Building transformative capacities to accelerate the urban energy transition

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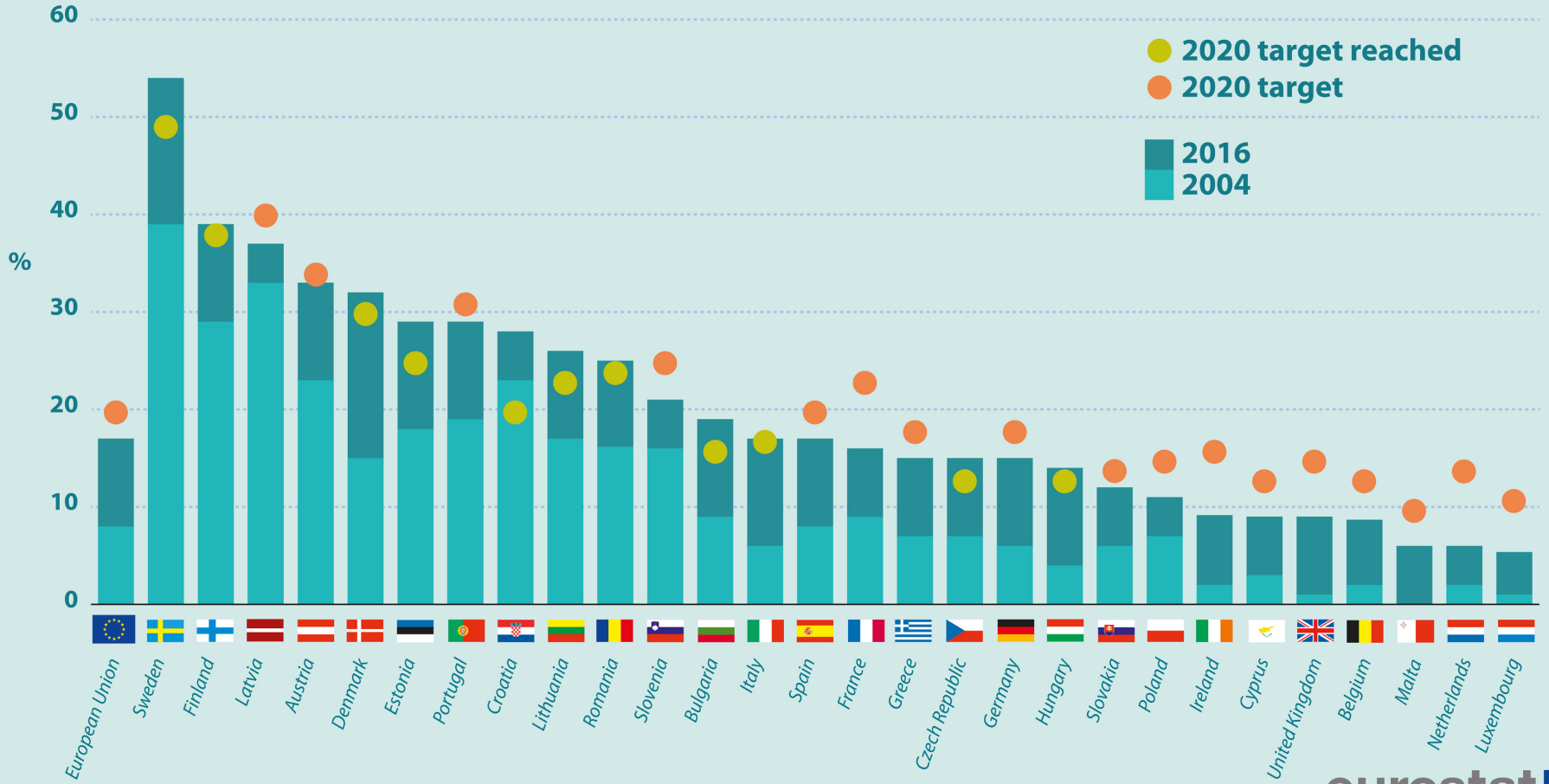
Plan for this presentation

- Is the energy transition moving into a new phase?
  - From small-scale experiments to systemic change
- How does this development create new challenges and frictions?
  - Examples from different energy areas
- Swedish Viable Cities programme as an example
  - Climate-neutral cities 2030
- Need for new strategies, capacities and competences in municipalities

Share of energy from renewable sources in the EU Member States

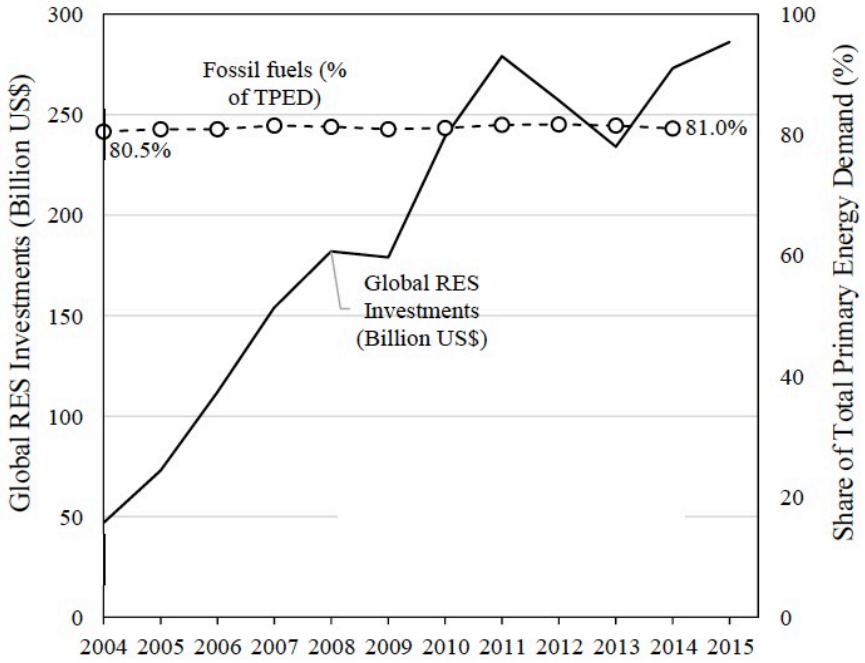
(in % of gross final energy consumption)



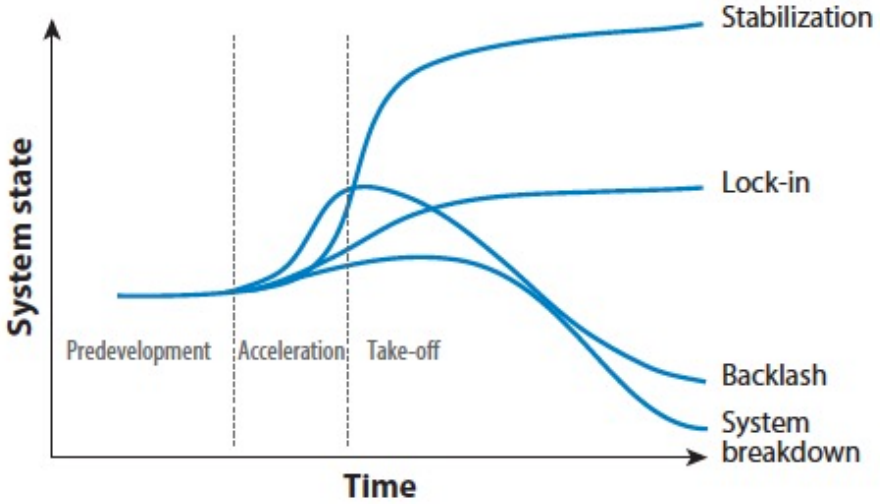
Source: EUROSTAT, 2018, https://ec.europa.eu/eurostat/statistics-explained/index.php/Renewable_energy_statistics#Renewable_energy_produced_in_the_EU_increased_by_two_thirds_in_2006-2016

A new phase in the energy transition?

- Increasing indications of an ”acceleration phase” of the energy transition
  - But: careful about this assumption in global perspective!
- Cities as key actor / arena of such a transition
- Different from early phase with focus on emerging technologies, niche development, R&D, building networks etc.
- Need for different governance mechanisms?
  - capacities for transformative change



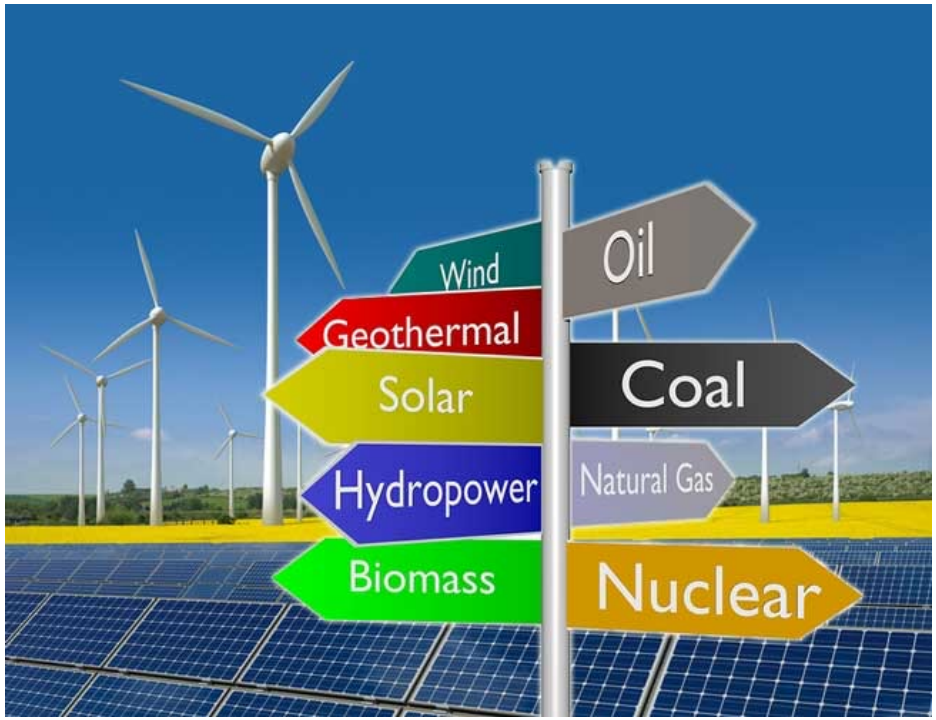
Source: Filip Johnsson, Jan Kjärstad & Johan Rootzén (2018):
The threat to climate change mitigation posed by the abundance of fossil fuels, *Climate Policy*, DOI: 10.1080/14693062.2018.1483885



Loorbach, D., Frantzeskaki, N. and Avelino, F. (2017). 'Sustainability Transitions Research: Transforming Science and Practice for Societal Change', *Annual Review of Environment and Resources* 42(1): 599-626

A shift in focus…

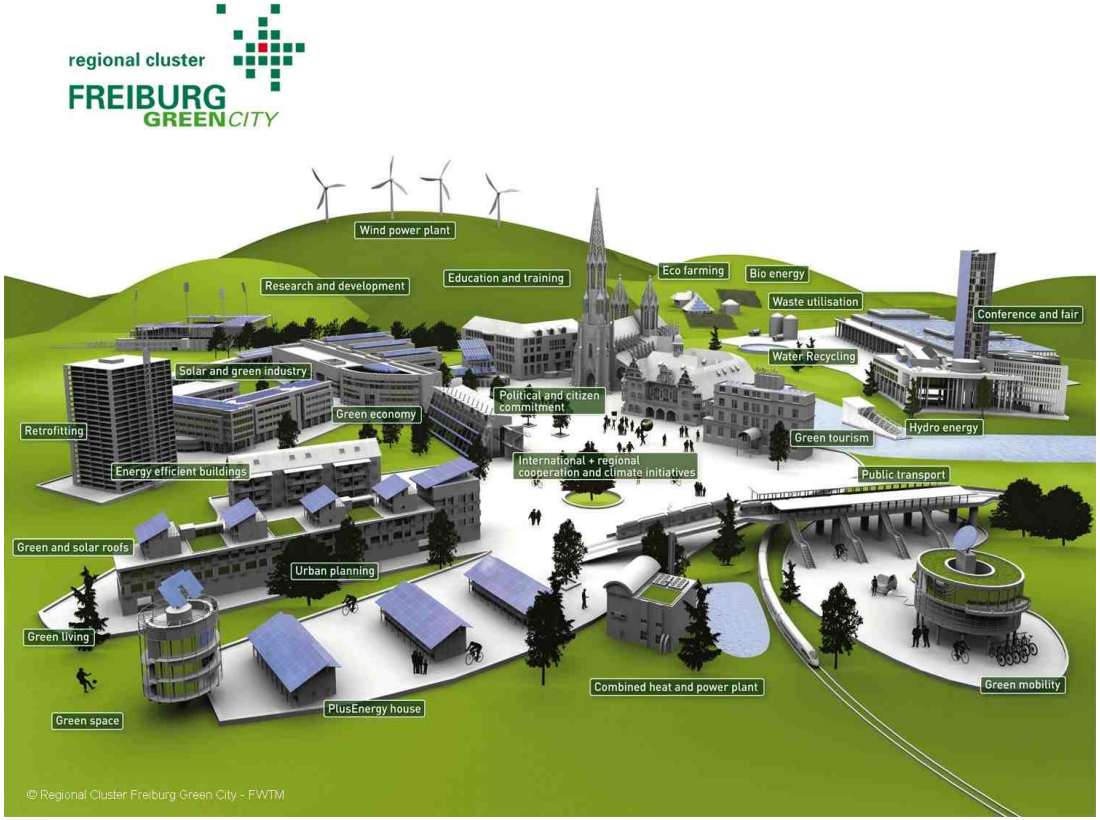
- An accelerated energy transition puts transformation of established system in focus
  - mainstreaming and embedding of such technologies, complementary technologies, different policies
  - Different strategies for incumbents, newcomers
  - potential of substantially disturbing existing socio-economic arrangements and natural environments
- Shifts focus to questions of interaction, system integration, and reconfiguration of whole energy systems



Source: https://eeueuropa.eu/european-renewable-energy-2016/

New challenges and friction zones

- New forms of competition between sustainable energy technologies
  - Passive houses – district heating
  - Biogas - electrification in transport
- Frictions with current regulations, sector structures, business models
  - Energy communities, micro-grids
- Discontinuation and phasing-out
- Deep transitions, multi-sector interaction, integration of policy goals – e.g. social policy and climate mitigation measures
- Most cities are not much prepared for such challenges



Frictions between sustainable energy configurations

- Building efficiency vs. heat supply in Freiburg
  - Vauban as ecological model district
- New friction zones: conflicts between district heating and new building standards
  - Wider dissemination of passive houses (decentral, heating systems often electric)
  - vs supply interests for district heating (obligation to connect; profitability of municipal companies)
- Sweden: Conflicts about calculations and weighting of nearly-zero energy buildings – district heating vs on-site renewable energy generation
  - Conflicts created by move to systemic level; strong local/municipal dimension
  - Lots of ’ad hoc politics’ in how these tensions were handled

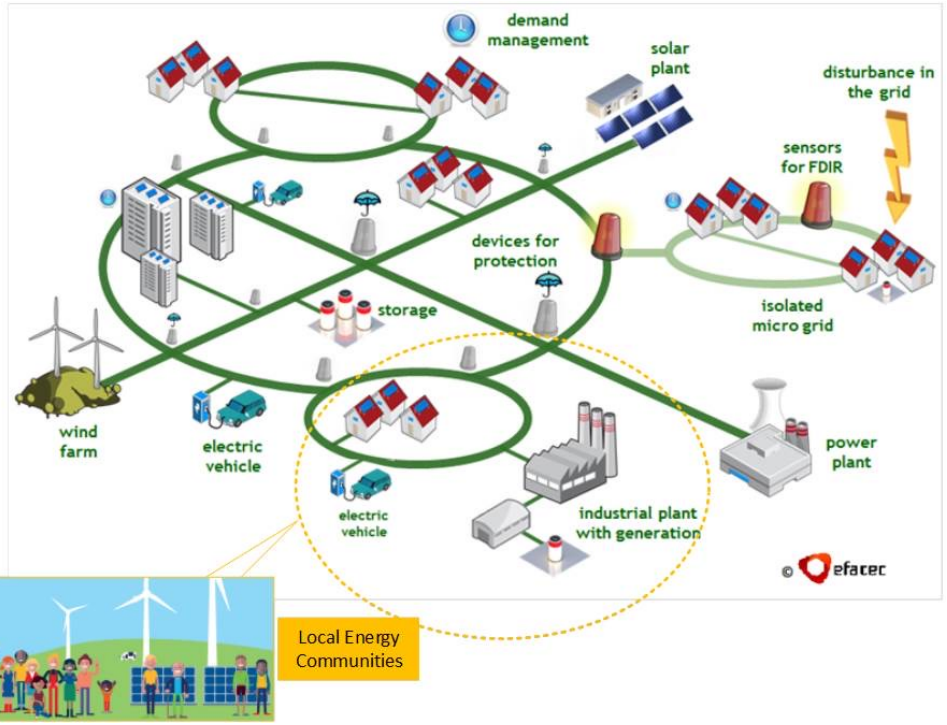
Fossil-free transport futures

- High share of biogas in urban bus transport in Sweden
  - Linköping 100% through municipal utilities
  - Integrated with waste collection, organic waste
- Increased competition from electrified busses
  - Powerful global socio-technical imaginary becomes dominant
  - Linked to modernity, autonomous vehicles, cleanness
  - Very different (scalar) structure of discourse, alliances etc.
  - Biogas more obdurate in certain cities due to local embedding, identity, governance structures
- Difficulties to deliberately handle such frictions at municipal level

Integrated local energy systems

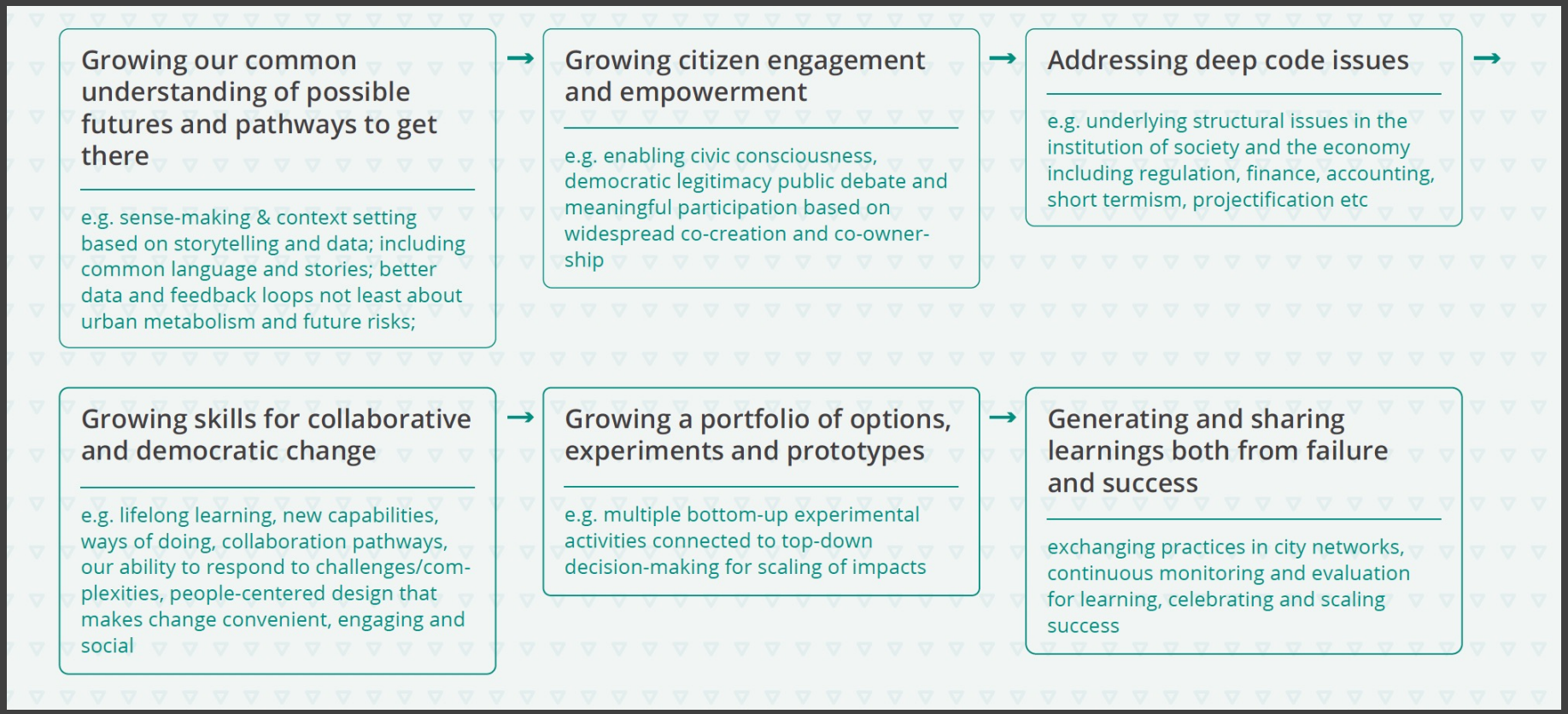
Local system integration through microgrids, sharing of electricity, positive energy districts

- New ‘infrastructural communities’
- Broad range of organisational forms
  - Utility-driven, municipality-led, housing organisations, citizens etc.
  - Regulatory innovations needed
- Raises various questions at municipal level
  - Public vs private vs community.. Who owns and operates microgrid?
  - Who is the system integrator of energy communities/districts?
  - New business models?
  - Conflicts with current regulatory system..
- Creates new kinds of challenges for urban (energy) planning and management



Source: http://www.incite-itn.eu/blog/introducing-microgrids-local-energy-communities/


recuperation from sickness
3 5
Increase in residential greenery leading to increase in birthweight
3
Increase in bird species diversity leading to increase in life satisfaction
14
Reduction in motor vehicle use and decrease in microplastics in seas and oceans
8 9 11
Increase in active travel and walkability, and reduction in cars, leading to increase in retail spend
Biodiversity
Property
Commerce
3
Increase in nearby green spaces leading to increase in walking maintenance
11 13 15
Increase in local biodiversity leading to decrease in urban heat island effect
3
Increase in active travel leading to increase in mental and physical health and wellbeing
8 9 10
Increase in property value (if desired) due to walkable environments
3 8 11 13
Increase in urban trees leading to decrease in building air conditioning and increase in worker productivity
11 12 13
Carbon reduction and increased environmental outcomes via coordinated e-commerce delivery
3 10 16
Increase in mental and physical wellbeing leading to reduction in healthcare costs
8 9 10 11
Increase in retail and office rental value and occupancy levels via green, walkable environment, without increase in housing rent
8 9 11 16
Sustainable shared and equitable infrastructure for micromobility technologies
3 12 13 15
Increase in community gardening leading to increase in mental and physical health and wellbeing
3
Decrease in urban heat island effect leading to decrease in early deaths
8 9 11 12 13
Increased environmental outcomes via shared electric mobility infrastructure
Environment
Physical activity
3 10 16
Increase in residential green space and access to nature beneficial for intellectual and behavioral development of children living in urban areas
3
Greener play areas boost children's immune systems
3
Increase in active travel leading to improved immunosurveillance against pathogens
5
Decrease in domestic violence due to nearby natural landscapes
3 11
Increase in neighbourhood tree cover leading to better overall health mediated by lower obesity and better social cohesion
Maintenance
Learning
3
Reduction in car use and decrease in brain cancer
3 10 16
Increase in childrens' play and sociability in play streets
11 13 16
Decrease in stormwater-related maintenance costs through increased green infrastructure
3
Increase in active travel leading to improved immunosurveillance against pathogens
1 4 10
Increase in childrens' social mobility in walkable neighbourhoods
Health and wellbeing
3
Decrease in child deaths due to decreased car use near schools
3
Decrease in road traffic accidents with reduction in motor vehicles and decrease in traffic speed
10 16
Decrease in maintenance costs through shared management
10 11 16
Increase in publicly-accessible neighborhood nature increases sense of community
8 9 11 16
Improvement in community participation and municipal governance via public prototyping of civic tech platforms
11 13 15
Increase in sustainable timber street furniture, versus concrete, leading to increase in carbon sink and decrease in carbon dioxide
3
Lively, activated streetscapes and facades lead to increase in positive affect and lively, attentive nervous system, and decrease in poor mental health
Social fabric
3
Increase in physical activity and decrease in cardiovascular diseases
3
Increase in air quality leading to decrease in early deaths
3 10 11 16
Community participation improves perceptions of pedestrian environment and neighborhood safety, and decreases stigma toward individuals with mental health or substance abuse challenges
3 10 11 16
Increase in social infrastructure leading to increase in social interaction and increased community resilience
10 16
Increase in social interaction leading t reduction in social care costs



Strategic Innovation Programme “Viable Cities”

- Strategic Innovation Programme Viable Cities: mission-orientation, 2017-2030
- Broad portfolio of smart and sustainable city projects – about 100 mio € over 12 years
- Joint learning and collaboration of involved cities
- Aim to provide intelligence and structural support for urban transformation
- So far significant impact on Swedish policy landscape

Klimatneutrala städer 2030

ViableCities
Smart, sustainable and attractive.

Climate-Neutral Cities 2030

- 23 participating cities need to develop mission-programme for climate-neutrality
- Setting-up municipal innovation teams, testing new ways for working with climate-transition
- Viable Cities TransitionLab as learning platform / strategic backbone
- Climate-contract between cities and government about achievement of goals, mutual obligations (adaptation of legal framework, funding etc.)
- Emphasis also on follow-up process

EUROPEAN UNION

European
Missions

100 Climate-Neutral and Smart Cities by 2030

Info Kit for Cities

Model for European Mission Programme

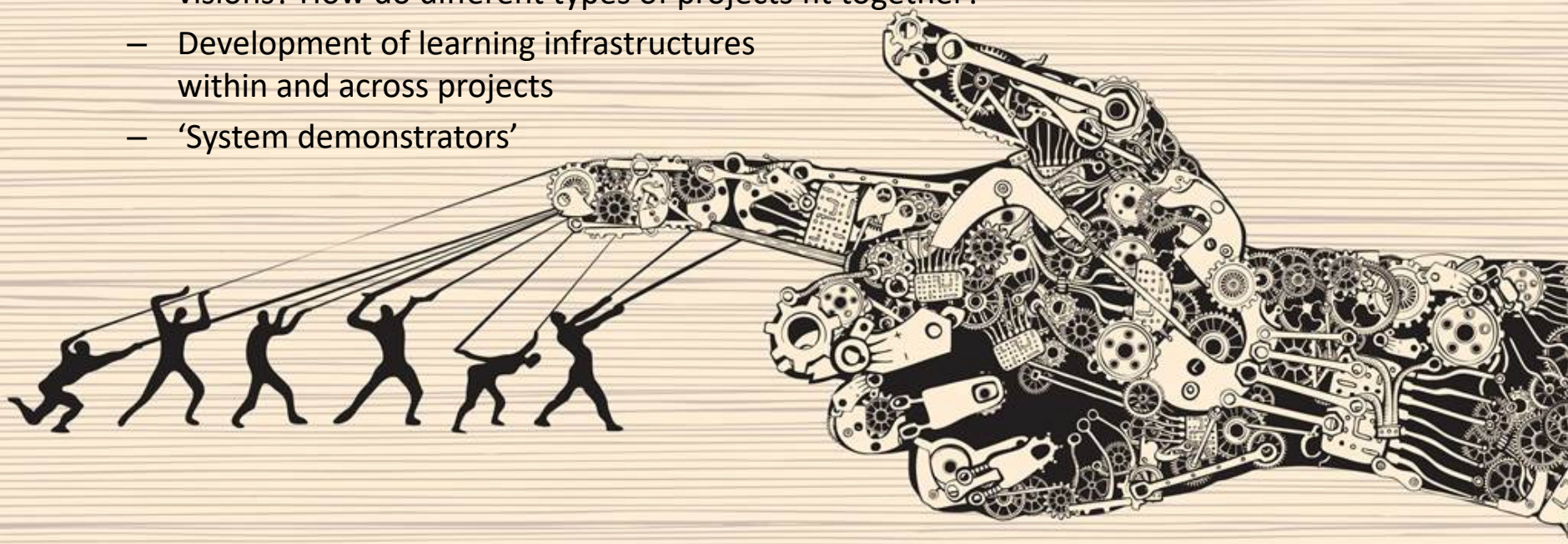
Capacities for transformative change

- Acceleration phase / Climate-neutral cities 2030 creates new challenges for governing transformative change
  - No appropriate structures and procedures in cities so far
  - Which new capacities and capabilities needed? Which new organisational structures and procedures?
  - Challenge of long-term orientation (beyond election cycles), context of uncertainty, wickedness, cross-sectoral nature of problem, need to integrate multiplicity of actors etc.

- Project Accelerera
  - Aim to develop support structures for cities to increase their transformative innovation capacities

Example 1: Beyond experiments

- How can the transformative impact/embedding of experiments be increased?
- How can these ambitions be reflected in organisational structures and processes?
  - Portfolio of transition experiments – How do they contribute to directionality/ long-term visions? How do different types of projects fit together?
  - Development of learning infrastructures within and across projects
  - 'System demonstrators'



  - Different strategies of scaling up / broadening / deepening?
  - Working more systematic with visions / scenarios / backcasting
  - Handling different logics simultaneously - public sector logic vs experimental logic (e.g. in planning processes)
- Ongoing work with support structures to better deal with systemic innovation

Example 2: A new context for evaluation

- Transformative innovation poses new challenges for evaluation
  - 'Wicked problems': no simple solutions. How do we define success?
  - Temporality: long-term orientation of change. When do outcomes become visible?
  - Activities fragmented into many projects and experiments.
    How to attribute impact?
    How to capture indirect effects/outcomes of projects?
  - Part of broader socio-political change: not just matter of innovation policy.
    Who is accountable for change?
- Ongoing work with new forms of real-time, formative monitoring and evaluation
  - How to integrate such structures in climate contracts?

Instead of a conclusion: Positive energy districts

- Current discussions about positive energy districts are an interesting case for how such questions are related to transformative capacities
- Typically, much focus is put on measuring or modelling the performance of such districts, defining boundaries etc.
- If one shifts the focus to a more process-oriented perspective, new transition-related challenges move to the centre:
  - How can a whole system approach be taken? What does this mean for planning procedures, who owns or coordinates the district?
  - How can various local stakeholders and people living in the district be involved who are in the end essential to make such a district work?
  - How can questions of learning, upscaling or replication be built into the design of such a district? How does it contribute to an urban transition?

Thank you for your attention!

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