u>543,031</u>	<u>494,935</u>

*) This concerns the non-controlling in Yes!Delft B.V.

The proportion of equity in Yes!Delft is divided as follows: 60% TU Delft Services B.V. (2021: 60%)
20% Municipality of Delft (2021: 20%)
20% TNO Deelnemingen B.V. (2021: 20%)

Group equity Technische Universiteit Delft

	31-12-2022	31-12-2021
Balance as at 1 January	494,675	459,537
Result for the financial year	48,237	35,272
Other charges	-160	-134
Balance as at 31 December	<u>542,752</u>	<u>494,675</u>

	Balance as at 1-1-2022 K€	Proposed result K€	Other changes K€	Balance as at 31-12-2022 K€
General reserve				
General reserve	467,255	44,155	-160	511,250
	<u>467,255</u>	<u>44,155</u>	<u>-160</u>	<u>511,250</u>
Statutory reserves (public)				
TU Delft Services B.V.	-4,899	-3,178	0	-8,077
LDE Alliance	768	-442	0	326
	<u>-4,132</u>	<u>-3,620</u>	<u>0</u>	<u>-7,751</u>
Statutory reserves (private)				
Delft Enterprises B.V.	6,728	9,007	0	15,735
	<u>6,728</u>	<u>9,007</u>	<u>0</u>	<u>15,735</u>
Special-purpose fund (private)				
Foundation Nanoscience TU Delft	12,431	-1,201	0	11,230
Foundation Het Lammingafonds	3,131	-548	0	2,583
Consolidated foundations TU Delft Services B.V.	9,261	444	0	9,705
	<u>24,823</u>	<u>-1,305</u>	<u>0</u>	<u>23,518</u>
	<u>494,675</u>	<u>48,237</u>	<u>-160</u>	<u>542,752</u>

Group equity Technische Universiteit Delft

	Balance as at 1-1-2022 K€	Proposed result K€	Other changes K€	Balance as at 31-12-2022 K€
General reserve				
General reserve	438,398	28,991	-134	467,255
	438,398	28,991	-134	467,255
Statutory reserves (public)				
TU Delft Services B.V.	-6,262	1,363	0	-4,899
LDE Alliance	1,484	-716	0	768
	-4,778	646	0	-4,132
Statutory reserves (private)				
Delft Enterprises B.V.	3,677	3,051	0	6,728
	3,677	3,051	0	6,728
Special-purpose fund (private)				
Foundation Nanoscience TU Delft	11,529	902	0	12,431
Foundation Het Lammingafonds	2,836	295	0	3,131
Consolidated foundations TU Delft Services B.V.	7,875	1,386	0	9,261
	22,240	2,583	0	24,823
	459,537	35,271	0	494,675

General reserve

This relates to equity without specific spending restrictions and is therefore freely disposable. As of June 1, 2022, foundation Enterprises Accounting was disbanded and activities have been transferred to TU Delft Services B.V. In 2021 the other changes include the parking revenues regarding Campus-Zuid which were not recorded in accordance with laws and regulations at an earlier stage. It's not a material misstatement therefore error recovery is not applicable.

Statutory reserves

This concerns the reserves formed based on an Executive Board decision intended for specific expenditures on education and research at the faculties and services.

public

- Related to the public activities of TU Delft Services B.V.
- Resources made available in context of the partnership between Leiden University, TU Delft and Erasmus University Rotterdam (LDE).

private

Related to the private activities of Delft Enterprises B.V. In 2023 the TU Delft is still analyzing the impact of the policy 'Investeren met publieke middelen in private activiteiten'. In this analysis the classification of the activities regarding Delft Enterprises, whether they are private or public, will be taken into account.

Special-purpose funds

These reserves are formed because of restrictions in spending, imposed by third parties.

private

- Foundation Nanoscience TU Delft: the promotion of scientific research in the area of nanoscience, in particular within the Kavli Institute of Nanoscience Delft of Delft University of Technology.
- Foundation Het Lammingafonds: financial support to research projects, within the hydraulic domain of Civil Engineering, which are significant for developing countries.
- Related to the private activities of TU Delft Services B.V.

	31-12-2022 K€	31-12-2021 K€
Minority interest		
Balance as at 1 January	260	233
Change to minority interest	19	27
	<u>279</u>	<u>260</u>

Profit appropriation

Provisions on the appropriation of profit in the statutes

TU Delft has no statutes of foundation. Therefore, provisions on the appropriation of profit under the articles of association are not applicable.

The result of K€ 48,237 (positive) is appropriated as follows:

Addition to the general reserve	44,155
Addition to the statutory reserve	9,007
Withdrawal from statutory reserve	-3,620
Addition to special-purpose funds	0
Withdrawal from special-purpose funds	-1,305
	<u>48,237</u>

Equity

Reconciliation of company and consolidated equity capital

Equity in company financial statements	528,937
Equity of Foundation Nanoscience TU Delft	11,230
Equity of Foundation Het Lammingafonds	2,585
	<u>542,752</u>
Equity of minority interest	279
Equity in consolidated financial statements	<u>543,031</u>

Result

Reconciliation of company and consolidated result

Result in company financial statement	49,985
Result Foundation Nanoscience TU Delft	-1,201
Result Foundation Het Lammingafonds	-548
Result in consolidated financial statements	<u>48,237</u>

Subsequent events

No significant subsequent events have occurred since the balance sheet date on the result and assets of TU Delft at the end of 2022.

8, Provisions

	31-12-2022 K€	31-12-2021 K€
Staff provisions	30,179	34,258
Student provisions	2,117	1,912
Miscellaneous provisions	62,982	60,497
	<u>95,278</u>	<u>96,667</u>

Staff provisions

	31-12-2021 K€	Release K€	Allocation K€	Utilisation K€	31-12-2022 K€
Redundancy pay	10,673	-3,026	4,054	-3,129	8,572
Sabbatical leave	1,822	-335	410	0	1,897
Recalibration	296	0	35	-96	235
Reorganisation	375	-53	0	-92	230
Anniversary benefits	10,231	-1,322	1,616	-776	9,749
Transitional provision	6,644	-528	1,284	-1,281	6,119
Own risk insurance ZW-flex	468	-491	786	-392	371
Own risk insurance WGA	3,749	-1,376	974	-341	3,006
Total	<u>34,258</u>	<u>-7,131</u>	<u>9,159</u>	<u>-6,107</u>	<u>30,179</u>

Redundancy pay

This concerns the provision for future payments to (former) employees who claim or are eligible to claim benefits under the redundancy pay scheme.

Sabbatical leave

This concerns the provision for the liabilities related to sabbatical leave.

Recalibration

This provision was created to fund the organisational changes resulting from the review process. Provisions are valued at net present value, taking into account a wage indexation of 4% per year and a discount rate of 2%.

Reorganisation

This provision relates to the liabilities arising from the reorganisation in respect of the organisational units. Provisions are valued at net present value, taking into account a wage indexation of 4% per year and a discount rate of 2%.

Anniversary benefits

Concerns the provision for the liabilities related to anniversary bonuses. Provisions are valued at net present value, taking into account a wage indexation of 4% per year and a discount rate of 2%. The valuation method of the provision for anniversary benefits has been refined in 2022. This accounting estimate relates to the allocation method regarding the 40 year anniversary. Based on the likelihood of employment duration, a provision is formed, from the first year instead of 25 years.

Transitional provision

This concerns the provision for future transition payments to employees on termination of temporary employment of 2 years or more.

Own risk insurance ZW-flex

These concern provisions for future benefit payments to employees and former employees under the Sickness Benefit Act (ZW).

Own risk insurance WGA

These concern provisions for future benefit payments to employees and former employees under the Return to Work (Partially Disabled Persons) Regulation (WGA). Provisions are valued at net present value, taking into account a wage indexation of 4% per year and a discount rate of 2%.

Student provisions

	31-12-2021	Release	Allocation	Utilisation	31-12-2022
	K€	K€	K€	K€	K€
Student Financial Support Fund	1.912	0	2.084	-1.879	2.117
Total	1.912	0	2.084	-1.879	2.117

Concerns the provision for the liabilities related to the financial support of students, whom incurred a study delay due to special circumstances.

Miscellaneous provisions

	31-12-2021	Release	Allocation	Utilisation	31-12-2022
	K€	K€	K€	K€	K€
Fissionable materials	3.200	0	575	-109	3.666
Asbestos	19.869	0	1.346	-1.498	19.717
Sewer system	2.679	-287	63	-995	1.460
RID Dismantling	29.324	0	3.390	0	32.714
Other	5.425	0	0	0	5.425
Total	60.497	-287	5.374	-2.602	62.982

Fissionable materials

This provision is made up of the costs arising from the disposal and storage of fissionable materials. The amount is determined according to the nature of the individual activities of disposal and storage and is calculated by an internal specialist on the basis of external contracts (COVRA).

Asbestos

In the provision for asbestos removal, the amount is based on an inventory of the whole TU Delft campus, with costs calculated per building on the basis of empirical data for each type of asbestos. The actual expenditures relating to asbestos depend on the coordination of asbestos removal with demolition and renovation programmes. The provision is carried at net present value, with a discount rate of 2%.

Sewersystem

TU Delft has included a provision to replace the sewer systems in the coming years because of their poor condition. The provision is carried at net present value, with a discount rate of 2%.

RID Dismantling

Based on the Nuclear Energy Act, TU Delft is a licensee of the Reactor Institute Delft (RID), as referred to in Article 15b of the Nuclear Energy Act. As of April 1, 2011, an amendment to the Nuclear Energy Act in force in which (among other things) an obligation for the license holders of nuclear power plants and reactors is included to provide financial security to propose the costs that are associated with the decommissioning and decommissioning of a nuclear power plant or reactor by the license holder. For financial security, two TU Delft buildings are subject to a mortgage.

A provision for the future dismantling of the RID has been formed in the annual accounts, to which is doped annually according to time-proportional use. The RID removal provision is periodically tested. The last time in 2020, no changes of a material nature have arisen from this.

Other

This consists of several provisions created from contractual obligations that TU Delft has committed to in the past and that relate to projects in the context of realizing the campus vision.

	Balance K€	< 1 year K€	1 - 5 year K€	> 5 year K€
Balance breakdown				
Staffprovisions	30,179	7,545	15,693	6,941
Student provisions	2,117	1,228	889	0
Miscellaneous provisions	62,982	3,651	14,590	44,741
	95,278	12,424	31,172	51,682

9. Long-term liabilities

	31-12-2022 K€	31-12-2021 K€
Long lease ground rent	11,019	11,126

10. Current liabilities

Accounts payable	1,747	140
Turnover tax	1,042	1,984
Payroll tax	24,406	22,922
Pension contributions	6,972	6,592
Advance payments for multi-year projects and grants	193,163	200,761
Accruals and deferred income	246,005	181,038
	473,335	413,437

The current liabilities all have a remaining duration of less than one year. The fair value of current liabilities approximates the book value because of their short-term nature.

Advance payments for multi-year projects and grants

Progress payments	572,123	533,150
Prepaid expenses of projects with a credit balance	-378,071	-339,611
Contingency own contribution	-889	7,222
	193,163	200,761

The duration of the amounts received in advance depends on the degree of advance payment by these external financiers and may have a maturity of more than one year.

Accruals and deferred income

Accrued holiday entitlements	33,712	21,907
Amounts payable	67,826	74,696
Tuition and examination fees received in advance (1 January - 31 August)	48,550	31,669
Holiday allowances payable (1 June - 31 December)	14,906	14,133
Gravitation programme earmarked funds	8,339	7,672
Gravitation programme funds still available: Bèta & Techniek 2*	5,653	0
Gravitation programme funds still available: Starters- en stimuleringsbeurzen*	5,738	0
Gravitation programme funds still available: Frontiers of Nanoscience	2,219	8,454
Gravitation programme funds still available: Building a Synthetic Cell	1,433	1,668
Advance payments received for coordination activity	50,853	13,122
Advance payments	6,776	7,717
	246,005	181,038

* The Gravitation programme funds: Bèta & Techniek 2 and Starters- en stimuleringsbeurzen are additional government allocations from The Ministry of Education, Culture and Science classified as 'not normative government funding'. The still available allocations in 2022 are passivated on the balance sheet.

Model G: Accounting for subsidies

Amounts in thousands of euros

G1. Accounting for subsidies of which the unused part, if activities have been fully completed, can be used for other government funded activities.

Description	Allocation		The performance in line with the subsidy decision, the activities have been fully completed at year end:
	Reference	Date	
Open and online higher education 2018-2022: OLMO	OO20-08	29-4-2020	N
Open and online higher education 2018-2022: HANDZONE	OO22-13	28-4-2022	N
Open and online higher education 2018-2022: eWaterCycle	OL22-08	28-4-2022	N

G2A. Accounting for subsidies that have to be spent entirely for the applicable purpose, ending at the reporting year.

Description	Allocation		Amount of allocation	Received up to 2021	Total subsidy costs up to 2021	Balance as of 1 januari 2022	Received in 2022	Subsidy costs in 2022	To be settled as of 31 december 2022
	Reference	Date							
Coronabaten in het hoger onderwijs	COHO-210038	13-04-2021	420,342	420,342	172,478	247,864	0	0	247,864
		Total	420,342	420,342	172,478	247,864	0	0	247,864

G2B. Accounting for subsidies that have to be spent entirely for the applicable purpose, continuing into the following reporting year.

Description	Allocation		Amount of allocation	Received up to 2021	Total subsidy costs up to 2021	Balance as of 1 januari 2022	Received in 2022	Subsidy costs in 2022	To be settled as of 31 december 2022
	Reference	Date							
Not applicable			0	0	0	0	0	0	0
		Total	0	0	0	0	0	0	0

Commitments and contingencies

Reactor Institute Delft

TU Delft is the licence holder of the Reactor Institute Delft (RID), in accordance with Section 15b of the Nuclear Energy Act. On 1 April 2011, an amendment to the Nuclear Energy Act took effect, which (among other things) obliges licence holders of nuclear plants and reactors to provide financial security for the costs related to the shutdown and dismantlement of the nuclear plant or reactor by the licence holder. For the purpose of this financial security, two buildings of the TU Delft have been secured by a mortgage. The final agreement for the financial security is in consultation with the involved Ministries following the approval in 2022 on the reassessed dismantle plan.

At the end of 2022, a provision of M€ 32,7 (2021: M€ 29,3) for the future dismantling of the RID is included in the financial statements. Annually an allocation is made, proportional to the period of use.

Investment obligations

At the end of the financial year, TU Delft has outstanding investment obligations equivalent to M€ 17,8 (2021: M€ 20,4).

Guarantees for HollandPTC B.V.

TU Delft is a guarantor for one-third of the actual loans granted to HollandPTC B.V. by the European Investment Bank (EIB). The guarantee relates to 33.33% of the remaining principal amount including interest and other associated costs. Due to a higher market interest compared to the agreed upon interest the costs for early repayment are estimated at zero.

At year end 2022 a loan amount of M€ 71,4 has been withdrawn by HollandPTC at the EIB. This corresponds with a guarantee of M€ 25,9 for interest and repayments (2021: M€ 32,0) for TU Delft.

Quantum Technology (QuTech)

TU Delft signed a covenant for strategic partnership with the Minister of Economic Affairs, the Minister of Education, Culture and Science, the Netherlands Organisation for Applied Scientific Research (TNO), the Netherlands Organisation for Scientific Research (NWO) and Foundation TKI HTSM regarding the field of quantum technology (QuTech). The covenant has a duration until 1 July 2025.

The resulting financial obligation for TU Delft is an in kind contribution of M€ 3 (2021: M€ 3) per year and a cash contribution of approximately M€ 3 (2021: M€ 3) per year.

VAT on overhead costs

Delft University of Technology is in a conversation with the Dutch Tax and Customs Administration about the claimed tax receivable relating to overhead costs from financial year 2019 and further. TU Delft and the Dutch Tax and Customs Administration have the intention to bring this case to court in order to obtain clarity. The outcome of this procedure cannot be predicted in advance. Furthermore, the Dutch Tax and Customs Administration has partially agreed to accommodate the point of view from TU Delft.

The numerical effect of the concession for the year 2019 and further must be further aligned with the Dutch Tax and Customs Administration and is estimated at this moment at M€ 10.

Lease obligation

At the end of this financial year, TU Delft has no operational lease obligations outstanding (2021: K€ 0).

9.6 Notes to the consolidated statement of income and expenses

In 2022 TU Delft obtained a positive operational result of M€ 48.2 compared to a budgeted deficit of M€ 11.7. The operational result is highly influenced by several incidents, including the sales result of the equity interest by Delft Enterprises of M€ 9.4, release of the earlier formed personnel liability of M€ 7.4 and a re-evaluation of the accountability for the Zwaartekracht program with M€ 5.6.

The government and other funding contributions increased in 2022 with an amount of M€ 60.4 to a total amount of M€ 575.9. The most important effects for this increase relate to a higher loan- and price compensation due to the collective labour agreement (CAO) developments. Furthermore, not normative government contributions account for a higher income of M€ 7.2, and the already mentioned reevaluation of the Zwaartekracht Program.

The realised tuition fees amount M€ 71.4 compared to M€ 74.2 in 2021.

The decrease is caused due to a halving of the legislative tuition fees for college year 2021/2022. The lower income is compensated in the government funding.

Income from work commissioned by third parties increased with M€ 21.4 to M€ 227.5, because of more project activities and a higher result from completed projects.

Total personnel costs have risen to M€ 633.1. This is the result of more fte's and because of an increase in the collective labour agreement (CAO) of 4% as of 1 July 2022 and an one-time disbursement set by the collective labour agreement of € 750 per fte for employees with minimum wages and €400 per fte for all the other employees.

The deprecation costs have slightly increased with M€ 1.7 to M€ 44.4.

The accommodation expenses have increased from M€ 7.2 to M€ 83.5 compared with last year. This is caused by the higher energy prices due to geopolitical tension.

The other expenses have declined with M€ 9.0. This is explained by the revision of an impairment regarding the loan to HollandPTC B.V. and as a result of in 2022 made agreements regarding the personnel implementation regulation it is no longer necessary to maintain the in 2021 formed liability, this lead to a release of M€ 7.4 and because of a higher VAT (pro rata) restitution of M€ 3.8.

Income

	Realization 2022 K€	Budget 2022 K€	Realization 2021 K€
Government funding	575,738	543,289	514,450
Other government funding and subsidies	155	0	1,026
Tuition and examination fees	71,350	73,217	74,252
Income from work commissioned by third parties	227,533	215,782	206,096
Other income	38,950	25,038	28,901
	913,726	857,326	824,725

11. Government funding

Government grants	575,738	543,289	514,450
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Government funding

Government funding Ministry of Education, Culture and Science*	512,741	543,289	484,396
Other allocations	68,834	0	37,256
From (+) to (-) balance sheet	-5,837	0	-7,202
	575,738	543,289	514,450

* As of the financial year 2008, TU Delft has acted as an intermediary for the Government allocations for the IHE Delft Institute for Water Education. In 2022 this amounted to M€ 11,9. This amount is not included in the item Government funding M€ 575,8, as this has been transferred to IHE Delft Institute for Water Education.

Other allocations

Gravity program: Frontiers of Nanoscience	1,433	0	2,933
Gravity program: Building a Synthetic Cell	0	0	1,543
Quality agreements (Wet Studievoorschot)	16,018	0	12,464
Sectorplan Bèta & Techniek	12,582	0	12,188
Sectorplan Bèta & Techniek 2	6,030	0	0
National education program	26,930	0	8,126
Starters- en stimuleringsbeurzen	5,738	0	0
BaMa compensation, price adjustment	103	0	2
	68,834	0	37,256

From (+) / To (-) balance sheet

Gravity program: Frontiers of Nanoscience	6,235	0	-188
Gravity program: Building a Synthetic Cell	235	0	408
National education program	-916	0	-7,422
Starters- en stimuleringsbeurzen	-5,738	0	0
Sectorplan Bèta & Techniek 2	-5,653	0	0
	-5,837	0	-7,202

	Realization 2022 K€	Budget 2022 K€	Realization 2021 K€
12. Other government funding and subsidies			
Other government funding and subsidies	155	0	1,026
Other government funding and subsidies			
Allocations	155	0	1,273
From (+) / to (-) balance sheet	0	0	-247
	155	0	1,026
Other government funding and subsidies			
Foundation SOFOKLES (VSNU)	-79	0	-80
Subsidy corona jobs	0	0	420
Subsidy before the class	0	0	933
Open and online higher education - eWaterCycle	134	0	0
Open and online higher education - HANDZONEe	100	0	0
	155	0	1,273
From (+) / To (-) balance sheet			
Subsidy corona jobs	0	0	-247
	0	0	-247
13. Tuition and examination fees			
Tuition fees for university education sector	71,350	73,217	74,252
14. Income from work commissioned by third parties			
Contractual research			
National governments	62,571	42,060	40,172
International governments	31,957	19,378	18,508
Other non-profit organisations	36,420	21,031	20,087
Companies	44,038	72,063	68,828
NWO	51,984	59,684	57,005
KNAW	563	1,566	1,496
Total	227,533	215,782	206,096
15. Other income			
Rental property	6,137	5,892	6,198
Sales to third parties*	2,002	911	1,389
Specific contributions from third parties	5,395	484	4,121
External contribution to Kavli Foundation	153	0	176
Financial management foundation of the 4TU.Federation	96	0	275
Other	25,167	17,751	16,742
	38,950	25,038	28,901
*: Relates to the balance from sales of materials and consists of:			
Turnover	2,619	911	1,705
Cost price of turnover	-617	0	-316
	2,002	911	1,389

16, Personnel expenses

	Realization 2022 K€	Budget 2022 K€	Realization 2021 K€
Wages and salaries	418,258	420,274	387,350
Social security costs	110,567	118,036	103,573
Other personnel expenses	102,322	80,768	64,041
Staff provisions	2,028	2,843	9,181
	633,175	621,921	564,145
Wages and salaries			
Salaries	374,342	376,474	349,826
Overtime allowances	250	300	147
Bonuses	2,667	2,500	2,153
Holiday allowances	25,877	26,000	24,225
Other allowances	15,122	15,000	10,999
	418,258	420,274	387,350
Social security costs			
Contribution pursuant to Healthcare Insurance Act	21,378	22,000	20,520
Pension contribution	60,585	62,000	56,969
Contribution pursuant to social security laws	28,604	34,036	26,084
	110,567	118,036	103,573
Other personnel expenses			
Third-party personnel	70,622	61,340	55,194
Change to holiday entitlements reserve	11,943	0	-2,507
Education and training	7,713	2,109	5,932
Conferences and symposia	2,626	41	805
Other	9,418	17,278	4,617
	102,322	80,768	64,041
Staff provisions			
Allocation to/release from provision redundancy pay	1,028	2,843	3,746
Allocation to/release from provision sabbatical leave	75	0	176
Allocation to/release from provision recalibration	35	0	-161
Allocation to/release from provisions reorganisation	-53	0	-1,435
Allocation to/release from provisions anniversary benefits	294	0	2,103
Allocation to/release from transition provision	756	0	3,093
Allocation to/release from provision own risk insurance ZW-flex	295	0	400
Allocation to/release from provision own risk insurance WGA	-402	0	1,259
	2,028	2,843	9,181

Staffing overview

Staffing of the organisational units in FTEs at the end of the financial year was as follows:

Organisational units	Academic staff		Support staff		Totaal	
	2022	2021	2022	2021	2022	2021
Faculty of Architecture and the Built Environment	375.6	345.2	85.2	75.4	460.8	420.6
Faculty of Civil Engineering and Geosciences	618.5	591.2	127.8	129.7	746.3	720.9
Faculty of Electrical Engineering, Mathematics and Computer Science	791.3	736.4	150.5	146.6	941.8	883.0
Faculty of 3mE	618.7	568.0	126.3	116.6	745.0	684.6
Faculty of Industrial Design Engineering	230.5	221.7	56.3	56.7	286.8	278.4
Faculty of Applied Sciences	623.0	625.7	263.2	267.8	886.1	893.5
Faculty of Aerospace Engineering	361.4	343.1	81.0	73.2	442.4	416.3
Faculty of Technology, Policy and Management	327.8	298.1	53.1	57.7	380.9	355.8
QuTech	136.6	137.2	51.6	41.6	188.2	178.8
University Services	8.2	0.0	1,541.0	1,484.2	1,549.2	1,484.2
	4,091.5	3,866.7	2,536.0	2,449.5	6,627.5	6,316.2

Staff resources divided into functions per FTE at the end of the financial year:

	BK	CiTG	EWI	3mE	IO	TNW	LR	TBM	QuT	UD	Total
Academic staff											
Professor	31.5	49.7	50.0	35.7	24.9	48.0	19.6	24.8	0.0	2.0	286.2
Associate Professor	42.6	61.6	58.5	40.3	17.2	47.6	35.2	38.2	1.0	0.0	342.2
Assistant Professor	77.6	84.2	131.7	93.1	43.8	57.5	67.7	70.8	0.0	0.0	626.4
Doctoral candidates	69.1	245.7	410.0	313.0	67.7	284.8	171.3	106.4	99.0	0.0	1,766.9
Trainee research assistants	0.0	5.0	0.0	0.0	0.0	38.0	0.0	0.0	0.0	0.0	43.0
Other academic staff	154.9	172.4	141.0	136.7	76.9	147.2	67.6	87.6	36.6	6.2	1,026.9
	375.6	618.5	791.3	618.7	230.5	623.0	361.4	327.8	136.6	8.2	4,091.5
Administrative and support staff											
Rank category scale 16 and higher	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	11.8	12.8
Rank category scale 11 to 15	16.3	21.7	42.2	39.3	18.1	50.5	25.2	11.6	25.5	664.6	915.0
Rank category scale 1 to 10	51.9	91.0	108.3	87.0	37.6	212.1	52.4	41.5	25.1	859.5	1,566.4
Student teaching assistants	17.0	14.6	0.0	0.0	0.6	0.6	3.4	0.0	0.0	0.0	36.2
Other	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.1	5.6
	85.2	127.8	150.5	126.3	56.3	263.2	81.0	53.1	51.6	1,541.0	2,536.0
Total	460.8	746.3	941.8	745.0	286.8	886.1	442.4	380.9	188.2	1,549.2	6,627.5

Staffing in the consolidated participations of TU Delft Services B.V. was 58,16 FTEs at the end of the financial year (2021: 55,24 FTEs). The other consolidated participations do not employ staff.

There were no employees working outside the Netherlands in 2022 (2021: 0.0 FTEs)

	Realization 2022 K€	Budget 2022 K€	Realization 2021 K€
17. Depreciation			
Depreciation	<u>44,443</u>	<u>48,795</u>	<u>42,744</u>
Depreciation			
Depreciation costs land and roads	1,220	986	1,190
Depreciation costs buildings	24,782	26,441	23,408
Depreciation costs equipment and inventory	<u>18,441</u>	<u>21,368</u>	<u>18,146</u>
	<u>44,443</u>	<u>48,795</u>	<u>42,744</u>
18. Accommodation expenses			
Rent	2,387	1,486	773
Legislative charges	1,892	2,447	2,360
Maintenance and operation	36,277	31,463	27,223
Energy	16,261	9,938	12,892
Allocation to/release from RID dismantling provision	3,390	3,300	3,345
Allocation to/release from sewer system provision	-224	500	1,544
Allocation to/release from asbestos provision	1,347	500	6,833
Other accommodation expenses	<u>22,170</u>	<u>29,123</u>	<u>21,376</u>
	<u>83,500</u>	<u>78,757</u>	<u>76,346</u>
19. Other expenses			
Equipment and inventory	46,569	49,869	44,972
Miscellaneous expenses	<u>52,149</u>	<u>69,729</u>	<u>62,803</u>
	<u>98,718</u>	<u>119,598</u>	<u>107,775</u>
Equipment and inventory			
Maintenance	20,693	19,340	18,960
Rental	2,381	3,796	3,153
Other equipment	<u>23,495</u>	<u>26,733</u>	<u>22,859</u>
	<u>46,569</u>	<u>49,869</u>	<u>44,972</u>
Miscellaneous expenses			
Material-related expenses	28,060	32,753	24,755
VAT Reimbursement for indirect costs	-8,846	0	-5,259
Administrative overheads	5,734	4,518	4,725
Travel and accommodation expenses	7,748	6,771	1,328
Funds and contributions	22,289	17,133	22,181
Costs of subcontracted work	5,030	6,936	5,165
Impairment loan HollandPTC B.V.*	-5,000	0	2,500
Allocation to/release from student provision	2,084	0	2,151
Allocation to/release from fissionable materials provision	1,918	0	-443
Allocation to/release from provision for doubtful debt	575	0	0
Allocation to/release from tram line provision	0	75	950
Other**	<u>-7,443</u>	<u>1,543</u>	<u>4,750</u>
	<u>52,149</u>	<u>69,729</u>	<u>62,803</u>

* During 2022 the M€ 5 loan to HollandPTC is converted into share equity. This capital injection resulted in the release of the negative provision, which is shown on the balance sheet in result from participations.

** The mutation relates to the release of a last year formed personnel liability of M€ 7,4 and an amount of K€ 214 (2021: K€ 586 relating to exchange rate differences).

	Realization 2022 K€	Budget 2022 K€	Realization 2021 K€
20. Financial income and expenses			
Dividends	729	108	350
Interest income	30	300	1,872
Value adjustments to financial fixed assets	-1,837	-50	-700
Interest expenses	-351	-378	0
	-1,429	-20	1,522
Dividends			
Dividends	729	108	350
Interest income			
Interest income	30	300	1,872

	Realization 2022	Realization 2021
Value adjustments to financial fixed assets		
Bioprocess Pilot Facility B.V.	0	-45
Chrysalix RoboValley US Limited Partners	-26	-21
City Analytics B.V.	-25	0
Clear Flight Solutions B.V.	0	-125
Dutch Greentech Fund B.V.	-2	-12
E-Stone Batteries B.V.	0	-250
EXO Ligament B.V.	-25	0
Flapper Drones B.V.	0	-40
FORWARD.one Fund II Coöperatief U.A.	-7	0
GeoThermie Delft	-1,141	0
Gilbert Technologies B.V.	256	0
Graduate Entrepreneur Fund Cooperatief U.A.	-9	0
Innovation Industries Fund II Cooperatief U.A.	-4	-29
Mainport Innovation Fund II B.V.	1	-9
PV Works B.V.	-1	0
QdepQ Systems B.V. (liquidated)	-250	-18
Sandgrain B.V.	0	-141
Shift Invest III Cooperatief U.A.	-17	-4
Shift Invest Cooperatief U.A.	-5	-6
STAND IP B.V.	-20	0
Teller B.V.	-162	0
Thuja Capital Healthcare Fund III Coöperatief UA	-10	0
TUDesc B.V.	-1	0
UNIIQ B.V.	9	0
Urban Mining Corp B.V.	-398	0
	-1,837	-700

	Realization 2022 K€	Budget 2022 K€	Realization 2021 K€
Interest expenses			
Interest expenses	351	378	0

21. Taxes

Corporate income tax consolidated participations	-10	108	62
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The following consolidated participations are liable for corporate income tax: Delft Projectmanagement B.V., FlexDelft B.V., FlexDelft Detacheringen B.V., Foundation Enterprises Accounting, Foundation SAM|XL, Foundation RoboValley, Suenso Molengraaffsingel B.V., Technostarters Delft Vastgoed B.V., TU Delft Services B.V. and YES!Delft B.V. TU Delft is not liable for corporate income tax.

22. Result from participations

Result participations	-4,195	0	0
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Result participations

HollandPTC B.V.*	-4,195	0	0
Mainport Innovation Fund B.V.	0	0	0
TUD Beijing Institute WFOE	0	0	0
VINwater	0	0	0
	-4,195	0	0

* During 2022 the M€ 5 loan to HollandPTC is converted into share equity. This capital injection resulted in the release of the negative provision, which is shown on the balance sheet in result form participations.

23. Minority interest

Minority interest	-19	-13	-27
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10. COMPANY FINANCIAL STATEMENTS

10.1 Company balance sheet as at 31 December 2022

Amounts in thousands of euros (after appropriation of result)

		31-12-2022 K€	31-12-2021 K€
Assets			
Fixed assets			
Tangible fixed assets	24	585,523	555,690
Financial fixed assets	25	61,555	55,873
Total fixed assets		647,078	611,563
Current assets			
Inventories	26	2,081	2,416
Accounts receivables and other receivables	27	116,612	110,717
Current securities		0	0
Cash and cash equivalents	28	327,442	258,878
Total current assets		446,135	372,011
Total assets		1,093,213	983,574
Equity and liabilities			
Equity Delft University of Technology	29	528,937	479,112
Provisions	30	95,278	101,667
Long-term liabilities	31	11,019	11,126
Current liabilities	32	457,979	391,669
Total equity and liabilities		1,093,213	983,574

10.2 Company statement of income and expenses for the year 2022

Amounts in thousands of euros

		Realization 2022 K€	Budget 2022 K€	Realization 2021 K€
Income	33			
Government funding	34	575,738	543,289	514,450
Other government funding and subsidies	35	155	0	1,026
Tuition and examination fees	36	71,350	73,217	74,252
Income from work commissioned by third parties	37	229,193	217,075	207,590
Other income	38	17,301	12,903	15,088
Totaal income		893,737	846,484	812,406
Expenses				
Personnel expenses	39	627,682	616,271	559,654
Depreciation	40	42,052	46,484	40,570
Accommodation expenses	41	82,199	77,802	75,519
Other expenses	42	99,390	117,795	108,114
Total expenses		851,323	858,352	783,857
Operating result		42,414	-11,868	28,549
Financial income and expenses	43	1,691	-500	434
Result		44,105	-12,368	28,983
Result from participations	44	5,880	0	5,092
Net result		49,985	-12,368	34,075

10.3 Notes to the company balance sheet

Assets

Fixed assets

24. Tangible fixed assets

	31-12-2022 K€					31-12-2021 K€
Land and roads	70,924					62,171
Completed buildings and installations	373,548					313,771
Building and installations under construction	40,632					94,789
Equipment and inventory	65,007					55,283
Advance payments	35,412					29,676
	585,523					555,690

	Land and roads	Completed buildings and installations	Completed buildings under construction	Equipment and inventory	Advance payments	Total
Balance as at 1 January 2022						
Cumulative purchase cost	70,847	825,796	94,789	248,298	29,676	1,269,406
Accumulated depreciation	-8,676	-512,025	0	-193,015	0	-713,716
Book value as at 1 January 2022	62,171	313,771	94,789	55,283	29,676	555,690
Mutations						
Investments	0	25,867	12,918	7,220	29,593	75,598
Transfer to land and roads	9,967	0	-9,967	0	0	0
Transfer to completed buildings	182	59,410	-55,073	0	-4,519	0
Transfer to equipment and inventory	0	0	-1,298	20,636	-19,338	0
Depreciation	-1,220	-22,700	0	-18,132	0	-42,052
Disposals	0	-4,000	0	-4,677	0	-8,677
Depreciation on disposals	0	0	0	4,677	0	4,677
Other changes	-176	1,200	-737	0	0	287
Balance movements	8,753	59,777	-54,157	9,724	5,736	29,833
Balance as at 31 December 2022						
Cumulative purchase cost	80,810	907,073	40,632	271,620	35,412	1,335,547
Accumulated depreciation	-9,886	-533,525	0	-206,613	0	-750,024
Book value as at 31 December 2022	70,924	373,548	40,632	65,007	35,412	585,523

Land, Roads and buildings

- Campus Zuid

The amount for land and roads included a value of M€ 20 with regard to the Campus Zuid area. The current value of buildings and land has not been determined.

- Sale object Mijnbouwkunde

In 2022 the sale and transfer of object Mijnbouwstraat, with a initial book value of €4 million, was completed. This resulted in a sales result of €1 million for this year.

- Land development

The University develops land for the allocation of plots of leasehold land. These costs are capitalised and depreciated over the term of the lease after the plots have been allocated. The leases acquired are included under long-term liabilities and, also during the term of a long-term lease, are released to the income statement. This is included separately under the item other changes.

- Collateralization

Related to the financial security for the dismantling of the Reactor Institute Delft (RID), there is a mortgage right on the buildings Landbergstraat 15 and Mekelweg 2 at Delft.

Equipment and inventory

- Books / media collection

Purchases with the purpose of maintaining the collection of the university library is charged to the operating account in the year of purchase. In 2022 this concerned an amount of M€ 7,9 (2021: M€ 8,0).

Advance payments

Some of the other movements have a connection from the past due to a research asset that was initially valued as a research project but actually concerns a tangible fixed asset. This correction is not significant, therefore the figures of the previous years have not been adjusted.

25. Financial fixed assets

	31-12-2022 K€	31-12-2021 K€
Participations	42.218	36.498
Loans	19.337	19.375
	61.555	55.873

	31-12-2021 K€	Additions K€	Disposals K€	Result K€	31-12-2022
Participating interests					
TU Delft Services B.V.*	29,769	0	-160	-3,127	26,482
Delft Enterprises B.V.*	6,729	0	0	9,007	15,736
Total	36,498	0	-160	5,880	42,218

* This 100% participation is valued at net asset value.

** As of June 1, 2022, foundation Enterprises Accounting was disbanded and activities have been transferred to TU Delft Services B.V.

	31-12-2021 K€	Additions K€	Disposals K€	Result K€	31-12-2022
Leningen					
Study and student associations	25	0	-5	0	20
Foundation Laboratoriumvliegtuig NLR/ TU Delft	34	0	-34	0	0
Student Emergency Fund	16	1	0	0	17
TU Delft Services B.V.	19,300	0	0	0	19,300
Total	19,375	1	-39	0	19,337

Study and student associations

Concerns three long-term interest-free loans. Nothing has been agreed with regard to collateral.

Foundation Laboratoriumvliegtuig NLR/ TU Delft

In 2011, an interest-free loan was granted to Foundation Laboratoriumvliegtuig NLR/TU Delft. The foundation requires this loan in order to reinvest in an aircraft cockpit for research purposes at TU Delft. The principal of the loan is K€ 341 and will be fully repaid in 2022. Nothing has been agreed with regard to collateral.

Student Emergency Fund

An emergency fund exists for students with financial problems. The emergency fund is only used in exceptional cases, always involves a loan and in all cases involves costs other than tuition fees, such as hospital costs. Tuition fees are not reimbursed.

TU Delft Services B.V.

Four loans have been granted to TU Delft Services B.V. for the purpose of financing the development of real estate. This concerns loans with principals of M€ 6,6, M€ 2,5, M€ 6,5 and M€ 5,0. Repayment is variable and no end date has been agreed.

Current assets

31-12-2022
K€

31-12-2021
K€

26. Inventories

Consumer goods

2,081

2,416

During the year more inventory is used than purchased, this caused a decrease in the inventory position.

27. Accounts receivables and other receivables

Accounts receivables

20,663

15,501

Receivables relating to government funding

0

900

Prepaid expenses of multi-year projects and grants

72,100

74,008

Other receivables, prepayments and accrued income

23,849

20,308

116,612

110,717

Accounts receivables

Receivables on accounts receivable

23,358

15,682

Receivables on related parties

1,593

2,603

24,951

18,285

Provision for doubtful debts

-4,288

-2,784

20,663

15,501

Accounts receivable include receivables aged over one year up to an amount of K€ 2,907 (2021: K€ 3,901).

Receivables relating to government funding

BaMa compensation

0

900

The claim on the Ministry of Education, Culture and Science concerns compensation for missing out on funding as a result of the introduction of the bachelor-master structure in the period 2003-2008.

In 2022, a repayment of K€ 900 was received (2021: K€ 2,402), and everything was compensated.

Prepaid expenses of multi-year projects and grants

Prepaid expenses of projects and grants with a debit balance

466,209

395,764

Progress payments

-358,674

-290,730

contingency own contribution

-35,435

-31,026

72,100

74,008

The term of the receivable depends on the degree of advance funding by these external funders. These receivables have a term of more than one year.

	31-12-2022 K€	31-12-2021 K€
Other receivables, prepayments and accrued income		
Tuition and examination fees	58	97
Advances to staff	388	88
Prepaid amounts	17,463	15,001
Interest receivable	1,058	0
Amounts to be charged	3,932	5,072
Funds to be received for Professional Learning Communities	950	50
	23,849	20,308

28. Cash and cash equivalents

Cash in hand	17	42
Cash at bank	6,041	12,464
Current account treasury banking	321,384	246,372
	327,442	258,878

All cash and current account balances are at free disposal by TU Delft and its consolidated entities.

The interest paid on these accounts is variable and linked to the development of the Euribor-rate and the interest rate policy of commercial banks.

The interest rate on the current account treasury banking is based on EONIA fixing. In case of negative interest rates, this interest rate is equalled to zero.

Equity and liabilities

	31-12-2022 K€	31-12-2021 K€
29. Equity Delft University of Technology		
Balance as at 1 January	479,112	445,172
Result for the year	49,985	34,075
Other changes	-160	-135
Balance as at 31 December	528,937	479,112

	Balance as at 01-01-2022 K€	Proposed result K€	Other changes K€	Balance as at 31-12-2022 K€
General reserve				
General reserve	478,344	50,427	-160	528,611
	478,344	50,427	-160	528,611
Statutory (public)				
LDE Alliance (public)	768	-442	0	326
	768	-442	0	326
	479,112	49,985	-160	528,937
General reserve				
General reserve	443,688	34,791	-135	478,344
	443,688	34,791	-135	478,344
Statutory (public)				
LDE Alliance (public)	1,484	-716	0	768
	1,484	-716	0	768
	445,172	34,075	-135	479,112

General reserve

This relates to equity without specific spending restrictions and is therefore freely disposable.

As of June 1, 2022, foundation Enterprises Accounting was disbanded and activities have been transferred to TU Delft Services B.V.

In 2021 the other changes include the parking revenues regarding Campus-Zuid which were not recorded in accordance with laws and regulations at an earlier stage. It's not a material misstatement therefore error recovery is not applicable.

Statutory reserve (public)

This concerns the reserves formed based on an Executive Board decision intended for specific expenditures on education and research at the faculties and services.

public

Resources made available in context of the partnership between Leiden University, TU Delft and Erasmus University Rotterdam (LDE).

30. Provisions

	31-12-2022	31-12-2021
	K€	K€
Staff provisions	30,179	34,258
Student provisions	2,117	1,912
Miscellaneous provisions	62,982	65,497
	95,278	101,667

Staff provisions	31-12-2021	Release	Dotation	Utilisation	31-12-2022
	K€	K€	K€	K€	K€
Redundancy pay	10,673	-3,026	4,054	-3,129	8,572
Sabbatical leave	1,822	-335	410	0	1,897
Recalibration	296	0	35	-96	235
Reorganisation	375	-53	0	-92	230
Anniversary benefits	10,231	-1,322	1,616	-776	9,749
Transitional provision	6,644	-528	1,284	-1,281	6,119
Own risk insurance ZW-flex	468	-491	786	-392	371
Own risk insurance WGA	3,749	-1,376	974	-341	3,006
Total	34,258	-7,131	9,159	-6,107	30,179

Redundancy pay

This concerns the provision for future payments to (former) employees who claim or are eligible to claim benefits under the redundancy pay scheme.

Sabbatical leave

This concerns the provision for the liabilities related to sabbatical leave.

Recalibration

This provision was created to fund the organisational changes resulting from the review process. Provisions are valued at net present value, taking into account a wage indexation of 4% per year and a discount rate of 2%.

Reorganisation

This provision relates to the liabilities arising from the reorganisation in respect of the organisational units. Provisions are valued at net present value, taking into account a wage indexation of 4% per year and a discount rate of 2%.

Anniversary benefits

Concerns the provision for the liabilities related to anniversary bonuses. Provisions are valued at net present value, taking into account a wage indexation of 4% per year and a discount rate of 2%.

The valuation method of the provision for anniversary benefits has been refined in 2022. This accounting estimate relates to the allocation method regarding the 40 year anniversary. Based on the likelihood of employment duration, a provision is formed, from the first year instead of 25 years.

Transitional provision

This concerns the provision for future transition payments to employees on termination of temporary employment of 2 years or more.

Own risk insurance ZW-flex

These concern provisions for future benefit payments to employees and former employees under the Sickness Benefit Act (ZW).

Own risk insurance WGA

These concern provisions for future benefit payments to employees and former employees under the Return to Work (Partially Disabled Persons) Regulation (WGA). Provisions are valued at net present value, taking into account a wage indexation of 4% per year and a discount rate of 2%.

Student provisions	31-12-2021	Release	Dotation	Utilisation	31-12-2022
	K€	K€	K€	K€	K€
Student Financial Support Fund	1,912	0	2,084	-1,879	2,117
Total	1,912	0	2,084	-1,879	2,117

Concerns the provision for the liabilities related to the financial support of students, whom incurred a study delay due to special circumstances.

Miscellaneous provisions	31-12-2021	Release	Dotation	Utilisation	31-12-2022
	K€	K€	K€	K€	K€
Fissionable materials	3,200	0	575	-109	3,666
Asbestos	19,869	0	1,346	-1,498	19,717
Sewer system	2,679	-287	63	-995	1,460
RID Dismantling	29,324	0	3,390	0	32,714
Guarantee HollandPTC B.V.	5,000	-5,000	0	0	0
Other	5,425	0	0	0	5,425
Total	65,497	-5,287	5,374	-2,602	62,982

Fissionable materials

This provision is made up of the costs arising from the disposal and storage of fissionable materials. The amount is determined according to the nature of the individual activities of disposal and storage and is calculated by an internal specialist on the basis of external contracts (COVRA).

Asbestos

In the provision for asbestos removal, the amount is based on an inventory of the whole TU Delft campus, with costs calculated per building on the basis of empirical data for each type of asbestos. The actual expenditures relating to asbestos depend on the coordination of asbestos removal with demolition and renovation programmes. The provision is carried at net present value, with a discount rate of 2%.

Sewer system

TU Delft has included a provision to replace the sewer systems in the coming years because of their poor condition. The provision is carried at net present value, with a discount rate of 2%.

RID Dismantling

Based on the Nuclear Energy Act, TU Delft is a licensee of the Reactor Institute Delft (RID), as referred to in Article 15b of the Nuclear Energy Act. As of April 1, 2011, an amendment to the Nuclear Energy Act in force in which (among other things) an obligation for the license holders of nuclear power plants and reactors is included to provide financial security to propose the costs that are associated with the decommissioning and decommissioning of a nuclear power plant or reactor by the license holder. For financial security, two TU Delft buildings are subject to a mortgage.

A provision for the future dismantling of the RID has been formed in the annual accounts, to which is added annually according to time-proportional use. The RID removal provision is periodically tested. The last time in 2020, no changes of a material nature have arisen from this.

Guarantee HollandPTC B.V.

During 2022 the M€ 5 loan to HollandPTC is converted into share equity. This capital injection resulted in the release of the negative provision, which is shown on the balance sheet in result from participations.

Other

This consists of several provisions created from contractual obligations that TU Delft has committed to in the past and that relate to projects in the context of realizing the campus vision.

Balance breakdown	Balance K€	< 1 year K€	1 - 5 year K€	> 5 year K€
Staffprovisions	30,179	7,545	15,693	6,941
Student provisions	2,117	1,228	889	0
Miscellaneous provisions	62,982	3,651	14,590	44,741
	95,278	12,424	31,172	51,682

31. Long-term liabilities

	31-12-2022	31-12-2021
Long lease ground rent	11,019	11,126

32. Current liabilities

Accounts payable	2,638	1,160
Turnover tax	996	1,985
Payroll tax	24,406	22,922
Pension contributions	6,972	6,592
Advance payments for multi-year projects and grants	193,163	200,761
Accruals and deferred income	229,804	158,249
	457,979	391,669

The current liabilities all have a remaining duration of less than one year. The fair value of current liabilities approximates the book value because of their short-term nature.

Advance payments for multi-year project and grants

Progress payments	572,123	533,150
Prepaid expenses of projects with a credit balance	-378,071	-339,611
Contingency own contribution	-889	7,222
	193,163	200,761

The duration of the amounts received in advance depends on the degree of advance payment by the external financiers and may have a maturity of more than one year.

Accruals and deferred income

Accrued holiday entitlements	33,412	21,469
Amounts payable	55,844	56,611
Tuition and examination fees received in advance (1 January - 31 August)	48,550	31,669
Holiday allowances payable (1 June - 31 December)	14,906	14,133
Gravitation programme earmarked funds	8,339	7,672
Gravitation programme funds still available: Bèta & Techniek 2*	5,653	0
Gravitation programme funds still available: Starters- en stimuleringsbeurzen*	5,738	0
Gravitation programme funds still available: Frontiers of Nanoscience	2,219	8,454
Gravitation programme funds still available: Building a Synthetic Cell	1,433	1,668
Advance payments received for coordination activity	50,853	13,122
Advance payments	2,857	3,451
	229,804	158,249

* The Gravitation programme funds: Bèta & Techniek 2 and Starters- en stimuleringsbeurzen are additional government allocations from The Ministry of Education, Culture and Science classified as 'not normative government funding'. The still available allocations in 2022 are passivated on the balance sheet.

Commitments and contingencies

Reactor Institute Delft

TU Delft is the licence holder of the Reactor Institute Delft (RID), in accordance with Section 15b of the Nuclear Energy Act. On 1 April 2011, an amendment to the Nuclear Energy Act took effect, which (among other things) obliges licence holders of nuclear plants and reactors to provide financial security for the costs related to the shutdown and dismantlement of the nuclear plant or reactor by the licence holder. For the purpose of this financial security, two buildings of the TU Delft have been secured by a mortgage. The final agreement for the financial security is in consultation with the involved Ministries following the approval in 2021 on the reassessed dismantle plan. At the end of 2022, a provision of M€ 32,7 (2021: M€ 29,3) for the future dismantling of the RID is included in the financial statements. Annually an allocation is made, proportional to the period of use.

Investment obligations

At the end of the financial year, TU Delft has outstanding investment obligations equivalent to M€ 17,8 (2021: M€ 20,4).

Guarantee for HollandPTC B.V.

TU Delft is a guarantor for one-third of the actual loans granted to HollandPTC B.V. by the European Investment Bank (EIB). The guarantee relates to 33,33% of the remaining principal amount including interest and other associated costs. Due to a higher market interest compared to the agreed upon interest the costs for early repayment are estimated at zero. At year end 2022 a loan amount of M€ 71,4 has been withdrawn by HollandPTC at the EIB. This corresponds with a guarantee of M€ 25,9 for interest and repayments (2021: M€ 32,0) for TU Delft.

Quantum Technology (QuTech)

TU Delft signed a covenant for strategic partnership with the Minister of Economic Affairs, the Minister of Education, Culture and Science, the Netherlands Organisation for Applied Scientific Research (TNO), the Netherlands Organisation for Scientific Research (NWO) and Foundation TKI HTSM regarding the field of quantum technology (QuTech). The covenant has a duration until 1 July 2025. The resulting financial obligation for TU Delft is an in kind contribution of M€ 3 (2021: M€ 3) per year and a cash contribution of approximately M€ 3 (2021: M€ 3) per year.

VAT on overhead costs

Delft University of Technology is in a conversation with the Dutch Tax and Customs Administration about the claimed tax receivable relating to overhead costs from financial year 2019 and further. TU Delft and the Dutch Tax and Customs Administration have the intention to bring this case to court in order to obtain clarity. The outcome of this procedure cannot be predicted in advance. Furthermore, the Dutch Tax and Customs Administration has partially agreed to accommodate the point of view from TU Delft.

The numerical effect of the concession for the year 2019 and further must be further aligned with the Dutch Tax and Customs Administration and is estimated at this moment at M€ 10.

Lease obligation

At the end of this financial year, TU Delft has no operational lease obligations outstanding (2021: K€ 0).

Related parties

All legal entities over which control, joint control or significant influence can be exercised are considered to be related parties. Legal entities that can exercise control are also considered to be related parties.

The members of the Board under the articles of association, other key officials in the institution's management and close relatives are also related parties.

Significant transactions with related parties are commented on when they have not been concluded at arm's length. In this respect, the nature and size of the transaction are clarified, as well as other information that is needed to provide insight.

For an overview of related parties, reference is made to Model E: Related parties as included in this annual financial statement.

10.4 Notes to the company statement of activities

	Realization 2022 K€	Budget 2022 K€	Realization 2021 K€
33. Income			
Government funding	575,738	543,289	514,450
Other government funding and subsidies	155	0	1,026
Tuition and examination fees	71,350	73,217	74,252
Income from work commissioned by third parties	229,193	217,075	207,590
Other income	17,301	12,903	15,088
	893,737	846,484	812,406

34. Government funding

Government grants	575,738	543,289	514,450
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Government funding

Government funding Ministry of Education, Culture and Science*	512,741	543,289	484,396
Other allocations	68,834	0	37,256
From (+) / To (-) balance sheet	-5,837	0	-7,202
	575,738	543,289	514,450

* As of the financial year 2008, TU Delft has acted as an intermediary for the Government allocations for the IHE Delft Institute for Water Education. In 2022 this amounted to M€ 11,9. This amount is not included in the item Government funding M€ 575,8, as this has been transferred to IHE Delft Institute for Water Education.

Other allocations

Gravity program: Frontiers of Nanoscience	1,433	0	1,543
Gravity program: Building a Synthetic Cell	0	0	2,933
Quality agreements (Wet Studievoorschot)	16,018	0	12,464
Sectorplan Bèta & Techniek	12,582	0	12,188
Sectorplan Bèta & Techniek 2	6,030	0	0
National education program	26,930	0	8,126
Starters- en stimuleringsbeurzen	5,738	0	0
BaMa compensation, price adjustment	103	0	2
	68,834	0	37,256

From (+) / To (-) balance sheet

Gravity program: Frontiers of Nanoscience	6,235	0	-188
Gravity program: Building a Synthetic Cell	235	0	408
National education program	-916	0	-7,422
Starters- en stimuleringsbeurzen	-5,738	0	0
Sectorplan Bèta & Techniek 2	-5,653	0	0
	-5,837	0	-7,202

	Realization 2022 K€	Budget 2022 K€	Realization 2021 K€
35. Other government funding and subsidies			
Other government funding and subsidies	155	0	1,026
Other government funding and subsidies			
Allocations	155	0	1,273
From (+) / to (-) balance sheet	0	0	-247
	155	0	1,026
Other government funding and subsidies			
Foundation SOFOKLES (VSNU)	-79	0	-80
Subsidy corona jobs	0	0	420
Subsidy for extra help for the class	0	0	933
Open and online higher education - eWaterCycle	134	0	0
Open and online higher education - HANDZONEe	100	0	0
	155	0	1,273
From (+) / To (-) balance sheet			
Subsidy corona jobs	0	0	-247
	0	0	-247
36. Tuition and examination fees			
Tuition fees for university education sector	71,350	73,217	74,252
37. Income from work commissioned by third parties			
Contractual research			
National governments	63,164	42,432	40,578
International governments	32,260	19,549	18,695
Other non-profit organisations	36,766	21,218	20,291
Companies	44,456	72,702	69,525
NWO	51,984	59,610	57,005
KNAW	563	1,564	1,496
Total	229,193	217,075	207,590

	Realization 2022 K€	Budget 2022 K€	Realization 2021 K€
38. Other income			
Rental property	3,834	3,662	3,794
Sales to third parties*	2,002	911	1,389
Specific contributions from third parties	467	733	227
Financial management foundation of the 4TU.Federation	96	0	275
Other	10,902	7,597	9,403
	17,301	12,903	15,088

*: Relates to the balance from sales of materials and consist of:

Turnover	2,619	911	1,705
Cost prices of turnover	-617	0	-316
	2,002	911	1,389

39. Personnel expenses

Wages and salaries	403,235	405,820	373,249
Social security costs	105,908	114,018	99,513
Other personnel expenses	116,511	93,590	77,711
Staff provisions	2,028	2,843	9,181
	627,682	616,271	559,654

Wages and salaries

Salaries	359,319	362,020	335,725
Overtime allowances	250	300	147
Bonuses	2,667	2,500	2,153
Holiday allowances	25,877	26,000	24,225
Other allowances	15,122	15,000	10,999
	403,235	405,820	373,249

Social security costs

Contribution pursuant to Healthcare Insurance Act	21,378	22,000	20,520
Pension contribution	60,585	62,000	56,969
Contribution pursuant to social security laws	23,945	30,018	22,024
	105,908	114,018	99,513

Other personnel expenses

Third-party personnel	84,676	74,354	68,999
Change to holiday entitlements reserve	11,943	0	-2,507
Education and training	7,713	2,109	5,932
Conferences and symposia	2,626	41	805
Other	9,553	17,086	4,482
	116,511	93,590	77,711

	Realization 2022 K€	Budget 2022 K€	Realization 2021 K€
Staff provisions			
Allocation to/release from provision redundancy pay	1,028	2,843	3,746
Allocation to/release from provision sabbatical leave	75	0	176
Allocation to/release from provision recalibration	35	0	-161
Allocation to/release from provisions reorganisation	-53	0	-1,435
Allocation to/release from provisions anniversary benefits	294	0	2,103
Allocation to/release from transition provision	756	0	3,093
Allocation to/release from provision own risk insurance ZW-flex	295	0	400
Allocation to/release from provision own risk insurance WGA	-402	0	1,259
	2,028	2,843	9,181

Staffing overview

Staffing of the organisational units in FTEs at the end of the financial year was as follows:

Organisational unit	Academic staff		Support staff		Total	
	2022	2021	2022	2021	2022	2021
Faculty of Architecture and the Built Environment	375,6	345,2	85,2	75,4	460,8	420,6
Faculty of Civil Engineering and Geosciences	618,5	591,2	127,8	129,7	746,3	720,9
Faculty of Electrical Engineering, Mathematics and Computer Science	791,3	736,4	150,5	146,6	941,8	883,0
Faculty of 3mE	618,7	568,0	126,3	116,6	745,0	684,6
Faculty of Industrial Design Engineering	230,5	221,7	56,3	56,7	286,8	278,4
Faculty of Applied Sciences	623,0	625,7	263,2	267,8	886,1	893,5
Faculty of Aerospace Engineering	361,4	343,1	81,0	73,2	442,4	416,3
Faculty of Technology, Policy and Management	327,8	298,1	53,1	57,7	380,9	355,8
QuTech	136,6	137,2	51,6	41,6	188,2	178,8
University Services	8,2	0,0	1.541,0	1.484,2	1.549,2	1.484,2
	4.091,5	3.866,7	2.536,0	2.449,5	6.627,5	6.316,2

Staff resources divided into functions per FTE at the end of the financial year:

	BK	CiTG	EWI	3mE	IO	TNW	LR	TBM	QuT	UD	Total
Academic staff											
Professor	31.5	49.7	50.0	35.7	24.9	48.0	19.6	24.8	0.0	2.0	286.2
Associate Professor	42.6	61.6	58.5	40.3	17.2	47.6	35.2	38.2	1.0	0.0	342.2
Assistant Professor	77.6	84.2	131.7	93.1	43.8	57.5	67.7	70.8	0.0	0.0	626.4
Doctoral candidates	69.1	245.7	410.0	313.0	67.7	284.8	171.3	106.4	99.0	0.0	1,766.9
Trainee research assistants	0.0	5.0	0.0	0.0	0.0	38.0	0.0	0.0	0.0	0.0	43.0
Other academic staff	154.9	172.4	141.0	136.7	76.9	147.2	67.6	87.6	36.6	6.2	1,026.9
	375.6	618.5	791.3	618.7	230.5	623.0	361.4	327.8	136.6	8.2	4,091.5
Administrative and support staff											
Rank category scale 16 and higher	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	11.8	12.8
Rank category scale 11 to 15	16.3	21.7	42.2	39.3	18.1	50.5	25.2	11.6	25.5	664.6	915.0
Rank category scale 1 to 10	51.9	91.0	108.3	87.0	37.6	212.1	52.4	41.5	25.1	859.5	1,566.4
Student teaching assistants	17.0	14.6	0.0	0.0	0.6	0.6	3.4	0.0	0.0	0.0	36.2
Other	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.1	5.6
	85.2	127.8	150.5	126.3	56.3	263.2	81.0	53.1	51.6	1,541.0	2,536.0
Total	460.8	746.3	941.8	745.0	286.8	886.1	442.4	380.9	188.2	1,549.2	6,627.5

There were no employees working outside the Netherlands in 2022 (2021: 0,0 FTEs).

	Realization 2022 K€	Budget 2022 K€	Realization 2021 K€
40. Depreciation			
Depreciation	42,052	46,484	40,570
Depreciation			
Depreciation costs land and roads	1,220	986	1,190
Depreciation costs buildings	22,700	24,414	21,505
Depreciation costs equipment and inventory	18,132	21,084	17,875
	42,052	46,484	40,570
41. Accommodation expenses			
Rent	1,843	960	384
Legislative charges	1,892	2,447	2,360
Maintenance and operation	36,277	31,463	27,223
Energy	16,549	10,175	13,139
Allocation to/release from RID dismantling provision	3,390	3,300	3,345
Allocation to/release from sewer system provision	-224	500	1,544
Allocation to/release from asbestos provision	1,347	500	6,833
Other accommodation expenses	21,125	28,457	20,691
	82,199	77,802	75,519
42. Other expenses			
Equipment and inventory	46,569	48,837	44,972
Miscellaneous expenses	52,821	68,958	63,142
	99,390	117,795	108,114
Equipment and inventory			
Maintenance	20,693	18,931	18,960
Rental	2,381	3,620	3,153
Other equipment	23,495	26,286	22,859
	46,569	48,837	44,972
Miscellaneous expenses			
Material-related expenses	28,060	32,525	24,755
VAT Reimbursement for indirect costs	-8,846	0	-5,259
Administrative overheads	5,367	4,355	4,375
Travel and accommodation expenses	7,682	6,673	1,277
Funds and contributions	25,117	18,824	24,707
Costs of subcontracted work	5,030	6,520	5,155
Allocation to/release from student provision	2,084	0	2,151
Allocation to/release from provision for doubtful debt	1,751	0	-446
Allocation to/release from fissionable materials provision	575	0	0
Impairment loan HollandPTC B.V.*	-5,000	0	2,500
Allocation to/release from tram line provision	0	60	950
Other**	-8,999	1	2,977
	52,821	68,958	63,142

* During 2022 the M€ 5 loan to HollandPTC is converted into share equity. This capital injection resulted in the release of the negative provision.

** The mutation relates to the release of a last year formed personnel liability of M€ 7,4 and an amount of K€ 214 (2021: K€ 586 relating to exchange rate differences).

	Realization 2022 K€	Budget 2022 K€	Realization 2021 K€
43. Financial income and expenses			
Interest income	1,714	100	576
Interest expenses	-23	-600	-142
	1,691	-500	434
44. Result from participations			
Result participations	5,880	0	5,092

External auditor's fees

Specification of fees paid to the house auditor (amounts including turnover tax):

	2022	2021
Audit of the financial statements	298	494
Other audit assignments	537	430
Advisory services on tax matters	0	0
Other non-audit services	11	56
	846	980

For the determination of the auditor's fees, the method used is that the costs are recorded in the year in which the invoices were paid.

MODEL E: Related parties

Amounts in thousands of euro s

Name	Place of business	Activity code	Year	Equity capital	Result	Turnover	Participating %	Art 2:403
Consolidated affiliated parties:								
TU Delft Services B.V. *	Delft	4	2022	26,482	-3,127	16,080	100%	No
Delft Enterprises B.V. **	Delft	4	2022	15,736	9,007	9,997	100%	No
Stichting Het Lammingafonds	Delft	4	2022	2,583	-548	0	100%	No
Stichting Nanoscience TU Delft	Delft	2	2022	11,230	-1,201	0	100%	No
Non-consolidated affiliated parties:								
Foundation Bedrijvenspiegel	Delft	4	2016	75	-14	N/A	N/A	No
Foundation Biotechnology Academy Delft	Delft	1	2020	994	10	N/A	N/A	No
Foundation Far and Large Offshore Wind	Amsterdam	2	***			N/A	N/A	No
Foundation financieel beheer 4TU.Federatie	Delft	4	2020	0	0	N/A	N/A	No
Foundation FMLC	Delft	4	2020	185	-1	N/A	N/A	No
Foundation Universiteitsfonds Delft	Delft	4	2020	5,785	710	N/A	N/A	No
Foundation Laboratoriumvliegtuig NLR/TU Delft	Haarlemmermeer	2	2021	1	0	N/A	N/A	No
Foundation Molengraaff-Funds	Delft	4	2021	1,147	141	N/A	N/A	No
Foundation AMS	Amsterdam	1	***			N/A	N/A	No
Foundation Cyber Security Academy	Den Haag	1	2016	33	33	N/A	N/A	No
Foundation BlueBox Events	Delft	4	2021	-3	2	N/A	N/A	No
Foundation DCM C	Woensdrecht	2	2016	0	0	N/A	N/A	No
Foundation Kenniscentrum Windturbine, Materialen en Constructies (WM C)	Wieringerwerf	2	***			N/A	N/A	No
*: Consolidated affiliated parties of TU Delft Services B.V.:								
Delft Project Management B.V.	Delft	4	2022	673	95	1,776	100%	No
FlexDelft B.V.	Delft	4	2022	3,393	1,153	1,734	100%	No
FlexDelft Detacheringen B.V.	Delft	4	2022	758	115	135	100%	No
Foundation Bijlboegfonds	Delft	4	2022	0	0	46	100%	No
Foundation Green Village	Delft	3	2022	501	477	1,852	100%	No
Foundation Materials innovation institute (M2i)	Delft	4	2022	2,628	-292	777	100%	No
Foundation RoboValley	Delft	4	2022	-49	-21	1,967	100%	No
Foundation SAM XL (Smart Advanced Manufacturing XL)	Delft	4	2022	-845	-29	1,480	100%	No
Foundation Techno Impuls	Delft	4	2022	8,785	311	693	100%	No
Foundation Urban Mobility Observatory	Delft	4	2022	-1	0	0	100%	No
Suenso Molengraafsingel B.V.	Rotterdam	4	2022	641	-7	1,259	100%	No
Technostarters Vastgoed B.V.	Delft	3	2022	8,134	-202	2,783	100%	No
YES!Delft B.V.	Delft	4	2022	698	48	3,281	60%	No
Foundation TU Delft Innovation Campus	Delft	4	2022	0	0	-	100%	No
*: Non-Consolidated affiliated parties of TU Delft Services B.V.:								
Blue Sparrows MedTech Fonds	Leiderdorp	4	2021	586	-869	0	4,44%	No
Chrysalix Robo Valley US Limited Partnership	Vancouver	4	2021	23,844	6,482	3	3,60%	No
Dutch Greentech Fund B.V.	Amsterdam	4	2021	17,730	-285	-113	4,76%	No
FORWARD.one Fund II Coöperatief U.A .	Amsterdam	4	**				0,30%	No
Holland Particle Therapy Centre B.V.	Delft	4	2021	-19,331	-7,194	14,505	33,30%	No
Geo Thermie Delft B.V.	Delft	4	2021	396,180	-250	0	9,90%	No
Graduate Entrepreneur Fund Coöperatief U.A .	Amsterdam	4	**				6,13%	No
ICOS Cleantech Early Stage Fund II B.V. (ICF II)	Badhoevedorp	4	2020	2,428	46	-99	3,85%	No

Name	Place of business	Activity code	Year	Equity capital	Result	Turnover	Participating %	Art 2:403
Innovation Industries Fund II Cooperatief U.A.	Amsterdam	4	2021	90	7	10	13,72%	No
Mainport Innovation Fund B.V.	Amsterdam	4	2021	11,012	-1,565	-1,443	25,00%	No
Mainport Innovation Fund II B.V.	Amsterdam	4	2021	10,268	12,944	13,277	2,02%	No
ROM Innovation Quarter B.V.	Den Haag	4	2021	46,058	-3,623	12,674	0,82%	No
Shift Invest Cooperatief UA	Amstelveen	4	2020	10,972	-474	17	1,50%	No
Shift Invest III Cooperatief U.A.	Amsterdam	4	**				0,47%	No
Teggwings IA B.V.	Delft	4	**				25,00%	No
Thuja Capital Healthcare Fund III Coöperatief UA	Utrecht	4	**				0,33%	No
TUD Beijing Institute WFOE	Beijing	4	**				100,00%	No
UNIIQ B.V.	Den Haag	4	2019	1,768	-228	1,490	16,67%	No
Vinwater	Hanoi	4	2020	60	5	20	49,00%	No
**: Non-consolidated affiliated parties of Delft Enterprises B.V.:								
Adjuvo Motion B.V.	Delft	4	2018	-70	-185	18	7,44%	No
ADR Technology B.V.	Rotterdam	4	2021	-401	-31	84	100,00%	No
Allotropica B.V.	Chapel Hill	4	**				6,59%	No
APTA Technologies B.V.	Den Haag	4	**				15,00%	No
Battolyser B.V.	Schiedam	4	2019	-129	-129	604	10,38%	No
BIOND Solutions B.V.	Den Haag	4	2020	-239	-113	0	15,63%	No
BlueGen.ai Solutions B.V.	Utrecht	4	**				15,00%	No
C2CA Technology B.V.	Utrecht	4	2022	1,496	-12	0	32,84%	No
Carbon X B.V.	Amsterdam	4	2021	-2,716	-1,021	243	5,04%	No
CFS GreenX Holding B.V.	Enschede	4	2020	-3,351	-525	147	5,21%	No
City Analytics B.V.	Delft	4	**				17,50%	No
CloudCuddle B.V.	Delft	4	2022	-47	70	379	29,33%	No
CognitiveIC B.V.	Delft	4	**				20,00%	No
Councyl B.V.	Delft	4	**				45,00%	No
CyberHydra Holding B.V.	Delft	4	**				20,00%	No
DE-Birds B.V.	Delft	4	2021	0	0	0	50,00%	No
Delft Advanced Biofuels B.V.	Delft	4	2019	298	-678	12	31,90%	No
Delft IM P B.V.	Delft	4	2018	-426	-330	215	29,51%	No
Delmic B.V.	Delft	4	2021	-1,239	345	4,393	10,50%	No
DENS solutions B.V.	Delft	4	2018	680	184	4,932	27%	No
EFC Holding B.V.(Cool Separations)	Rotterdam	4	2020	-1,144	-490	251	45%	No
Enevate B.V.	Delft	4	**				15%	No
Exculture B.V.	Leiden	4	**				20%	No
EXO-L B.V.	Delft	4	2020	-582	-123	123	29%	No
Fastree 3D B.V.	Amsterdam	4	**				15%	No
Field Factors B.V.	Delft	4	2020	121	36	396	20%	No
Fizyr B.V.	Delft	4	2021	595	-546	367	8%	No
GBM Works B.V.	Den Haag	4	2019	-152	-152	0	14%	No
Gilbert Technologies B.V.	Naarden	4	2017	7,369	-1,293	0	13%	No
Green Basilisk B.V.	Delft	4	2020	502	-283	144	34%	No
Hardt Gro up B.V.	Delft	4	**				0%	No
HOM IE B.V.	Den Haag	4	2020	-672	-612	201	5%	No
IM Systems Holding B.V.	Delft	4	2022	1,719	-1,089	37	0%	No
Innatera Nanosystems B.V.	Delft	4	2021	3,274	-1,815	120	6%	No
Interactive Robotics B.V.	Delft	4	2019	-15	-60	55	19%	No
Magneto B.V.	Leiden	4	2019	3	3	27	19%	No

Name	Place of business	Activity code	Year	Equity capital	Result	Turnover	Participating %	Art 2:403
Metropolder Company B.V.	Rotterdam	4	2020	43	9	175	25%	No
MEZT B.V.	Den Haag	4	2022	-3	-13	97	25%	No
Mobile Canal Control B.V.	Brouwershaven	4	2013	62	44	96	4%	No
Nature's Principles B.V.	Den Haag	4	**				20%	No
OfficeVitae B.V.	Delft	4	2020	-216	-73	27	33%	No
Ore Energy B.V.	Delft	4	**				15%	No
ParaPy Holding B.V.	Delft	4	2018	127	154	504	10%	No
PATS B.V. (M U-G Knowledge Management)	Delft	4	2020	-363	-242	3	16%	No
Pholtaire B.V.	Rotterdam	4	**				24%	No
Physe B.V.	Amsterdam	4	2018	3	1	169	11%	No
Populytics B.V.	Delft	4	2021	148	128	396	18%	No
PV Works B.V.	Delft	4	**				20%	No
Qphox B.V.	Delft	4	2021	892	-834	0	5%	No
Qualinx B.V.	Delft	4	2017	-132	-130	248	11%	No
Respyre B.V.	Amsterdam	4	2021	26	10	63	20%	No
Sandgrain B.V.	Delft	4	**				40%	No
Scrapscanner B.V.	Delft	4	2022	-338	-8	0	30%	No
So IvGE B.V.	Delft	4	**				10%	No
Soundcell Holding B.V.	Delft	4	**				17%	No
STAND IP B.V.	Delft	4	**				20%	No
Stokhos B.V.	Amsterdam	4	2019	102	-298	206	0%	No
Tiler B.V. (Fesla Charge)	Delft	4	2021	-85	-86	130	24%	No
TUDesc B.V.	Delft	4	2020	-1	-3	5	20%	No
Umincorp B.V.	Delft	4	2021	15,972	-6,930	1,587	11%	No
Vertigo Technologies B.V.	Delft	4	2018	1	1	85	22%	No
Vibro Twist	Delft	4	**				33%	No
Villari Holding B.V.	Delft	4	2021	-85	-63	17	10%	No
VSParticle Holding B.V.	Delft	4	2021	1,950	-903	303	8%	No
Wegain B.V.	Delft	4	**				25%	No
Whiffle Holding B.V.	Delft	4	2021	233	374	1,036	8%	No
Zero Energy Development B.V.	Delft	4	**				18%	No

***: no financial figures were available at the time of preparation of these financial statements

Explanation of activity code

- 1 = contract education
- 2 = contract research
- 3 = real estate
- 4 = other Activity code

Standards of Remuneration Act (SRA)

The Standards of Remuneration Act applies to TU Delft. The applicable maximum remuneration for TU Delft is € 216000 in 2022.

Complexity points per criterion:

1A Total income	10
1B Total of funded students	4
1C The weighted number of types of education or sectors	5
Total	19

With a total of 19 complexity points, TU Delft is classified into category G of the regulations on the remuneration of senior officials in the Education, Culture and Science sectors.

1. Remuneration of senior officials

1a. Executive senior officials with an employment relationship and executive senior officials without an employment relationship from the 13th month of the fulfilment of duties as well as those who are still considered senior officials for a further four years on the basis of their previous position, in so far these officials are not included in Table 1b.

Data 2022

amounts x € 1	Prof.dr.ir. T.H.J.J. van der Hagen	Prof.dr. R.F. Mudde	Mw. Drs. M.E. van der Meer
Job details	Rector Magnificus/ President	Vice Rector Magnificus/ Vice President	Vice President Operations
Commencement and termination of duties in 2022	01/01 – 31/12	01/01 – 31/12	01/01 – 31/12
Part-time factor in FTEs	1.0	1.0	1.0
(Fictitious) employment relationship?	yes	yes	yes
Remuneration			
Remuneration plus taxable expense allowances	€ 191,909	€ 191,909	€ 191,909
Remuneration payable in the future	€ 24,091	€ 24,091	€ 24,091
<i>Subtotal</i>	<i>€ 216,000</i>	<i>€ 216,000</i>	<i>€ 216,000</i>
Individual applicable maximum remuneration	€ 216,000	€ 216,000	€ 216,000
-/- Undue payment	N/A	N/A	N/A
Total remuneration	€ 216,000	€ 216,000	€ 216,000
Reason why the excess is or is not permitted	N/A	N/A	N/A
Explanation of the claim due to undue payments	N/A	N/A	N/A

Data 2021

amounts x € 1	Prof.dr.ir. T.H.J.J. van der Hagen	Prof.dr. R.F. Mudde	Mw. Drs. M.E. van der Meer
Job details	Rector Magnificus/ President	Vice Rector Magnificus/ Vice President	Vice President Operations
Commencement and termination of duties in 2021	01/01 – 31/12	01/01 – 31/12	01/08 – 31/12
Part-time factor in FTEs	1,0	1,0	1,0
(Fictitious) employment relationship?	yes	yes	yes
Remuneration			
Remuneration plus taxable expense allowances	€ 185,185	€ 184,906	€ 77,697
Remuneration payable in the future	€ 23,815	€ 24,094	€ 9,911
<i>Subtotal</i>	<i>€ 209,000</i>	<i>€ 209,000</i>	<i>€ 87,608</i>
Individual applicable maximum remuneration	€ 209,000	€ 209,000	€ 87,608
Remuneration	€ 209,000	€ 209,000	€ 87,608

1c. Supervisory senior officials

Data 2022

amounts x € 1	Ir. T.J.G. Collot d'Escury	Prof.dr. L.L.G. Soete	Drs. G. de Zoeten
Job details	Chairman	Member	Member
Commencement and termination of duties in 2022	01/01 – 31/12	01/01 – 31/12	01/01 – 30/11
Remuneration			
Remuneration	€ 29,160	€ 19,440	€ 17,789
Individual applicable maximum remuneration	€ 32,400	€ 21,600	€ 19,765
-/- Undue payment	N/A	N/A	N/A
Remuneration	€ 29,160	€ 19,440	€ 17,789
Reason why the excess is or is not permitted	N/A	N/A	N/A
Explanation of the claim due to undue payments	N/A	N/A	N/A

Data 2021

amounts x € 1	Ir. T.J.G. Collot d'Escury	Prof.dr. L.L.G. Soete	Drs. G. de Zoeten
Job details	Chairman	Member	Member
Commencement and termination of duties in 2021	01/07 – 31/12	01/01 – 31/12	01/01 – 31/12
Remuneration			
Remuneration	€ 13,086	€ 17,651	€ 17,651
Individual applicable maximum remuneration	€ 15,804	€ 20,900	€ 20,900

Data 2022

amounts x € 1	Mw. drs. C.G. Gehrels	Mw. Ir. H.L. Wachters
Job details	Member	Member
Commencement and termination of duties in 2022	01/01 – 31/12	01/01 – 31/12
Remuneration		
Remuneration	€ 19,440	€ 19,940
Individual applicable maximum remuneration	€ 21,600	€ 21,600
-/- Undue payment	N/A	N/A
Remuneration	€ 19,440	€ 19,940
Reason why the excess is or is not permitted	N/A	N/A
Explanation of the claim due to undue payments	N/A	N/A

Data 2021

amounts x € 1	Mw. drs. C.G. Gehrels	Mw. Ir. H.L. Wachters
Job details	Member	Member
Commencement and termination of duties in 2021	01/01 – 31/12	01/01 – 31/12
Remuneration		
Remuneration	€ 17,651	€ 17,651
Individual applicable maximum remuneration	€ 20,900	€ 20,900

3. Salary of non-senior officials

Data 2022

amounts x € 1	Dean	Dean	Dean
Job details			
Part-time factor in FTEs	1.0	0.2	1.0
Remuneration			
Remuneration plus taxable expense allowances	€ 198,627	€ 73,554	€ 197,309
Remuneration payable in the future	€ 24,292	€ 1,105	€ 24,401
Total remuneration	€ 222,919	€ 74,659	€ 221,710
Individual applicable maximum remuneration	€ 216,000	€ 43,200	€ 216,000
Mandatory justification in case of an excess of the individual applicable maximum remuneration	Reward for exceptional performances	Reward due to labour market considerations and maintaining qualified employees	Salary in accordance with previously agreed contract and adjustments in accordance with Collective Labour Agreement, including compensation for pension capping.

Data 2021

amounts x € 1	N/A	N/A	Dean
Job details			
Part-time factor in FTEs			1,0
Remuneration			
Remuneration plus taxable expense allowances			€ 191,460
Remuneration payable in the future			€ 23,959
Total remuneration			€ 215,419

Signed in Delft, 22 May 2023

On behalf of the Executive Board,

Prof.dr.ir. T.H.J.J. van der Hagen
Rector Magnificus / President

Prof.dr. R.F. Mudde
Vice Rector Magnificus /
Vice president

Mw. Drs. M.E. van der Meer
Vice President Operations

Signed in Delft, 22 May 2023

On behalf of the Supervisory Board

Ir. T.J.G. Collot d'Escury

Prof.dr. L.L.G. Soete

Mw. drs. M.J.J. van Beek

Mw. drs. C.G. Gehrels

Mw. Ir. H.L. Wachters

11. OTHER INFORMATION

Reference to the auditor's opinion

The independent auditor's report shall be added separately.

Treasury policy & investment and pledge regulations

TU Delft carries out its treasury transactions in accordance with the TU Delft treasury policy. The treasury policy focuses mainly on identifying – and, where necessary, covering – risks relating to temporary surplus of cash and cash equivalents, and maximising the interest earned on these.

The content of the treasury policy was amended in accordance with the Investment, Loan and Derivatives Regulations for Educational and Research Institutions 2016, which were finalised by the Ministry of Education, Culture and Science on 6 June 2016.

For the full treasury policy is referred to the report of the Executive Board.



The following is an English translation of the independent auditor's report issued 22 May 2023

Independent auditor's report

To: the supervisory board and executive board of Technische Universiteit Delft

Report on the financial statements 2022 included in the annual report

Our opinion

We have audited the financial statements 2022 of Technische Universiteit Delft, based in Delft.

In our opinion:

- The financial statements included in this annual report give a true and fair view of the financial position of Technische Universiteit Delft as at 31 December 2022, and of its result for the year 2022 in accordance with the Regeling jaarverslaggeving onderwijs (Education Reporting Regulation)
- The income and expenditures recognized in these financial statements, as well as the movements in the balance sheet in 2022, have been legitimately generated in all material respects in accordance with the provisions contained in the relevant laws and regulations, as included in Section 2.3.1. Referentiekader (frame of reference) of the Onderwijsaccountantsprotocol OCW 2022 (Auditing Protocol for Auditors in the Education Sector OCW 2022).

The financial statements comprise:

- The consolidated and company balance sheet as at 31 December 2022
- The consolidated and company statement of income and expense for the year 2022
- The notes comprising of a summary of the accounting policies and other explanatory information

Basis for our opinion

We conducted our audit in accordance with Dutch law, including the Dutch Standards on Auditing and the Onderwijsaccountantsprotocol OCW 2022. Our responsibilities based on these are further described in the Our responsibilities for the audit of the financial statements section of our report.

We are independent of Technische Universiteit Delft in accordance with the Verordening inzake de onafhankelijkheid van accountants bij assurance-opdrachten (ViO, Code of Ethics for Professional Accountants, a regulation with respect to independence) and other relevant independence regulations in the Netherlands. Furthermore we have complied with the Verordening gedrags- en beroepsregels accountants (VGBA, Dutch Code of Ethics).

We believe the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Compliance with anti-cumulation provision of WNT is unaudited

In accordance with the Controleprotocol WNT 2022 (WNT Auditing Protocol 2022), we did not audit the compliance with the anti-cumulation provision in Section 1.6a of the WNT and Section 5(1) (n and o) of the Uitvoeringsregeling WNT (WNT Implementation Regulation). Therefore, we did not audit whether or not a remuneration maximum was exceeded by a senior management official as a result of possible employment as senior management official at other institutions that are subject to the WNT, nor did we audit whether the required disclosure is accurate and complete in this respect.

Report on other information included in the annual report

In addition to the financial statements and our auditor's report thereon, the annual report contains other information that consists of:

- The management board report
- Other information as required by Part 9 of Book 2 of the Dutch Civil Code

Based on the following procedures performed, we conclude that the other information:

- Is consistent with the financial statements and does not contain material misstatements
- Contains the information as required by the Regeling jaarverslaggeving onderwijs and the relevant laws and regulations as included in Section 2.2.2. Bestuursverslag (management board report) of the Onderwijsaccountantsprotocol OCW 2022

We have read the other information. Based on our knowledge and understanding obtained through our audit of the financial statements or otherwise, we have considered whether the other information contains material misstatements. By performing these procedures, we comply with the requirements of the Regeling jaarverslaggeving onderwijs, Section 2.2.2. Bestuursverslag of the Onderwijsaccountantsprotocol OCW 2022 and the Dutch Standard 720. The scope of the procedures performed is substantially less than the scope of those performed in our audit of the financial statements.

The executive board is responsible for the preparation of the other information, including the board report and the other information as required by Part 9 of Book 2 of the Dutch Civil Code in accordance with the Regeling jaarverslaggeving onderwijs and the relevant laws and regulations as included in Section 2.2.2. Bestuursverslag of the Onderwijsaccountantsprotocol OCW 2022.

Description of responsibilities for the financial statements

Responsibilities of the executive board and the supervisory board for the financial statements

The executive board is responsible for the preparation and fair presentation of the financial statements in accordance with the Regeling jaarverslaggeving onderwijs. Furthermore, the executive board is responsible for legitimately generating the income and expenditures recognized in the financial statements and the movements in the balance sheet, in accordance with the provisions contained in the relevant laws and regulations, as included in Section 2.3.1. Referentiekader of the Onderwijsaccountantsprotocol OCW 2022. In this respect, the executive board is also responsible for such internal control as the executive board determines is necessary to enable the preparation of the financial statements and compliance with relevant laws and regulations, without material misstatements, whether due to fraud or error.

As part of the preparation of the financial statements, the executive board is responsible for assessing the education institution's ability to continue as a going concern. Based on the financial reporting framework mentioned, the executive board should prepare the financial statements using the going concern basis of accounting unless the executive board either intends to liquidate the education institution or to cease operations, or has no realistic alternative but to do so. The executive board should disclose events and circumstances that may cast significant doubt on the education institution's ability to continue as a going concern in the financial statements.

The supervisory board is responsible for overseeing the financial reporting process of the education institution.

Our responsibilities for the audit of the financial statements

Our responsibility is to plan and perform the audit engagement in a manner that allows us to obtain sufficient and appropriate audit evidence for our opinion.

Our audit has been performed with a high, but not absolute, level of assurance, which means we may not detect all material errors and fraud during our audit.

Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements. The materiality affects the nature, timing and extent of our audit procedures and the evaluation of the effect of identified misstatements on our opinion.

We have maintained professional skepticism throughout the audit and have exercised professional judgment where relevant, in accordance with Dutch Standards on Auditing, the Onderwijsaccountantsprotocol OCW 2022, ethical requirements and independence requirements.

Our audit included among others:

- Identifying and assessing the risks of material misstatement of the financial statements, whether due to fraud or error, illegitimately generating of income and expenditures as well as movements in the balance sheet that are of material importance
- Designing and performing audit procedures responsive to those risks, and obtaining audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control
- Obtaining an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the internal control of the education institution's internal control
- Evaluating the appropriateness of accounting policies used, the financial criteria applied for legitimacy and the reasonableness of accounting estimates and related disclosures made by the executive board

- Concluding on the appropriateness of the executive board's use of the going concern basis of accounting, and based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the education institution's ability of to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause an institution to cease to continue as a going concern
- Evaluating the overall presentation, structure and content of the financial statements, including the disclosures
- Evaluating whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation and whether the income and expenditure recognized in the financial statements as well as movements in the balance sheet have in all material respects been legitimately generated

Because we are ultimately responsible for the opinion, we are also responsible for directing, supervising and performing the group audit. In this respect we have determined the nature and extent of the audit procedures to be carried out for group entities. Decisive were the size and/or the risk profile of the group entities or operations. On this basis, we selected group entities for which an audit or review had to be carried out on the complete set of financial information or specific items.

We communicate with the supervisory board regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant findings in internal control that we identify during our audit.

Rotterdam, 22 May 2023

Ernst & Young Accountants LLP

signed by M. Verschoor

