Attachment 1. Technical, industrial and business model parameter-option matrices

	Parameter		Sub-parameter			Design options per parameter			
							TP1.1-1	Renewable material	1,2,5-7,9,11-13,15,16,18-21,23-25,28,30,34
						2,3,5-7,9,11,13,16-	TP1.1-2 TP1.1-3	Bio-based material Non-toxic (healthy) material	1,3,5,6,13,16,20,23-25,27,30 5-7,9,11,13,15,18-20,22,23,25,26,29,30,34
				TP1.1	Biological materials	21,23-25,29,30,33-36	TP1.1-3	Safe material	2,3,5,6,11,23-25
	TD4	Materials /					TP1.1-5	Low-impact material	6,9,16,20,23,24,27,33
	TP1	resources	1-36				TP1.1-6	Biodegradable material	1,3,5,6,9,11-13,16-18,23-25,34,36
							TP1.2-1	Durable or high-quality material	3,6,7,13,16,18,20,23,25,26,29,30,34
				TP1.2	? Technological materials	2,3,5-7,9,11,13,16- 25,29,30,33-36	TP1.2-2 TP1.2-3	Virgin material Recyclable material	1,3,6,7,12,16,19-22,26,27,32-34 1,4,6-9,11-13,15,16,18-21,23-26,28,29,33,34
						20,20,00,00	TP1.2-4	Non-virgin (i.e., re-used, recycled) material	1-3,5-9,12,13,16,18-21,23-27,29,33,34
							TP2.1-1	Natural gas	
							TP2.1-2	Grey power (i.e., electricity from fossil resources)	18,30
							TP2.1-3	Diesel / petrol	18,21,30
							TP2.1-4 TP2.1-5	Bio gas / biofuel Hydrogen power	9,21
		Energy	1-7.9-13.		Type of energy	1-7,9-11,18,	TP2.1-6	Green alternating current (e.g., transformed electricity from PV-cells)	30
	TP2		15-33, 35, 36	TP2.1	Type of energy (in use phase)	19,21,23,27,30,	TP2.1-7	Green direct current (e.g., electricity from PV-cells)	18
					(33,35,36	TP2.1-8 TP2.1-9	Heat from thermal storage On-site pre-heating (e.g., horizontal ground loop)	18
							TP2.1-10	City heating	
							TP2.1-11	Block heating	
							TP2.1-12	Off-site power (i.e., grid energy)	18,30 18,36
							TP2.1-13 TP3.1-1	On-site power (i.e., independent generated power) Built environment	7,13,19
							TP3.1-2	Building	3,7,13,19,20,32
		System	1,3,4,6,12-			1-4,6,8,12-	TP3.1-3	Building component	7,13,19,20,32
	TP3		14,18,19,22,25 .29.30.32.33.3	TP3.1	System elements	14,16,18,19,22,	TP3.1-4 TP3.1-5	Product (Sub-)component	1-7,9-36 1,3-7,9,12-15,18-26,29,32-35
		Architecture	,29,30,32,33,3 5			25,29,30,33,35	TP3.1-6	(Sub-)component Part	1,3-7,9,12-15,18,20-22,24,26,27,29,33-35
							TP3.1-7	Material	1-36
							TP3.1-8	Resource	1,5,7-11,13,15-34,36
	TD4	Amount	1,4-10,12,13, 16-19,21,24,	TD44	Amount of elements or	1,4-10,12,16,18,19,21,	TP4.1-1	Number of system elements (i.e., number of products, parts)	16,17,30,34
	174	Amount	16-19,21,24, 25,29-34	TP4.1	resources	24,25,29-32,34	TP4.1-2	Amount of resources (e.g., in [kg], [m3], [kwh])	4,7-9,12,16,21,25,29,32
							TP5.1-1	Single lifecycle	4,19,21,23,25-28,34
				TP5.1	1 Amount of lifecycles 2 Expected lifespan	1-7,9-13,15-30,32-35	TP5.1-2	Multiple lifecycles	1,3,4,6,10,16-18,20-23,25-27,33,34
	TD-	Time (-)	1-23,25-30,			1-7,9-16,18-27,29-35	TP5.2-1	Very short	16
	125	Time(s)	32-35	TDE O			TP5.2-2	Short	1,3,7,11,13,16,18-20,22,23,25,32
				1P5.2			TP5.2-3 TP5.2-4	Medium Long	1-5,7,9-11,13,15,16,18-22,25-27,30-32,34,35
							TP5.2-5	Very long	29
					Lifecycle stage of 1 building component,	3, 18, 24, 33	TP6.1-1	Introduction	3,18
	TP6	Lifecycle	3, 18, 24, 33	TP6.1			TP6.1-2	Growth Maturity	3,18 3,18,33
		stage			part, material		TP6.1-3 TP6.1-4	Decline	3,18
					TP7.1 Design for material reduction		TP7.1-1	Reduce material by making (building)component not needed or digital	7,9,20,22,24,30,33
<u></u>							TP7.1-2	Apply re-used, recycled, or low-impact materials	6,9,13,15,16,23,24,33
ğ						3-5,7-10,12,13,15,16,18 action 21,23-27,29,31,33	TP7.1-3 TP7.1-4	Find local industrial symbiosis for needed resources Reducing material in (re)production (e.g., less cutting losses)	5,8,9,18,21,23 7,9,13,16,19,23-25,29
echnical mode							TP7.1-5	Reducing material in (re)production (e.g., less cataling losses) Reducing packaging material (i.e., light weighting or minimisation)	9,15,23,25
				ᄚ			TP7.1-6	Reduce material in building component (i.e., light weighting, remove	3,5,7,9,13,16,19,21,23-25,29,32,33
				ŏ				redundant parts, minimise the building component)	
				ng			TP7.1-7 TP7.1-8	Reduce use-phase material (i.e. water, consumables) Use bio-inspired (biomimetic) design for biological loop designs	7,9,25 6,18,19,23-25
e.				į				Reduction or smart-use of critical and scarce materials (e.g., critical	
-				Narrowing loops			TP7.1-9	materials only for short-cycled use)	9,17
					TP7.2 Design for energy reduction		TP7.2-1	Design for a lean, clean, green production process	3,7,9,16,20,21,23-25,27
						3,4,7,9,13,16,19, 20,23,25,27,31,33	TP7.2-2 TP7.2-3	Balance component lifespan with energy performance prospects Minimise energy in use-phase (e.g., passive design)	9 3,7,9,13,23,27
							TP7.2-4	Optimise energy efficiency in use-phase (e.g., insulate)	5,7,23,24,33
							TP7.2-5	Recover and exchange energy	13
							TP7.2-6	Use renewable energy sources in (re)production and use	6,7,11,15,18-21,23,24,28,30,33
							TP7.3-1 TP7.3-2	Design for easy use Design for high safety standards	4.9,14,19,29,33
							TP7.3-3	Add surplus quality	3,4,7,14
							TP7.3-4	Design for user trust (e.g., ensure reliability of design)	3,4,7,14,22,32
							TP7.3-5	Design for comfortable use	14
							TP7.3-6	Facilitate democratic or open-source design and use Design for emotional desirability (e.g., provide emotional relevant	3,6,13,16,20,23
							TP7.3-7	narrative, service, information, meaning)	3,11,12,14,16,22,23,25,32,34,35
					Design for	3-5,9,11,12,14,16,20-	TP7.3-8	Design for strong social value (e.g., provide services and information	14
					TP7.3 attachment	25,32,34,35		relevant to the users social environment)	
							TP7.3-9	Make a timeless base design Facilitate customisation and adjustment options to reflect user's	3,4,23,25,35
							TP7.3-10	emotional, social values, and user preferences	3,4,12,14
							TP7.3-11	Balance quality with user expectations	3,14
								Make a design which ages well and builds a personal patina	3,14
							TP7.3-13 TP7.3-14	Make an innovative (i.e., novel, sufficiently complex) design Offer upgrades to keep user interest	14 4,14,35
							TP7.3-15	Design to facilitate interaction with user (to enhance curiosity,	3.14.25
								understanding, attractiveness, attachment)	
							TP7.4-1 TP7.4-2	Consider obsolescence, growth and future scenarios Select an appropriate lifespan for the component / part / material	3,4,6,8,11,13,18,33,35 3,13,16,25,29
							TP7.4-3	Make a highly functional design	3,13,16,25,29 13,15,16,24,32
							TP7.4-4	Anticipate on new regulations	4,13,18,29,35
							TP7.4-5	Dimension for unintended / stressed use	14,23,29,35
							TP7.4-6 TP7.4-7	Over-dimension or duplicate critical parts Design out moving parts	9,13,14,35 14,35
							TP7.4-7 TP7.4-8	Design out moving parts Only include electronic parts consciously	9,18
							TP7.4-9	Evaluate, and optimise the component, (sub)components and parts on	3,5,6,14,23,25
								quality, and design-out component failures (i.e., iterative design)	
							TP7.4-10		22,35
					Design for	1,3-7,9-11,13,14,16,18,		Use durable materials Design so (sub)components and parts can withstand repetitive assembly	9,13,14,16,34
					TP7.4 reliability and	20-27,29,31-35	TP7.4-12	and disassembly	3,29
					durability		TP7.4-13	Design robust interfaces (i.e., joints or touch surfaces) between	14,29
							1. 1.4-13	components and parts	,
							_		
							TP7.4-14 TP7.4-15	Select materials which can withstand shock and vibration impacts	13,14 14,35

					TP7.4-16	Prevent discolouration of materials	14,35
					TP7.4-17	Avoid corrosive, toxic and aging materials	11,34,35
					TP7.4-18	Use (a limited variety of) compatible base materials	14
					TP7.4-19	Use compatible fastener to base materials (to prevent corrosion)	35
					TP7.4-20	Design for simple use of the designed building component	14
					TP7.4-21 TP7.4-22	Limit number of components, parts, and materials Design so dirt has no chance to build up (no edges, ridges or holes)	3,14 29
					TP7.4-23	Decomplexify the design of (sub)components and parts	3,14,24
					TP7.5-1	Company standardisation	3,14,15,18
					TP7.5-2	Industry standardisation	3,14,29
					TP7.5-3	Part standardisation	3,4,9,14,18,22,24,33-35
			Design for		TP7.5-4	(Sub)component standardisation	3,4,14,15,18,24,29,33,34
			TP7.5 standardisation	15,18,21-	TP7.5-5 TP7.5-6	Product / building component standardisation Measurement standardisation	3,4,6,14,18,34 3,13,29,33
			and compatibility	3-35	TP7.5-7	Joint standardisation	3,13,24,29,33
			and compatibility		TP7.5-8	Joint piece (i.e., adaptor) standardisation	3,14,29
					TP7.5-9	Tool standardisation	14
					TP7.5-10	Interface standardisation	4,14,22,33,35
					TP7.5-11	Performance test standardisation	35
					TP7.6-1	Make the design easy to open / accessible	3,4,9,14,18,29,32,33,35
					TP7.6-2	Position maintenance points close together	9,14,18
					TP7.6-3	Indicate handling and lifting instructions on components and parts (e.g., lifting handles, eyes)	14
				ŀ		Large (sub)components and parts should be mounted on hinges, slides	100
					TP7.6-4	or runners to offer better access during maintenance and repair	14
					TP7.6-5	Design an opening plane	35
		sd			TP7.6-6	Design for safe maintenance (e.g., avoidance of toxic materials)	9,14,18
		Ιō			TP7.6-7	Design maintenance points so personnel can keep a comfortable	14
		=				posture during maintenance.	
		Slowing loops			TP7.6-8 TP7.6-9	Design so maintenance can be done by few, and unschooled personnel Design so it can only be maintained / repaired in the right way	6,14,23 4.14
		8			TP7.6-10	Design so it can only be maintained / repaired in the right way Design so maintenance is fast	9,14,18,21,22
		Š			TP7.6-11	Optimise sequence for maintenance and repair	14,33
	1,3-7,9-16,18-				TP7.6-12	Keep cleaning and repair intensive parts accessible	3,4,14,35
	21.23-				TP7.6-13	Standardise design fit and assembly sequence	29
	TP7 design 27,29,30, 32-				TP7.6-14	Design so the 'weakest link' is easy (and cheap) to replace	14,18
	strategies 35				TP7.6-15	Provide sufficient space around parts to prevent secondary damage	14,32
					TP7.6-16	Design to allow on-site maintenance Enclosed maintenance and repair instructions	3,4,23,35 1 3 9 14 23 24 32 34
					TP7.6-17 TP7.6-18	Enclosed maintenance and repair instructions Make an uncomplicated design	1,3,9,14,23,24,32,34 12,14,18
<u>ө</u>			Design for ease of	6.18.21-	TP7.6-19	Make a modular design	1,3,4,6,7,9,12,14,17,18,20,21,23-25,29,33,35
ᄝ			TP7.6 maintenance and 25,27,29,3		TP7.6-20	Separate parts based on technical lifespan and function	3,18,29
Ĕ			repair	The same	TP7.6-21	Align the maintenance, repair and replacement cycle of	33,35
Fechnical model					11 7.0-21	(sub)components and parts	00,00
<u>.8</u>					TP7.6-22	Reduce variation in lifespans of (sub)components and parts to ease	14
ĪĒ					TD7 0 00	maintenance planning and prevent premature replacements	0.44.00
ठ					TP7.6-23 TP7.6-24	Minimise number of components and parts to ease repairs Use standardised, universally applicable components and parts	9,14,33 14,33,34
<u>1</u>						Components, parts which are often replaced need to be easy to handle	
					TP7.6-25	(i.e., standard size/weight, no sharp edges, easy to transport)	14,18
					TP7.6-26	Design (and offer) spare parts	1,3,6,9,21,24,34
					TP7.6-27	Make products stackable (to ease transport for repairs)	35
					TP7.6-28	Use fasters which allow fast maintenance and repair (no wet-joints) Select fasteners with regard to maintenance frequency	14,18,33
					TP7.6-29	and availability of tools at replacement location	14
					TP7.6-30	Minimise number of fasteners to make maintenance and repair easy	9,14,33
					TP7.6-31 TP7.6-32	Design joints which do no require tools for maintenance and repair Use smooth surfaces to ease cleaning	14 29,33,35
					TP7.6-33	Use materials that can stand cleaning and maintenance	3,29,35
					TP7.6-34	Use materials that can be easily repaired, replaced, touched-up	14
					TP7.6-35	Apply self-healing or self-cleaning materials	3,23
					TP7.6-36	Include a component and part passport	12,13,20,24,32,33
					TP7.6-37	Make the product easily testable (e.g., include self-use diagnostic tools)	
					TP7.6-38	Integrate (live)monitoring of performance in design	4,6,7,12-14,18,20,24,30,31,33,35
					TP7.7-1	Separate the component in sub-components and parts based on functional lifespan (e.g., building 'support' and 'infill')	3,12,13,14,15,18,23,29
						Separate building components into 'shearing layers': site, structure, skin,	
					TP7.7-2	services, space-plan, stuff	AND THE STATE OF T
					TP7.7-3	Make a modular design	1,3,4,6,7,9,10,12,14,15,17,18,20,21,23-25,29,33,35
			Design for		TP7.7-4	Make to-be-updated functions independent of the base of the design	12-15,18
			TP7.7 upgrades and 1,3-7,9,12-15 25,27,29,32		TP7.7-5 TP7.7-6	Design excessive functionality and performance in the component base Leave room in component / product for upgrades	13
			adjustments	_,04,00	TP7.7-6	Allow for technical, functional and aesthetic customisation	3-6,7,13,14,18,22,33
					TP7.7-8	Plan for scenario's of change	3,4,6,7,13,14,18,19
					TP7.7-9	Design (and offer) techn., funct. or aesth. upgrades & add-ons	1,3,5,9,13,14,18,23,33,34
					TP7.7-10	Design versatile parts which could perform several functions	14,24
					TP7.7-11 TP7.7-12	Use standardised (sub-)components and parts to ease updates Make products and component stackable to ease transport	3,14,15,18 3,15,35
				-	TP7.7-12	Easy (enclosed) dis-, and reassembly instructions	32,33
					TP7.8-2	Provide easy access to joining, breaking, cutting points	9,14,29,33,35
					TP7.8-3	Design for automated disassembly	29
					TP7.8-4	Use assembly methods that allow disassembly without damage to re-	9,29,33,35
					TD7 0 5	usable components	70 N 700
					TP7.8-5 TP7.8-6	Minimise number of components and parts Use standardised and modularised components	14,24,29,33,35 14,15,29,33
					TP7.8-6	Keep drainage points accessible	9,14
					TP7.8-8	Optimise and simplify sequence for dis-, and re-assembly	4,33,35
					TP7.8-9	Design so sequence independent dis-, and re-assembly is possible	33,35
					TP7.8-10	Keep one surface for grasping	14,29,33,35
						Prevent the need for turning	14,35
			Design for dis-, 3-5,9,11,13-15		TP7.8-12 TP7.8-13		14,33 29,33,35
			TP7.8 and re-assembly 25,29,31	AND THE RESERVE	TP7.8-13 TP7.8-14	Simplify and standardise components, and the dis-, and re-assembly fit Apply a loose fit for easy re-assembly	29,33,35
			und 10-assembly		TP7.8-15	Mark and label (important) disassembly joints	14,29,33,35
					TP7.8-16	Limited number of different connections	4,14,24,29,33,35
					TP7.8-17	Limited number of connections	4,9,14,18,24,29,33,35
						Apply (grasp fit) click connections	29,33,35
						Avoid or limit non-rigid parts	14,29
					TP7.8-20	Use standardised and simple joints Use easy and fast dis-, and remountable connections	14,24,33 3,4,9,13,15,18,23,24,29,33,35
						Use easy and fast dis-, and remountable connections Use easy to destroy joints	3,4,9,13,15,18,23,24,29,33,35
						Avoid wet joints (i.e., welded or poured)	4,14,29,35
						Avoid (non-solvable) adhesives	3,4,14,15,23,29,32,33,35
					TP7.8-25	Design so easy or no tools are needed for dis-, and re-assembly	4,9,18,23,24,29,33,35
					TP7.8-26	Avoid metal inserts in plastic parts	14,33,35
					TP7.8-27	Avoid materials which are likely to damage machinery	14

				TP7.9-1	Make disassembly easy, or not needed for recycling	4,18,22,29
				TP7.9-2	Use highly recyclable / biodegradable materials	4,6,7,13,18-20,23-25,27,29,33,34
	0			TP7.9-3	Anticipate material recycling / biodegradation routes	4,6,8,13,18,19,25,33
	Closing loops			TP7.9-4 TP7.9-5	Use appropriate biological or technological materials Separate parts at material boundaries (mono-materials)	6,7,16,20,23,25,29,34,35 3-6,9,13,15,16,18,20-22,24,29,32-35
_		n		TP7.9-6	Limit number of materials	4,9,14,24,29,33,35
Fechnical mode		5		TP7.9-7	Use recycling (process) compatible materials	4,13,14,18,24,29,32,33,35
l 2	9			TP7.9-8	Use common materials (to limit the number of recycling streams)	9,13,33,35
	١	Design for	3-5,7,9,13,16,18-21,23-	TP7.9-9	Use break lines (for destructive recycling)	4,33,35
Sa		TP7.9 biodegrading and	27,29,31-35	TP7.9-10 TP7.9-11	Use recycle compatible materials for base and fasteners Keep parts of the same material together	24,29,33,35 14,35
☲		recycling		TP7.9-12		14,29,33,34
등					Keep toxic materials grouped together, sealed and easy to remove	14,29,35
<u>ĕ</u>					Keep critical, valuable, re-usable parts and materials grouped together	4,33,35
					Prevent secondary (non-compliant) paint and coating	4,14,29,33,35
				TP7.9-16 TP7.9-17	Make components, parts stackable to ease re-loops	14,25,35 9,14,23,25,35
					Minimise product volume to ease relooping Provide markings or different colours to indicate material types	4,9,14,16,18,24,26,29,33,35
					Provide disposal or recycling instruction	24,32,33
					Include material passport (e.g., in BIM)	6,12,13,16,19,20,26,32
				IP1.1-1	Government	2,3,8,9,12,17,18,20-22,24-26,29-32
				IP1.1-2	Building owner	13,19
				IP1.1-3	Expert (e.g., designers, consultants)	1-3,6,8,11,13,15-19,21,24-26,31-33
				IP1.1-4	Third-party financier	2,6,10,13,18,31,32
				IP1.1-5	Material supplier	1-3,6,17-22,26-28,32,33
				IP1.1-6 IP1.1-7	Part supplier Manufacturer (e.g., product, building component manufacturer)	2,3,5,7,9,14,15,17-22,28,33 1-7,9,10,12-18,20-22,24,26-28,30-34
				IP1.1-8	Transporter	2.4.5.8.18.21.26
	Key 1-11,13,15,17-	Partners in supply chair	1-11 12 15 17 20 20	IP1.1-9	Specialised dealer	1-3,5,6,8-10,12,16,18,21,22,24,32
	IP1 Key 1-11,13,15,17- partners 28,30-33,36 IP1	or value network	33,36	IP1.1-10	Service provider	1-7,9,10,12,14,17-22,26,27,30,31,33
	pururers	Or value network		IP1.1-11	Contractor	19
				IP1.1-12 IP1.1-13	User Maintenance specialist	1-7,9-14,16-25,27,29-36 3,6,14,18,21,30,33
				IP1.1-13 IP1.1-14	Maintenance specialist Collector	3,6,14,18,21,30,33 4,5,9,12,18,21,22,26,32
				IP1.1-15	Second-hand reseller	1-3,5,10,18,21,22,34
				IP1.1-16	Specialised refurbisher	1,3,10,18,21,22,33,34
				IP1.1-17	Specialised remanufacturer	1,3,21
				IP1.1-18	Specialised recovered material reseller	1,10,21,22,27
				IP1.1-19 IP2.1-1	Specialised recycler Financing	1,3-5,10,12,18-22,26,29,30,32,33,35 3,4,9,10,13,18,31
				IP2.1-2	Manufacturing materials	1,3,4,7,9,13,18,21-23,26,27,35
				IP2.1-3	Manufacturing parts	3-5,7,13,18,21,22,26,33,35
	IP2	2.1 Activities	1-11,15,17-22,25-33,36	IP2.1-4	Manufacturing (e.g., product / building component)	1,3-9,11-13,15,16,18-27,29-35
				IP2.1-5	Transporting	1,3,4,8,9,14,15,18,21,23,24,30,33
				IP2.1-6 IP2.1-7	Selling Installation / assembly	1-6,9-13,17-22,24-27,30-32,34,35 3,6,9,10,14,18,24,26
	<u> </u>			IP2.1-7	After sales support	3,9,18,31,34
				IP2.2-2	Maintenance	1-8,10,13-15,17-21,23-25,29-31,33-35
				IP2.2-3	Refilling	6,12
				IP2.2-4	De-, re-installation	3,6,13,18,33,35
				IP2.2-5	Repairing	1-7,9-11,14,16,18-27,29-36
				IP2.2-6 IP2.2-7	Refinancing Recovering or collecting	18 1,3-10,12,13,15,16,18-27,29-35
				IP2.2-8	Re-transporting	3,5,15,18,21,23,25,29,30,33
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Ε	TIP2			IP2.2-13 IP2.2-14 IP2.2-15 IP2.2-16 IP2.2-17	Reselling Dis-, reassembly (or demolition) Re- or upcycling Biodegrading (e.g., composting or anaerobic digestion) Recovering (i.e., energy recovery through combustion)	1-3,5,9,10,12,17,18,20-24,26,27,32,34,35 3-7,9,10,12,13,15,18,19,21,23-25,29-35 1-13,15-27,29-36 3,5-7,9,12,13,16,18,20,21,23-25,34,35 1,3,4,6-9,11-13,18,20-23,25,26,29,32-35
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Ε	activities 22,25-36			IP2.2-13 IP2.2-14 IP2.2-16 IP2.2-16 IP2.2-16 IP2.2-16 IP2.2-17 IP2.3-1 IP2.3-2 IP2.3-3 IP2.3-4 IP2.3-6 IP2.3-7 IP2.3-8 IP2.3-9 IP2.3-9 IP2.3-10	Reselling Dis- reassembly (or demolition) Biodegrading (e.g., composting or anaerobic digestion) Recovering (i.e., energy recovery through combustion) Monitoring, testing or informational feedback provision (Re-)casting / (re-)meiting Imaging and (re)costing (Re)moulding (Re)forming Machining (e.g., milling, sawing, drilling) Welding De-, and re-fastering Adhesive bonding Crushing / shredding Anaerobic digestion and biochemical extraction	1-3.5.9.10.12.17.18.20-24.26.27.32.34.35 3-7.9.10.12.13.15.18.19.21.23-25.29-35 1-13.15.27.29.38 3.5-7.9.12.13.16.18.20.21.23-25.34.35 1.3.4.6.9.11-13.18.20-23.25.26.29.32-35 1.3.4.6.7.9.10.12-14.17.18.20-22.24.26.28.30.31.33-35 3.5.6.33
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Ε	activities 22,25-36			IP2.2-13 IP2.2-14 IP2.2-15 IP2.2-16 IP2.2-16 IP2.2-17 IP2.3-1 IP2.3-2 IP2.3-3 IP2.3-3 IP2.3-6 IP2.3-7 IP2.3-8 IP2.3-9 IP2.3-1 IP2.3-1 IP2.3-1 IP3.1-1 IP3.1-1	Reselling Dis- reassembly (or demolition) Re- or upcycling Biodegrading (e.g., composting or anaerobic digestion) Recovering (i.e., energy recovery through combustion) Monitoring, testing or informational feedback provision (Re-)casting / (re-)melting Imaging and (re)coating (Re)moulding (Re)moulding (Re)moulding Machining (e.g., milling, sawing, drilling) Welding De-, and re-fastening Adhesive bonding Crushing / shredding Anaerobic digestion and biochemical extraction Additive manufacturing - 3D printing Mine	1-3.5.9.10.12.17.18.20-24.26.27.32.34.35 3-7.9.10.12.13.15.18.19.21.23-25.29-35 1-13.15-27.29-38 3.5-7.9.12.13.16.18.20.21.23-25.34.35 1.3.4.6.9.11-13.18.20-23.25.26.29.32-25 1.3.4.6.9.11-13.18.20-23.25.26.29.32-25 1.3.4.6.9.31-31.38.20-31.23-25.24.26.28.39.31.33-35 3.5.6.33 3.4.9.18.22.32.34 7.18.21 3.7.11.12.15.20.21.23.34
Ε	activities 22,25-36			IP2.2-13 IP2.2-14 IP2.2-16 IP2.2-16 IP2.2-17 IP2.2-18 IP2.3-18 IP2.3-2 IP2.3-3 IP2.3-4 IP2.3-5 IP2.3-6 IP2.3-8 IP2.3-9 IP2.3-9 IP2.3-10 IP2.3-11	Reselling Dis- reassembly (or demolition) Biodegrading (e.g., composting or anaerobic digestion) Biodegrading (e.g., composting or anaerobic digestion) Recovering (i.e., energy recovery through combustion) Monitoring, testing or informational feedback provision (Re-)casting / (re-)melting Imaging and (re)costing (Re)moulding (Re	1-3.5.9.10.12.17,18.20-24.26,27.32,34.35 3-7.9.10.12.13.15.18.19.21.23-25.29-35 1-13.15-27,29-36 3.6-7.9.12.13.16.18.20.21.23-25.34.35 1.3.4.6.9.11-13.18.20-23.25.26.29.32-25 1.3.4.6.9.11-13.18.20-23.25.26.29.32-25 3.3.5.6.33 23.33 3.4.9.18.22.32.34 7.18.21 3.7.11.12.15.20.21.23.34
Ε	activities 22,25-36			IP2.2-13 IP2.2-14 IP2.2-14 IP2.2-16 IP2.2-16 IP2.2-17 IP2.2-18 IP2.3-1 IP2.3-3 IP2.3-3 IP2.3-4 IP2.3-5 IP2.3-6 IP2.3-7 IP2.3-8 IP2.3-9 IP2.3-11 IP3.1-1 IP3.1-1 IP3.1-1 IP3.1-1 IP3.1-1 IP3.1-2 IP3.1-3 IP3.1-4	Reselling Dis- reassembly (or demolition) Re- or upcycling Biodegrading (e.g., composting or anaerobic digestion) Recovering (i.e., energy recovery through combustion) Monitoring, testing or informational feedback provision (Re-)casting / (re-)melting Imaging and (re)coating (Re)costing / (re-)melting Imaging and (re)coating (Re)forming Meloring (Re)forming Meloring De., and re-fastening Adhesive bonding Crushing / shredding Crushing / shredding Mine Factory or production facility Warehouse (Re)distribution centre (Re)distribution centre	1-3.5.9.10.12.17.18.20-24.26.27.32.34.35 3-7.9.10.12.13.15.18.19.21.23-25.29-35 1-13.15.29.39 3.5-7.9.12.13.16.18.20.21.23-25.34.35 1.3.4.6.9.11-13.18.20-23.25.26.29.32-35 1.3.4.6.9.11-13.18.20-23.25.26.29.32-35 3.5.6.33
Ε	activities 22,25-36			IP2.2-13 IP2.2-14 IP2.2-14 IP2.2-15 IP2.2-16 IP2.2-17 IP2.2-18 IP2.3-1 IP2.3-3 IP2.3-3 IP2.3-4 IP2.3-5 IP2.3-6 IP2.3-7 IP2.3-8 IP2.3-9 IP2.3-10 IP3.1-1 IP3.1-2 IP3.1-3 IP3.1-3 IP3.1-4 IP3.1-5	Reselling Dis- reasombly (or demolition) Re-or upcycling Biodegrading (e.g., composting or anaerobic digestion) Recovering (i.e., energy recovery through combustion) Monitoring, testing or informational feedback provision (Re-)casting / (re-)melting Imaging and (re)costing (Re)conting (Re)forming Machining (e.g., milling, sawing, drilling) Welding De-, and re-fastening Adhesive bonding Crushing / shredding Anaerobic digestion and biochemical extraction Additive manufacturing - 3D printing Mine Factory or production facility Warehouse (Re)distribution centre Digital platform	1-3.5.9.10.12.17.18.20-24.26.27.32.34.35 3-7.9.10.12.13.15.18.19.21.23-25.29-35 1-13.15.27.29.38 3.5-7.9.12.13.16.18.20.21.23-25.34.35 1.3.4.6.9.11-13.18.20-23.25.26.29.32-35 1.3.4.6.9.11-13.18.20-23.25.26.29.32-35 3.5.5.33 23.33 3.4.9.18.22.32.34 7.18.21 1.4.6.9-11.15.31.32 4 1.3.5.6.9-12.18-22.26.27.31,32.34
Ε	activities 22,25-36			IP2.2-13 IP2.2-14 IP2.2-14 IP2.2-15 IP2.2-16 IP2.2-17 IP2.2-17 IP2.2-18 IP2.3-2 IP2.3-3 IP2.3-4 IP2.3-6 IP2.3-6 IP2.3-7 IP2.3-9 IP2.3-10 IP2.3-11 IP3.1-1 IP3.1-2 IP3.1-3 IP3.1-3 IP3.1-4 IP3.1-6 IP3.1-6	Reselling Dis- reassembly (or demolition) Re-or upcycling Biodegrading (e.g., composting or anaerobic digestion) Recovering (i.e., energy recovery through combustion) Monitoring, testing or informational feedback provision (Re-)casting / (re-)melting Imaging and (re)coating (Re)conting (Re)orning (Re)orning Machining (e.g., milling, sawing, drilling) Welding De-, and re-fastening Adheave bonding Crushing / shredding Anaerobic digestion and biochemical extraction Additive manufacturing - 3D printing Mine Factory or production facility Warehouse (Re)distribution centre Digital platform Shop	1-3.5.9.10.12.17,18.20-24.26.27.32.34.35 3-7.9.10.12.13.15.18.19.21.23-25.29-35 1-13.16-27.93-8 3.5-7.9.12.13.16.18.20.21.23-25.34.35 1.3.4.6-9.11-13.18.20-22.25.26.29.32-25 1.3.4.6-9.11-13.18.20-22.24.26.28.30.31.33-35 3.5.6.33 3.4.9.18.22.32.34 7.18.21 3.7.11.12.15.20.21.23.34 1 1.4.6-9.11.15.31.32 4 1.3.5.6.9-12.18-22.26.27.31,32.34 3.5.9.10.12.16.18.21.22.24.31.35
Ε	activities 22,25-36	per (re)activity		IP2.2-13 IP2.2-14 IP2.2-15 IP2.2-16 IP2.2-17 IP2.2-17 IP2.2-17 IP2.3-2 IP2.3-3 IP2.3-5 IP2.3-6 IP2.3-6 IP2.3-8 IP2.3-9 IP2.3-10 IP2.3-11 IP3.1-1 IP3.1-1 IP3.1-1 IP3.1-2 IP3.1-4 IP3.1-5 IP3.1-6 IP3.1-7	Reselling Dis. reassembly (or demolition) Dis. reassembly (or demolition) Recovering (i.e., composting or anaerobic digestion) Recovering (i.e., energy recovery through combustion) Monitoring, testing or informational feedback provision (Re-)casting / (re-)melting Imaging and (re)coating (Re)costing / (re-)melting Imaging and (re)coating (Re)forming Maching (e.g., milling, sawing, drilling) Welding De., and re-fastening Adhesive bonding Crushing / shredding Crushing / shredding Anaerobic digestion and biochemical extraction Additive manufacturing - 3D printing Mine Factory or production facility Warehouse (Re)distribution centre Digital platform Shop (Re)makerspace	1-3.5.9.10.12.17.18.20-24.26.27.32.34.35 3-7.9.10.12.13.15.18.19.21.23-25.29-35 1-13.16.92.23.23 3.5-7.9.12.13.16.18.20.21.23-25.34.35 1.3.4.6.9.11-13.18.20-23.25.26.29.32-35 1.3.4.6.9.11-13.18.20-23.25.26.29.32-35 3.5.6.33 23.33 23.33 3.4.9.18.22.32.34 7.18.21 3.7.11.12.15.20.21.23.34 1 1.4.4.9.+11.15.31.32 4 1.3.5.6.9.12.18-22.26.27.31,32.34 3.5.9.10.12.16.18.21.22.24.31.35
Ε	activities 22,25-36	per (re)activity	20-25,27,29,31-34,36	IP2.2-13 IP2.2-14 IP2.2-14 IP2.2-15 IP2.2-16 IP2.2-17 IP2.2-17 IP2.2-18 IP2.3-2 IP2.3-3 IP2.3-4 IP2.3-6 IP2.3-6 IP2.3-7 IP2.3-9 IP2.3-10 IP2.3-11 IP3.1-1 IP3.1-2 IP3.1-3 IP3.1-3 IP3.1-4 IP3.1-6 IP3.1-6	Reselling Dis- reassembly (or demolition) Biodegrading (e.g., composting or anaerobic digestion) Biodegrading (e.g., composting or anaerobic digestion) Recovering (i.e., energy recovery through combustion) Monitoring, testing or informational feedback provision (Re-)casting / (re-)melting Imaging and (re)coating (Re)moulding (Re)forming Machining (e.g., milling, sawing, drilling) Welding De-, and re-fastening Adheabve bonding Crushing / shredding Anaerobic digestion and biochemical extraction Additive manufacturing - 3D printing Mine Factory or production facility Warehouse (Re)distribution centre Digital platform Shop	1-3.5.9.10.12.17,18.20-24.26.27.32.34.35 3-7.9.10.12.13.15.18.19.21.23-25.29-35 1-13.16-27.93-8 3.5-7.9.12.13.16.18.20.21.23-25.34.35 1.3.4.6-9.11-13.18.20-22.25.26.29.32-25 1.3.4.6-9.11-13.18.20-22.24.26.28.30.31.33-35 3.5.6.33 3.4.9.18.22.32.34 7.18.21 3.7.11.12.15.20.21.23.34 1 1.4.6-9.11.15.31.32 4 1.3.5.6.9-12.18-22.26.27.31,32.34 3.5.9.10.12.16.18.21.22.24.31.35
Ε	activities 22,25-36	per (re)activity	20-25,27,29,31-34,36	IP2.2-13 IP2.2-14 IP2.2-15 IP2.2-15 IP2.2-16 IP2.2-17 IP2.2-17 IP2.2-17 IP2.3-2 IP2.3-3 IP2.3-3 IP2.3-6 IP2.3-7 IP2.3-8 IP2.3-9 IP2.3-10 IP2.3-10 IP3.1-1 IP3.1-2 IP3.1-3 IP3.1-3 IP3.1-6 IP3.1-6 IP3.1-7 IP3.1-7 IP3.1-8	Reselling Dis- reassembly (or demolition) Re-or upcycling Biodegrading (e.g., composting or anaerobic digestion) Recovering (i.e., energy recovery through combustion) Recovering (i.e., energy recovery through combustion) (Re-)casting / (re-)melting Imaging and (re)costing (Re)casting / (re-)melting Imaging and (re)costing (Re)forming Machining (e.g., milling, sawing, drilling) Weelding De-, and re-fastening Adhesive bonding Crushing / shredding Anaerobic digestion and biochemical extraction Additive manufacturing - 3D printing Mine Factory or production facility Warehouse (Re)distribution centre Digital platform Shop Ingentic Research	1-3.5.9.10.12.17.18.20-24.26.27.32.34.35 3-7.9.10.12.13.15.18.19.21.23-25.29-35 3-5.7.9.12.13.16.18.20.21.23-25.29-35 3.5-7.9.12.13.16.18.20.21.23-25.34.35 1.3.4.6.9.11-13.18.20-23.25.26.29.32-35 3.5.6.33 23.33 23.33 3.4.9.18.22.32.34 7.18.21 3.7.11.21.52.02.12.3.34 1 1.4.4.911.15.31.32 4 1.3.5.6.9.12.18-22.26.27.31.32.34 3.5.9.10.12.16.18.21.22.24.31.35
Ε	IP2 activities 22.25-36	per (re)activity	20-25,27,29,31-34,36	IP2.2-13 IP2.2-14 IP2.2-15 IP2.2-16 IP2.2-16 IP2.2-17 IP2.3-1 IP2.3-3 IP2.3-3 IP2.3-3 IP2.3-4 IP2.3-5 IP2.3-7 IP2.3-8 IP2.3-9 IP2.3-10 IP2.3-11 IP3.1-1 IP3.1	Reselling Dis- reassembly (or demolition) Re-or upcycling Biodegrading (e.g., composting or anaerobic digestion) Recovering (i.e., energy recovery through combustion) Recovering (i.e., energy recovery through combustion) (Re-)casting / (re-)melting Imaging and (re)costing (Re)casting / (re-)melting Imaging and (re)costing (Re)forming Machining (e.g., milling, sawing, drilling) Welding De-, and re-fastening Adhesive bonding Crushing / shredding Anaerobic digestion and biochemical extraction Additive manufacturing - 3D printing Mine Factory or production facility Warehouse (Re)distribution centre Digital platform Shop Greyman end shop Repair café or repair shop	1-3.5.9.10.12.17,18.20-24.26.27.32.34.35 3-7.9.10.12.13.15.18.19.21.23-25.29-35 1-13.16.27.29-38 3.5-7.9.12.13.16.18.20.21.23-25.34.35 1.3.4.6.9.11-13.18.20-22.25.26.29.32-25 1.3.4.6.9.11-13.18.20-22.24.26.28.30.31.33-35 3.5.6.33 3.4.9.18.22.32.34 7.18.21 3.7.11.12.15.20.21.23.34 1 1.3.6.9.11.15.31.32 4 1.3.5.6.9-12.18-22.26.27.31.32.34 3.5.9.10.12.16.18.21.22.24.31.35 11 1.3.6.9.11.21.23.30.32
Ε	IP2 activities 22,25-36 IP2 IP3 Key 2,3,5,6,17- 1P3	per (re)activity	20-25,27,29,31-34,36	IP2.2-13 IP2.2-14 IP2.2-16 IP2.2-16 IP2.2-17 IP2.2-17 IP2.2-18 IP2.3-1 IP2.3-2 IP2.3-3 IP2.3-4 IP2.3-5 IP2.3-6 IP2.3-7 IP2.3-8 IP2.3-9 IP2.3-11 IP3.1-1	Reselling Dis- reasembly (or demolition) Re-or upcycling Biodegrading (e.g., composting or anaerobic digestion) Recovering (i.e., energy recovery through combustion) Monitoring, testing or informational feedback provision (Re-)casting / (re-)melting Imaging and (re)coating (Re)forming Machining (e.g., milling), sawing, drilling) Welding De-, and re-fastening Adhesive bonding Crusher's or deficient of the desired of the des	1-3.5.9.10.12.17,18.20-24.26.27.32.34.35 3-7.9.10.12.13.15.18.19.21.23-25.29-35 1-13.16.29.29.38 3.5-7.9.12.13.16.18.20.21.23-25.34.35 1.3.4.6-9.11-13.18.20-22.25.26.29.32-25 1.3.4.6-9.11-13.18.20-22.24.26.28.30.31.33-35 3.5.6.33 3.4.9.18.22.32.34 7.18.21 3.7.11.12.15.20.21.23.34 1 1.3.6.9.11.15.31.32 4 1.3.5.6.9-12.18-22.26.27.31.32.34 3.5.9.10.12.16.18.21.22.24.31.35 11 1.3.6.9.11.21.23.30.32 5.23 3.5.21.31
Ε	IP2 activities 22.25-36 IP2	per (re)activity	20-25,27,29,31-34,36	IP2.2-13 IP2.2-14 IP2.2-16 IP2.2-16 IP2.2-16 IP2.2-17 IP2.3-1 IP2.3-2 IP2.3-3 IP2.3-3 IP2.3-4 IP2.3-5 IP2.3-6 IP2.3-7 IP2.3-8 IP2.3-7 IP2.3-8 IP2.3-10 IP3.1-1 IP3.1-1 IP3.1-2 IP3.1-3 IP3.1-3 IP3.1-6 IP3.1-7 IP3.1-8 IP3.1-1	Reselling Dis- reassembly (or demolition) Dis- reassembly (or demolition) Recovering (i.e., composting or anaerobic digestion) Recovering (i.e., energy recovery through combustion) Recovering (i.e., energy recovery through combustion) (Re-)casting / (re-)melting Imaging and (re)coating (Re)casting / (re-)melting Imaging and (re)coating (Re)forming Maching (e.g., milling, sawing, drilling) Welding De-, and re-fastening Adhesive bonding Crushing / shredding Crushing / shredding Anaerobic digestion and biochemical extraction Additive manufacturing - 3D printing Mine Factory or production facility Warehouse (Re)distribution centre Digital platform Shop (Re)makerspace Home or site of user (Re)sorting centre Second-hand shop Repair castio or repair shop Return street Re-factory	1-3.5.9.10.12.17.18.20-24.26.27.32.34.35 3-7.9.10.12.13.15.18.19.21.23-25.29-35 1-13.16.92.23.23 3.5-7.9.12.13.16.18.20.21.23-25.34.35 1.3.4.6.9.11-13.18.20-23.25.26.29.32-35 1.3.4.6.9.11-13.18.20-23.25.26.29.32-35 3.5.6.33 23.33 23.33 3.4.9.18.22.32.34 7.18.21 3.7.11.21.52.02.12.334 1 1.4.4.911.15.31.32 4 1.3.5.6.9.12.18-22.26.27.31,32.34 3.5.9.10.12.16.18.21.22.24.31.35
Ε	IP2 activities 22.25-36 IP2 IP3 Key 2.3.5.6.17- 22.25-28.30-	per (re)activity	20-25,27,29,31-34,36	IP2.2-13 IP2.2-14 IP2.2-15 IP2.2-16 IP2.2-16 IP2.2-17 IP2.2-18 IP2.3-1 IP2.3-3 IP2.3-3 IP2.3-4 IP2.3-5 IP2.3-8 IP2.3-7 IP2.3-8 IP2.3-7 IP2.3-8 IP2.3-10 IP2.3-11 IP3.1-1 IP3.1	Reselling Dis- reassembly (or demolition) Re-or upcycling Biodegrading (e.g., composting or anaerobic digestion) Recovering (i.e., energy recovery through combustion) Recovering (i.e., energy recovery through combustion) Recovering (i.e., energy recovery through combustion) (Re-)casting / (re-)melting Imaging and (re)costing (Re)combing Replomating (Re)forming Machining (e.g., milling, sawing, drilling) Welding De-, and re-fastening Adhesive bonding Crushing / shredding Anaerobic digestion and biochemical extraction Additive manufacturing - 3D printing Mine Factory or production facility Warehouse (Re)distribution centre Digital platform Shop (Re)misserspace Home or site of user (Re-)arching entre Second-hand shop Repair café or repair shop Return street Re-lactory (Re-)print shop	1-3.5.9.10.12.17.18.20-24.26.27.32.34.35 3-7.9.10.12.13.15.18.19.21.23-25.29-35 1-13.15-27.29.36 3.5-7.9.12.13.16.18.20.21.23-25.34.35 1.3.4.6.9.11-13.18.20-22.25.26.29.32-35 1.3.4.6.9.11-13.18.20-22.24.26.28.30.31.33-35 3.5.6.33 23.33 3.4.9.18.22.32.34 7.18.21 1.4.4.9.11.12.15.20.21.23.34 1.1.4.6.9-11.15.31.32 4 1.3.5.6.9-12.18-22.26.27.31,32.34 3.5.9.10.12.16.18.21.22.24.31.35 11 1.3.6.9.11.21.23.30.32 5.23 3.5.21.31
Ε	IP2 activities 22.25-36 IP2 IP3 Key 2.3.5.6.17- 22.25-28.30-	per (re)activity	20-25,27,29,31-34,36	IP2.2-13 IP2.2-14 IP2.2-16 IP2.2-16 IP2.2-16 IP2.2-17 IP2.3-1 IP2.3-2 IP2.3-3 IP2.3-3 IP2.3-4 IP2.3-5 IP2.3-6 IP2.3-7 IP2.3-8 IP2.3-7 IP2.3-8 IP2.3-10 IP3.1-1 IP3.1-1 IP3.1-2 IP3.1-3 IP3.1-3 IP3.1-6 IP3.1-7 IP3.1-8 IP3.1-1	Reselling Dis- reassembly (or demolition) Dis- reassembly (or demolition) Recovering (i.e., composting or anaerobic digestion) Recovering (i.e., energy recovery through combustion) Recovering (i.e., energy recovery through combustion) (Re-)casting / (re-)melting Imaging and (re)coating (Re)casting / (re-)melting Imaging and (re)coating (Re)forming Maching (e.g., milling, sawing, drilling) Welding De-, and re-fastening Adhesive bonding Crushing / shredding Crushing / shredding Anaerobic digestion and biochemical extraction Additive manufacturing - 3D printing Mine Factory or production facility Warehouse (Re)distribution centre Digital platform Shop (Re)makerspace Home or site of user (Re)sorting centre Second-hand shop Repair castio or repair shop Return street Re-factory	1-3.5.9.10.12.17,18.20-24.26.27.32.34.35 3-7.9.10.12.13.15.18.19.21.23-25.29-35 1-13.16.29.29.38 3.5-7.9.12.13.16.18.20.21.23-25.34.35 1.3.4.6-9.11-13.18.20-22.25.26.29.32-25 1.3.4.6-9.11-13.18.20-22.24.26.28.30.31.33-35 3.5.6.33 3.4.9.18.22.32.34 7.18.21 3.7.11.12.15.20.21.23.34 1 1.3.6.9.11.15.31.32 4 1.3.5.6.9-12.18-22.26.27.31.32.34 3.5.9.10.12.16.18.21.22.24.31.35 11 1.3.6.9.11.21.23.30.32 5.23 3.5.21.31
Ε	IP2 activities 22.25-36 IP2 IP3 Key 2.3.5.6.17- 22.25-28.30-	per (re)activity	20-25,27,29,31-34,36	IP2.2-13 IP2.2-14 IP2.2-14 IP2.2-16 IP2.2-16 IP2.2-17 IP2.2-17 IP2.3-1 IP2.3-2 IP2.3-3 IP2.3-4 IP2.3-5 IP2.3-6 IP2.3-7 IP2.3-8 IP2.3-9 IP2.3-9 IP2.3-11 IP3.1-1 IP3.1-	Reselling Dis- reassembly (or demolition) Dis- reassembly (or demolition) Biodegrading (e.g., composting or anaerobic digestion) Recovering (i.e., energy recovery through combustion) Monitoring, testing or informational feedback provision (Re-)casting / (re-)melting Imaging and (re)coating (Re)jorning Machining (e.g., milling, sawing, drilling) Welding De-, and re-fastering Adhesive bonding Crushing / shredding Adhesive bonding Crushing / shredding Adhesive bonding Crushing - 3D printing Mine Factory or production facility Warehouse (Re)distribution centre Digital platform Shop Greynamerspace Home or site of user (Re-)scring centre Second-hand shop Respair cafe or repair shop Return street Re-factory (Re-)print shop Recycling facility	1-3.5.9.10.12.17.18.20-24.26.27.32.34.35 3-7.9.10.12.13.15.18.19.21.23-25.29-35 1-13.15-27.29.36 3.5-7.9.12.13.16.18.20.21.23-25.34.35 1.3.4.6.9.11-13.18.20-23.25.26.29.32-35 1.3.4.6.9.11-13.18.20-23.25.26.29.32-35 3.5.5.33 3.4.9.18.22.32.34 7.18.21 3.4.9.18.22.32.34 7.18.21 1.4.4.9.11.12.15.20.21.23.34 1.1.4.6.9-11.15.31.32 4 1.3.5.6.9-12.18-22.26.27.31.32.34 3.5.9.10.12.16.18.21.22.24.31.35 11 1.3.6.9.11.21.23.30.32 5.23 3.5.21.31
Ε	IP2 activities 22.25-36 IP2 IP3 Key 2.3.5.6.17- 22.25-28.30-	per (re)activity	20-25,27,29,31-34,36	IP2.2-13 IP2.2-14 IP2.2-14 IP2.2-16 IP2.2-16 IP2.2-17 IP2.2-18 IP2.3-1 IP2.3-2 IP2.3-3 IP2.3-4 IP2.3-5 IP2.3-6 IP2.3-7 IP2.3-8 IP2.3-9 IP2.3-9 IP2.3-1 IP3.1-1	Reselling Dis- reassembly (or demolition) Dis- reassembly (or demolition) Biodegrading (e.g., composting or anaerobic digestion) Recovering (i.e., energy recovery through combustion) Monitoring, testing or informational feedback provision (Re-)casting / (re-)melting Imaging and (re)coating (Re)doming Machining (e.g., milling), sawing, drilling) Welding De-, and re-fastering Adhesive bonding Crushing / shredding Adhesive bonding Crushing / shredding Adhesive bonding Crushing - 3D printing Mine Factory or production facility Warehouse (Re)distribution centre Digital platform Shop Greynames of the distribution of the service of the	1-3.5.9.10.12.17,18.20-24.26.27.32.34.35 3-7.9.10.12.13.15.18.19.21.23-25.29-35 1-13.16.29.38 3.5-7.9.12.13.16.18.20.21.23-25.34.35 1.3.4.6.9.11-13.18.20-23.25.26.29.32-25 1.3.4.6.9.11-13.18.20-23.25.26.29.32-25 3.5.5.33 3.4.9.18.22.32.34 3.4.9.18.22.32.34 7.18.21 3.7.11.12.15.20.21.23.34 1 1.4.6.9-11.15.31.32 4 1.3.5.6.9-12.18-22.26.27.31,32.34 3.5.9.10.12.16.18.21.22.24.31.35 11 1.3.6.9.11.21.23.30.32 5.23 3.5.21.31 32 1-3.5.6.9.12.32 7.13.19 3.7.13.19.20.32
Ε	IP2 activities 22.25-36 IP2 IP3 Key 2.3.5.6.17- 22.25-28.30-	per (re)activity	20-25,27,29,31-34,36 1,3-6,10- 12,15,20,27,32,33	IP2.2-13 IP2.2-14 IP2.2-16 IP2.2-16 IP2.2-16 IP2.2-17 IP2.2-17 IP2.3-1 IP2.3-2 IP2.3-3 IP2.3-4 IP2.3-5 IP2.3-6 IP2.3-7 IP2.3-8 IP2.3-7 IP2.3-8 IP2.3-10 IP2.3-11 IP3.1-1 IP3.1-1 IP3.1-1 IP3.1-2 IP3.1-3 IP3.1-1 IP3.1	Reselling Dis. reassembly (or demolition) Dis. reassembly (or demolition) Recovering (i.e., composting or anaerobic digestion) Recovering (i.e., energy recovery through combustion) Recovering (i.e., energy recovery through combustion) (Re-)casting / (re-)melting Imaging and (re)coating (Re)coating / (re-)melting Imaging and (re)coating (Re)forming Machining (e.g., milling, sawing, drilling) Weeling De. and re-fastening Adhesive bonding Crushing / shredding Adhesive bonding Crushing / shredding Adhesive bonding Adhesive bonding Crushing / shredding Crushing / s	1-3.5.9.10.12.17.18.20-24.26.27.32.34.35 3-7.9.10.12.13.15.18.19.21.23-25.29-35 1-13.16.92.29.36 3.5-7.9.12.13.16.18.20.21.23-25.34.35 1.3.4.6.9.11-13.18.20-23.25.26.29.32-35 1.3.4.6.9.11-13.18.20-23.25.26.29.32-35 3.5.6.33 23.33 23.33 23.33 24.9.18.22.32.34 7.18.21 3.7.11.12.15.20.21.23.34 1 1.4.4.911.15.31.32 4 1.3.5.6.9.12.18-22.26.27.31.32.34 3.5.9.10.12.16.18.21.22.24.31.35 11 1.3.6.9.11.21.23.30.32 5.23 3.5.21.31 32 1-3.5.6.9.12.32 7.13.19.20.32 7.13.19.20.32
Ε	IP2 activities 22.25-36 IP2 IP3 Key 2.3.5.6.17- 22.25-28.30-	per (re)activity	20-25,27,29,31-34,36	IP2.2-13 IP2.2-14 IP2.2-15 IP2.2-16 IP2.2-16 IP2.2-17 IP2.3-1 IP2.3-3 IP2.3-3 IP2.3-3 IP2.3-4 IP2.3-3 IP2.3-4 IP2.3-5 IP2.3-7 IP2.3-8 IP2.3-7 IP2.3-8 IP2.3-10 IP2.3-11 IP3.1-1 IP3.2-2 IP3.2-3 IP3.2-4	Reselling Dis. reassembly (or demolition) Dis. reassembly (or demolition) Recovering (i.e., composting or anaerobic digestion) Recovering (i.e., energy recovery through combustion) Recovering (i.e., energy recovery through combustion) (Re-)casting / (re-)melting Imaging and (re)costing (Re)casting / (re-)melting Imaging and (re)costing (Re)forming Machining (e.g., milling, sawing, drilling) Welding De., and re-fastening Adhesive bonding Creating / shredding Anaerobic digestion and biochemical extraction Additive manufacturing - 3D printing Mine Factory or production facility Warehouse (Re)distribution centre Digital platform Shop Greyman experiment of user Responding entry Responding entry Responding entry Responding facility Responding Responding facility Responding Responding facility Responding	1-3.5.9.10.12.17.18.20-24.26.27.32.34.35 3-7.9.10.12.13.15.18.19.21.23-25.29-35 1-13.15-27.29.36 3.5-7.9.12.13.16.18.20.21.23-25.34.35 1.3.4.6.9.11-13.18.20-23.25.26.29.32-25 1.3.4.6.9.11-13.18.20-23.25.26.29.32-25 3.5.5.33 23.33 23.33 23.33 24.39.18.22.32.34 7.18.21 1.4.4.9.11.12.15.20.21.23.34 1.1.14.6.9-11.15.31.32 4 1.3.5.6.9-12.18-22.26.27.31.32.34 3.5.9.10.12.16.18.21.22.24.31.35 11 1.3.6.9.11.21.23.30.32 5.23 3.5.21.31 32 1-3.5.6.9.12.32 7.13.19 3.7.13.19.20.32 7.13.19.20.32 1-7.9.36
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Ε	IP2 activities 22,25-36 IP2 IP3 Key 2,3,5,6,17-22,26,28,30-22,26,28,30-33,36	per (re)activity	20-25,27,29,31-34,36 1,3-6,10- 12,15,20,27,32,33 2,3,6,12,18,	IP2.2-13 IP2.2-14 IP2.2-16 IP2.2-16 IP2.2-17 IP2.2-16 IP2.2-17 IP2.3-1 IP2.3-3 IP2.3-3 IP2.3-4 IP2.3-5 IP2.3-6 IP2.3-7 IP2.3-8 IP2.3-7 IP2.3-8 IP2.3-10 IP2.3-11 IP3.1-1 IP3.1	Reselling Dis- reassembly (or demolition) Dis- reassembly (or demolition) Biodegrading (e.g., composting or anaerobic digestion) Recovering (i.e., energy recovery through combustion) Monitoring, testing or informational feedback provision (Re-)casting / (re-)melting Imaging and (re)costing (Re)glorming Machining (e.g. milling, sawing, drilling) Weldring De., and re-fastening Adhesive bonding Crushing / shredding Anaerobic digestion and biochemical extraction Additive manufacturing - 3D printing Mine Factory or production facility Warehouse (Re)distribution centre Digital platform Shop (Re)makerspace Home or site of user (Re-)sorting centre Second-hand shop Repair cafe or repair shop Return street Re-factory (Re-)print shop Recycling facility Urban mine Building Building component Product (Sub-)component Part Material Resource	1-3.5.9.10.12.17.18.20-24.26.27.32.34.35 3-7.9.10.12.13.15.18.19.21.23-25.29-35 1-13.16.29.29.38 3.5-7.9.12.13.16.18.20.21.23-25.34.35 1.3.4.6.9.11-13.18.20-23.25.26.29.32-25 1.3.4.6.9.11-13.18.20-23.25.26.29.32-25 3.3.33 3.4.9.18.22.32.34 7.18.21 3.7.11.12.15.20.21.23.34 1.4.6.9-11.15.31.32 4. 1.3.5.6.9-12.18-22.26.27.31,32.34 3.5.9.10.12.16.18.21.22.24.31.35 11 1.3.6.9.11.21.23.30.32 5.23 3.5.21.31 32 1-3.5.6.9.12.32 7.13.19.20.32 7.13.19.20.32 7.13.19.20.32 7.13.19.20.32 7.13.19.20.32 7.13.19.20.32 7.13.19.20.32 1.3-7.9.12-15.18.20.22.24.26.27.29.33-35 1.3-7.9.12-15.18.20.22.24.26.27.29.33-35 1.3-7.9.12-15.18.20.22.24.26.27.29.33-35 1.3-8.11.21.13.15.34.36

				IP4.1	Mode of transport	3,6,7,15,21,23,30	IP4.1-4	Freight ship	3,21,32
			2-				IP4.1-5 IP4.1-6	Freight train Bike	
	l	Transport /					IP4.1-6	Bulky transport	
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			31,33,35				IP4.2-1	At home / on site (i.e., ± 0 km)	1,9,15,18,19,23,30
						3-7,9,11-13,15,18-	IP4.2-2 IP4.2-3	Local (i.e., city ± 20 km) Regional (i.e., ± 50 km)	1,4,-7,9,11-13,15,18,19,21,25,30,35
<u>e</u>				IP4.2	Distance	21,23,27,29,30,33,35	IP4.2-4	National (i.e., ± 200-300 km)	12,18,33
Industrial mode							IP4.2-5	Continental (i.e., ± 300-2000 km)	32
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ial							IP5.1-1 IP5.1-2	Natural gas Grey power (i.e., electricity from fossil resources)	18,30
stı							IP5.1-3	Diesel / petrol	18,21,30
ㅁ							IP5.1-4	Bio gas / biofuel	9,21
프		Process	3-7,9,15,16,18-			3,6,7,15,16,18-	IP5.1-5 IP5.1-6	Hydrogen power Green alternating current (e.g., transformed electricity from PV-cells)	30
	IP5	energy	25,27,29,30, 32,33,36	IP5.1	Type of energy	23,27,29,30,33,36	IP5.1-7	Green direct current (e.g., electricity from PV-cells)	18
			32,33,30				IP5.1-8	Heat from thermal storage	18
							IP5.1-9 IP5.1-10	On-site pre-heating (e.g., horizontal ground loop) Industrial symbiosis	21
							IP5.1-11	Off-site power (i.e., grid energy)	18,30
							IP5.1-12	On-site power (i.e., independent generated power)	18,36
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							BP1.1-2 BP1.1-3	Building owner Expert (e.g., designers, consultants)	13,19 1-3,6,8,11,13,15-19,21,24-26,31-33
							BP1.1-4	Third-party financier	2,6,10,13,18,31,32
							BP1.1-5 BP1.1-6	Material supplier	1-3,6,17-22,26-28,32,33 2,3,5,7,9,14,15,17-22,28,33
							BP1.1-7	Part supplier Manufacturer (e.g., product or building component manufacturer)	1-7,9,10,12-18,20-22,24,26-28,30-34
							BP1.1-8	Transporter	2,4,5,8,18,21,26
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		partners	28,30-33,36		or value network	33,36	BP1.1-11	Contractor	19
							BP1.1-12 BP1.1-13	User Maintenance specialist	1-7,9-14,16-25,27,29-36 3,6,14,18,21,30,33
							BP1.1-14	Collector	4,5,9,12,18,21,22,26,32
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			2,3,6,17,18,20-			1-7,10,11,13,17-27,30-	BP2.1-4	Specialised dealer as owner	18
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				BP3.2	Kind of customer	1-3,6,9,11,17-	BP3.2-1 BP3.2-2	Dedicated personal assistance Mixed human and auto. interaction (e.g., help-desk and online website)	9,17,26,31 31
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		relations		BP3.4	Kind of collaboration		BP3.4-3 BP3.4-4	Strategic alliance between (non-competing) partners Industry association	1,7,8,10,12,17,21,27,31,32 8
		relations		BP3.4	Kind of collaboration		BP3.4-3 BP3.4-4 BP3.4-5	Strategic alliance between (non-competing) partners Industry association Co-creation	1,7,8,10,12,17,21,27,31,32 8 2,3,6,10,11,16-22,28,31,32
-	DD4	Cost	2.3,6,8,17,18,			27-29,31,32,34	BP3.4-3 BP3.4-4 BP3.4-5 BP3.4-6 BP3.4-7 BP3.4-8 BP4.1-1	Strategic alliance between (non-competing) partners Industry association Co-creation Competition Building team Joint venture Cost driven (i.e., low cost to manufacture and install)	1,7,8,10,12,17,21,27,31,32 8 2,3,6,10,11,16-22,28,31,32 31 19 6,10,18,31 3,4,18
labo	BP4		2,3,6,8,17,18, 20,22,26- 31,34,36		Kind of collaboration Cost proposition		BP3.4-3 BP3.4-4 BP3.4-5 BP3.4-6 BP3.4-7 BP3.4-8	Strategic alliance between (non-competing) partners Industry association Co-creation Competition Building team Joint venture	1,7,8,10,12,17,21,27,31,32 8 2,3,6,10,11,16-22,28,31,32 31 19 6,10,18,31
model	BP4	Cost	20,22,26-			27-29,31,32,34	BP3.4-3 BP3.4-4 BP3.4-5 BP3.4-6 BP3.4-7 BP3.4-8 BP4.1-1 BP4.1-2 BP4.1-3 BP5.1-1	Strategic alliance between (non-competing) partners industry association Co-creation Conpetition Building team Joint venture Cost driven (e., low cost to manufacture and install) Value driven (e.g., high residual value, high user value) Low operational cost driven (e.g., low maintenance costs) Sale	1.7.8.10.12.17.21.27.31.32 8 2.3.6.10.11.16-22.26.31.32 31 19 6.10.16.31 3.4.18 30 9
s model	BP4	Cost	20,22,26-			27-29,31,32,34	BP3.4-3 BP3.4-5 BP3.4-6 BP3.4-7 BP3.4-8 BP4.1-1 BP4.1-2 BP4.1-3	Strategic alliance between (non-competing) partners Industry association Co-creation Competition Building team Joint venture Cost driven (i.e., low cost to manufacture and install) Value driven (e.g., high residual value, high user value) Low operational cost driven (e.g., low maintenance costs)	1,7,8,10,12,17,21,27,31,32 8
less model	BP4	Cost	20,22,26-			27-29,31,32,34	BP3.4-3 BP3.4-4 BP3.4-5 BP3.4-6 BP3.4-7 BP3.4-8 BP4.1-1 BP4.1-2 BP4.1-3 BP5.1-1 BP5.1-2 BP5.1-3 BP5.1-4	Strategic alliance between (non-competing) partners industry association Co-creation Competition Building learn Joint venture Cost driven (i.e., low cost to manufacture and install) Value driven (i.e., low cost to manufacture and install) Low operational cost driven (e.g., low maintenance costs) Sale Sale with warrantee Sale and take-back guarantee	1,7,8,10,12,17,21,27,31,32 8 2,3,6,10,11,16-22,28,31,32 31 19 6,10,18,31 3,4,18 30 9 1-6,9+12,17-22,24-27,30-32,34 1,3,5,9,12,18,21,24,32,34 1,6,9-21,23 1,9-10,12,18-22,27
siness model	BP4	Cost	20,22,26-			27-29,31,32,34	BP3.4-3 BP3.4-4 BP3.4-5 BP3.4-6 BP3.4-7 BP3.4-8 BP4.1-1 BP4.1-2 BP4.1-3 BP5.1-1 BP5.1-2	Strategic alliance between (non-competing) partners Industry association Co-creation Co-creation Building team Joint venture Cost driven (i.e., low cost to manufacture and install) Value driven (e.g., high residual value, high user value) Low operational cost driven (e.g., low maintenance costs) Sale Sale with warrantee Sale and buy-back guarantee Sale and buy-back guarantee Sale with deposit	1,7,8,10,12,17,21,27,31,32 8
3usiness model	BP4	Cost	20,22,26-			27-29,31,32,34	BP3.4-3 BP3.4-4 BP3.4-5 BP3.4-6 BP3.4-6 BP3.4-7 BP4.1-1 BP4.1-2 BP4.1-3 BP5.1-1 BP5.1-2 BP5.1-3 BP5.1-4 BP5.1-5 BP5.1-6 BP5.1-7	Strategic alliance between (non-competing) partners industry association Co-creation Co-creation Building team Joint venture Cost driven (i.e., low cost to manufacture and install) Value driven (i.e., low) Value driven (i.e., low) Sale Sale with warrantee Sale and take-back guarantee Sale and take-back guarantee Sale and the deposit Product-service system (PSS) For-free	1,7,8,10,12,17,21,27,31,32 8 2,3,6,10,11,16-22,28,31,32 31 19 6,10,18,31 3,4,18 30 9 1-6,9+12,17-22,24-27,30-32,34 1,3,5,9+12,16,21,24,32,34 1,6,9+2,123 1,9+10,12,18-22,27 5,9+10,21,23,23 1,7-9+12,14,17,18,20-22,24,25,27,28,30,31,36 21,30
Business model	BP4	Cost	20,22,26- 31,34,36	BP4.1	Cost proposition	27-29,31,32,34	BP3.4-3 BP3.4-4 BP3.4-5 BP3.4-6 BP3.4-7 BP3.4-8 BP4.1-1 BP4.1-2 BP4.1-2 BP5.1-1 BP5.1-2 BP5.1-3 BP5.1-4 BP5.1-5 BP5.1-6	Strategic alliance between (non-competing) partners Industry association Co-creation Competition Building team Joint venture Cost driven (i.e., low cost to manufacture and install) Value driven (e.g., light residual value, high user value) Low operational cost driven (e.g., low maintenance costs) Sale Sale with warrantee Sale and take-back guarantee Sale and buy-back guarantee Sale with deposit Product-service system (PSS) Fro-free Product lesse	1,7,8,10,12,17,21,27,31,32 8 2,3,6,10,11,16-22,28,31,32 31 19 6,10,18,31 3,4,18 30 9 1-6,9-12,17-22,24-27,30-32,34 1,3,5,9,12,18,21,24,32,34 1,6,9,21,23 1,9,10,12,18-22,27 5,9,10,21,23,23 1,9,10,12,18-22,27 5,9,10,21,23,23 1,7,9-12,14,17,18,20-22,24,25,27,28,30,31,36 21,30
		Cost	20,22,26-	BP4.1		27-29,31,32,34 3,18	BP3.4-3 BP3.4-4 BP3.4-5 BP3.4-6 BP3.4-7 BP3.4-8 BP4.1-1 BP4.1-2 BP5.1-1 BP5.1-1 BP5.1-3 BP5.1-3 BP5.1-6 BP5.1-6 BP5.1-7 BP5.1-9 BP5.1-9 BP5.1-9	Strategic alliance between (non-competing) partners Industry association Co-creation Co-creation Building team Joint venture Cost driven (i.e., low cost to manufacture and install) Value driven (e.g., ligh residual value, high user value) Low operational cost driven (e.g., low maintenance costs) Sale Sale with warrantee Sale and take-back guarantee Sale with deposit Product-service system (PSS) Foo-free Product lease Pay-per-use Use subscription	1,7,8,10,12,17,21,27,31,32 8 2,3,6,10,11,16-22,28,31,32 31 19 6,10,18,31 3,4,18 30 9 1-6,9-12,17-22,24-27,30-32,34 1,3,5,9,12,18,21,24,32,34 1,6,9-21,23 1,9,10,12,18-22,27 5,9,10,21,22,32 1-7,9-12,14,17,18,20,22,24,25,27,28,30,31,36 21,30 1-3,5,9,10,17-21,24,25,27,30-32,34 1-3,5,9,10,17-21,24,25,27,30-32,34 1-3,5,9,10,17-12,12,25,27,30-32,34 1-3,5,9,10,17-12,12,25,27,30-32,34 1-3,5,9,10,17-12,12,20,21,31,34 2,6,10-12,17,18,20,26,31
	BP4	Cost structure	20,22,26- 31,34,36 1-4,6,8,10,17-	BP4.1	Cost proposition	27-29,31,32,34	BP3.4-3 BP3.4-4 BP3.4-5 BP3.4-6 BP3.4-7 BP3.4-8 BP4.1-1 BP4.1-2 BP4.1-3 BP5.1-1 BP5.1-2 BP5.1-3 BP5.1-6 BP5.1-5 BP5.1-8 BP5.1-9 BP5.1-10 BP5.1-10 BP5.1-10 BP5.1-10	Strategic alliance between (non-competing) partners industry association Co-creation Co-creation Competition Building team Joint venture Cost driven (i.e., low cost to manufacture and install) Value driven (i.e., low cost to manufacture and install) Value driven (i.e., low cost to manufacture and install) Low operational cost driven (i.e., low maintenance costs) Sale Sale with warrantee Sale and the warrantee Sale and buy-back guarantee Sale and buy-back guarantee Sale with deposit Product-service system (PSS) For-free Product-service system (PSS) For-free Product-service system (PSS) For-free Product-service system (PSS)	1.7.8.10.12.17.21.27.31.32 8 2.3.6.10.11.16-22.28.31.32 31 19 6.10.18.31 3.4.18 30 9 1-6.9-12.17-22.24-27.30-32.34 1.3.5.9.12.18.21.24.32.34 1.6.9.21.23 1.9.10.12.18-22.27 5.9.10.21.22.32 1.9.10.12.18-22.27 5.9.10.21.23.32 1.9.10.12.18.20.23.34 1.3.5.9.11.27.17.18.20.22.34 1.3.5.9.10.17.18.20.23.31 1.3.5.9.11.27.17.18.20.22.34 1.3.5.9.11.27.17.18.20.23.31
		Cost structure	20,22,26- 31,34,36 31,34,36 1-4,6,8,10,17- 22,24-	BP4.1	Cost proposition	27-29,31,32,34 3,18	BP3.4-3 BP3.4-5 BP3.4-5 BP3.4-6 BP3.4-7 BP3.4-7 BP4.1-1 BP4.1-2 BP4.1-2 BP5.1-1 BP5.1-2 BP5.1-3 BP5.1-4 BP5.1-6 BP5.1-7 BP5.1-9 BP5.1-10 BP5.1-10 BP5.1-10 BP5.1-10 BP5.1-10	Strategic alliance between (non-competing) partners industry association Co-creation Co-creation Building team Joint venture Cost driven (e.g. low cost to manufacture and install) Value driven (e.g. high residual value, high user value) Low operational cost driven (e.g., low maintenance costs) Sale Sale with warrantee Sale and take-back guarantee Sale and take-back guarantee Sale with deposit Product-service system (PSS) For-free Product-service system (PSS) For-free Pay-per-use Use subscription Rentlirie Pooling sharing Trading (fee)	1.7.8.10.12.17.21.27.31.32 8 2.3.6.10.11.16-22.26.31.32 31 19 6.10.16.31 3.4.18 30 9 1-6.9-12.17-22.24-27.30-32.34 1.3.5.9.12.18.23 1.9.10.12.18-22.27 5.9.10.21.22.32 1.7.9-12.14.17.18.20-22.24.25.27.28.30.31.36 21.30 1.3.5.9.11.12.17.18.20.21.31.34 1.3.5.9.11.12.17.18.20.22.24.25.30.31 1.3.5.9.11.12.17.18.20.22.24.25.30.31 1.3.5.9.11.12.17.18.20.22.24.25.30.31
		Cost structure	20,22,26- 31,34,36 31,34,36 1-4,6,8,10,17- 22,24-	BP4.1	Cost proposition	27-29,31,32,34 3,18	BP3.4-3 BP3.4-5 BP3.4-5 BP3.4-6 BP3.4-7 BP3.4-8 BP4.1-1 BP4.1-2 BP4.1-3 BP5.1-1 BP5.1-3 BP5.1-4 BP5.1-6 BP5.1-7 BP5.1-6 BP5.1-7 BP5.1-1 BP5.1-1 BP5.1-1 BP5.1-1 BP5.1-1 BP5.1-1 BP5.1-1 BP5.1-1 BP5.1-1 BP5.1-1 BP5.1-1 BP5.1-1	Strategic alliance between (non-competing) partners industry association Co-creation Co-creation Co-creation Competition Building team Joint venture Cost driven (i.e., low cost to manufacture and install) Value driven (i.e., low cost to manufacture and install) Value driven (i.e., low cost to manufacture and install) Low operational cost driven (i.e., low maintenance costs) Sale with warrantee Sale with warrantee Sale and take-back guarantee Sale and take-back guarantee Sale with deposit Product-service system (PSS) For free Product lease	1.7,8,10,12,17,21,27,31,32 8 2.3,6,10,11,16-22,28,31,32 31 19 6.10,16,31 3.4,18 30 9 1-6,9-12,17-22,24-27,30-32,34 1.3,5,9,12,18,21,24,32,34 1.5,5,21,23 1.9,10,12,18-22,7 5,9,10,21,12,32 1.9,10,12,18-22,7 5,9,10,21,12,32 1.3,5,9,10,17-21,24,25,27,30-32,34 1.3,5,9,10,17-11,12,02,22,31 1.3,5,9,10,17-11,12,02,22,31 1.3,5,9,11,17,118,02,02,24,25,30,31 1.3,5,9,11,21,118,02,02,24,25,30,31 1.3,5,9,11,21,118,02,02,24,25,30,31 1.3,5,9,11,21,118,02,02,24,25,30,31 1.3,5,9,11,21,118,02,02,24,25,30,31 1.3,5,9,11,21,118,02,02,24,25,30,31 1.3,5,9,11,21,118,02,02,24,25,30,31 1.3,5,9,11,21,118,02,02,24,25,30,31 1.3,5,9,11,21,718,02,02,31 1.3,5,9,11,21,718,02,02,31 1.3,5,9,11,21,718,02,02,31 1.3,5,9,11,21,712,03,11 1.3,5,9,11,21,712,03,11
		Cost structure	20,22,26- 31,34,36 31,34,36 1-4,6,8,10,17- 22,24-	BP4.1	Cost proposition	27-29,31,32,34 3,18	BP3.4-3 BP3.4-5 BP3.4-5 BP3.4-6 BP3.4-7 BP3.4-8 BP4.1-1 BP4.1-2 BP5.1-1 BP5.1-3 BP5.1-3 BP5.1-4 BP5.1-5 BP5.1-6 BP5.1-1	Strategic alliance between (non-competing) partners industry association Co-creation Co-creation Building team Joint venture Cost driven (i.e., low cost to manufacture and install) Value driven (i.e., low cost to manufacture and install) Value driven (i.e., low cost to manufacture and install) Low operational cost driven (i.e., low maintenance costs) Sale Sale with warrantee Sale and bake-back guarantee Sale and bake-back guarantee Sale and by-back guarantee Sale with deposit Product-service system (PSS) For-free Product-service system (PSS) For-free Product-service system (PSS) For-free Praduct-service system (PSS) For-free Praduct-service system (PSS) For-free Praduct-service system (PSS) For-free Profunds (PSS) For-free Pooling /Abaring Trading (Fee) Performance lease Pay-per-service Reward system (e.g., bonus-malus points, discount on new purchase)	1.7.8.10.12.17.21.27.31.32 8 2.3.6.10.11.16-22.28.31.32 31 19 6.10.18.31 3.4.18 30 9 1-6.9-12.17-22.24-27.30-32.34 1.3.5.9.12.18.21.24.32.34 1.6.9.21.23 1.9.10.12.18-22.27 5.9.10.21.22.32 1.9.10.12.18-22.27 5.9.10.21.22.32 1.9.10.12.18-22.27 5.9.10.21.23.34 1.3.5.9.11.21.71.18.20.22.34 1.3.5.9.10.77-21.24.25.27.30-32.34 1.3.5.9.11.27.17.18.20.22.31 1.3.5.9.11.27.17.18.20.22.31 1.3.5.9.11.27.17.18.20.22.31 1.3.5.9.11.27.18.20.22.31 1.3.5.9.11.27.18.20.22.31 1.3.5.9.11.27.18.20.22.31 1.3.5.9.11.27.18.20.22.31
		Cost structure	20,22,26- 31,34,36 31,34,36 1-4,6,8,10,17- 22,24-	BP4.1	Cost proposition	27-29,31,32,34 3,18	BP3.4-3 BP3.4-5 BP3.4-5 BP3.4-6 BP3.4-7 BP3.4-8 BP4.1-1 BP4.1-2 BP5.1-1 BP5.1-2 BP5.1-3 BP5.1-4 BP5.1-8 BP5.1-8 BP5.1-1 BP5.1-	Strategic alliance between (non-competing) partners Industry association Co-creation Co-creation Strategic alliance strategic and strategic alliance strategic allian	1,7,8,10,12,17,21,27,31,32 8 2,3,6,10,11,16-22,28,31,32 31 19 6,10,18,31 3,4,18 30 9 1-6,9-12,17-22,24-27,30-32,34 1,3,5,9,12,18,21,23,34 1,3,5,9,12,18,21,23,34 1,3,5,9,12,18,21,23,34 1,3,5,9,12,18,21,23,34 1,3,5,9,12,18,21,23,34 1,3,5,9,11,18,20,22,24,25,27,28,30,31,36 21,30 1-3,5,9,10,17-21,24,25,27,30-32,34 1-3,5,9,10,17-21,18,20,22,34,25,30,31 1-3,5,9,10,17-21,18,20,21,31,34 2,6,10-12,17,18,20,22,31 1-3,5,9,10,17-21,18,20,22,34,25,30,31 1-3,5,9,12,18,21,22,28 1-3,3,6,9,12,18,21,22,28 1-3,3,6,9,12,18,21,22,28 1-3,4,6,10,12,17,18,20,22,27,31 1,5,9,10,12,17,18,20,22,27,31 1,5,9,10,12,17,18,20,22,27,31 1,5,9,10,12,17,18,20,22,27,31 1,5,9,10,12,17,18,20,22,27,31 1,5,9,10,12,17,18,20,22,27,31 1,5,9,10,12,17,18,20,22,27,31
		Cost structure	20,22,26- 31,34,36 31,34,36 1-4,6,8,10,17- 22,24-	BP4.1	Cost proposition	27-29,31,32,34 3,18	BP3.4-3 BP3.4-4 BP3.4-5 BP3.4-6 BP3.4-6 BP3.4-6 BP3.4-7 BP3.4-7 BP4.1-1 BP4.1-2 BP4.1-3 BP5.1-1 BP5.1-1 BP5.1-6 BP5.1-1	Strategic alliance between (non-competing) partners industry association Co-creation Co-creation Co-creation Building leam Joint venture Cost driven (i.e., low cost to manufacture and install) Value driven (i.e., low cost to manufacture and install) Value driven (i.e., low cost to manufacture and install) Low operational cost driven (i.e., low maintenance costs) Sale with warrantee Sale and take-back guarantee Sale and take-back guarantee Sale and take-back guarantee Sale with deposit Product-service system (PSS) For-free Product-service system (PSS) For-free Product lease Pray-per-use Use subscription Renthire Pooling /sharing Trading (fee) Parformance lease Pay-per-service Reward system (i.e., b. nous-malus points, discount on new purchase) Service subscription Income division per company Income divis	1.7,8,10,12,17,21,27,31,32 8 2.3,6,10,11,16-22,28,31,32 31 19 6.10,16,31 3.4,18 30 9 1-6,9-12,17-22,24-27,30-32,34 1.3,5,9,12,18,21,24,32,34 1.3,5,9,12,18,21,24,32,34 1.5,9,21,23 1.9,10,12,18-22,27 5,9,10,21,12,32 1.3,0 1.3,5,9,10,17,18,20,22,24,25,27,28,30,31,36 21,30 1.3,5,9,11,21,17,18,20,22,31 1.3,5,9,11,21,71,18,20,22,31 1.3,5,9,11,21,71,18,20,22,31 1.3,5,9,11,21,71,18,20,22,31 1.3,5,9,11,21,71,18,20,22,31 1.3,5,9,11,21,71,18,20,22,31 1.3,5,9,11,21,71,18,20,22,31 1.3,5,9,11,21,71,18,20,22,31 1.3,5,9,11,21,71,18,20,22,31 1.3,5,9,10,12,18,12,22,5 1.3,6,9,10,12,17,20,31 1.5,5,9,10,12,18,12,22,5 1.3,6,9,10,12,18,12,22,5 1.3,6,9,10,12,18,12,23,1 1.5,9,10,12,18,12,23,1
		Cost structure	20,22,26- 31,34,36 31,34,36 1-4,6,8,10,17- 22,24-	BP4.1	Cost proposition Financial arrangement	27-29,31,32,34 3,18 3,18 1-4,7,10,11,15,17-21,25 28,30-32,34,36	BP3.43 BP3.44 BP3.45 BP3.45 BP3.46 BP3.46 BP3.46 BP3.47 BP4.12 BP5.14 BP5.12 BP5.14 BP5.15 BP5.14 BP5.15 BP5.16 BP5.17 BP5.11 BP5.14 BP5.17 BP	Strategic alliance between (non-competing) partners Industry association Co-creation Co-creation Strategic alliance strategic and strategic alliance strategic allian	1,7,8,10,12,17,21,27,31,32 8,2,3,6,10,11,16-22,28,31,32 31 19,6,10,18,31 3,4,18 30,9 9,16,9,12,17-22,24-27,30-32,34 1,3,5,9,12,16,21,24,32,34 1,3,5,9,12,16,21,24,32,34 1,6,9,12,123 1,9,10,12,18-22,27 5,9,10,21,23,2 1,7,9-12,14,17,18,20-22,24,25,27,28,30,31,36 21,30 1-3,5,9,11,18,20,21,31,34 2,6,10-12,17,18,20,21,31,34 2,6,10-12,17,18,20,21,31,34 2,6,10-12,17,18,20,21,31,34 1,3,5,9,11,18,21,18,20,21,31,34 1,3,5,9,11,18,21,22,25 1,3,5,9,12,18,21,22,25 1,3,6,9,10,17,21,18,20,22,24,25,30,31 1,5,5,9,10,18,21,22,25 1,3,6,9,10,12,17,18,20,22,27,31 5,9,10,12,18,21,22,25 1,3,6,9,10,17,18,20,22,27,31 5,9,10,12,18,21,22,31 1,5,6,9,10,12,17,18,20,22,27,31 5,9,10,12,18,21,22,31 1,5,0,10,14,19,20,22
		Cost structure	20,22,26- 31,34,36 31,34,36 1-4,6,8,10,17- 22,24-	BP4.1	Cost proposition Financial arrangement	27-29,31,32,34 3,18 3,18 1-4,7,10,11,15,17-21,25 28,30-32,34,36	BP3.43 BP3.44 BP3.45 BP3.45 BP3.46 BP3.47 BP3.46 BP4.17 BP3.48 BP4.17 BP3.48 BP5.13 BP5.13 BP5.13 BP5.13 BP5.14 BP5.15 BP5.13 BP5.14 BP5.15 BP5.17 BP5.14 BP5.17 BP5.18 BP5.17 BP5.19 BP5.11 BP5.17 BP5.19 BP5.11 BP	Strategic alliance between (non-competing) partners industry association Co-creation Co-creation Conpetition Building team Joint venture Cost driven (i.e., low cost to manufacture and install) Value driven (i.e., low cost to manufacture and install) Low operational cost driven (e.g., low maintenance costs) Sale Sale with warrantee Sale with warrantee Sale with warrantee Sale with warrantee Sale and buy-back guarantee Sale and buy-back guarantee Sale and buy-back guarantee Sale with deposit Product-service system (PSS) For-free Product-lease Product-service system (PSS) For-free Product-lease Produ	1,7,8,10,12,17,21,27,31,32 8 2,3,6,10,11,16-22,28,31,32 31 19 6,10,18,31 3,4,18 30 9 1-6,9-12,17-22,24-27,30-32,34 1,3,5,9,12,18,21,24,32,34 1,6,9-2,123 1,9,10,12,18-22,27 5,9,10,21,23 1-3,5,9,10,17-21,24,25,27,30-32,34 1-3,5,9,10,17-21,24,25,27,30-32,34 1-3,5,9,11,11,17,18,20-22,24,25,27,38,30,31,36 21,30 1-3,5,9,10,17-21,24,25,27,30-32,34 1-3,5,9,11,12,17,18,20,22,31 1-3,5,9,10,17-21,24,25,27,30-32,34 1-3,5,9,11,12,17,18,20,22,31 1-3,5,9,10,12,17,18,20,22,31 1-3,5,9,10,12,17,18,20,22,31 1-3,5,9,10,12,17,18,20,22,31 1-3,5,9,10,12,17,18,20,22,31 1-3,5,9,10,12,17,18,20,22,31 1-5,9,10,12,17,18,20,22,31 1-5,9,10,12,17,18,20,22,31 1-5,9,10,12,17,18,20,22,31 1-5,9,10,12,17,18,20,22,31 1-5,9,10,12,17,18,20,22,31 1-5,9,10,12,17,18,20,22,31 1-5,9,10,12,17,18,20,22,31 1-5,10,14,19,20,22 1-3,19
		Cost structure	20,22,26- 31,34,36 31,34,36 1-4,6,8,10,17- 22,24-	BP4.1	Cost proposition Financial arrangement	27-29,31,32,34 3,18 3,18 1-4,7,10,11,15,17-21,25 28,30-32,34,36	BP34.5 BP3.44 BP3.45 BP3.46 BP3.47 BP3.48 BP4.12 BP4.12 BP4.12 BP4.13 BP5.14 BP	Strategic alliance between (non-competing) partners industry association Co-creation Co-creation Building team Joint venture Cost driven (e.g. low cost to manufacture and install) Value driven (e.g. high residual value, high user value) Low operational cost driven (e.g., low maintenance costs) Sale Sale with warrantee Sale and taby-back guarantee Sale and taby-back guarantee Sale and taby-back guarantee Sale and they-cost guarantee Sale was sale with deposit Product-service system (PSS) For-free Product-service system (PSS) For-free Pay-per-sure Use subscription Renthire Pooling /sharing Trading (fee) Performance lease Pay-per-service Reward system (e.g., bonus-malus points, discount on new purchase) Sarvice subscription Income division in 'min' coalitions Income division in 'min' coalitions Building Building components Products	1.7.8.10.12.17.21.27.31.32 8 2.3.6.10.11.16-22.26.31.32 31 19 6.10.16.31 3.4.18 30 9 1-6.9-12.17-22.24-27.30-32.34 1.3.5.9.12.18-2.24 1.3.5.9.12.18-2.27 5.9.10.21.23.23 1.9.10.12.18-22.27 5.9.10.21.23.23 1.9.10.12.18-22.27 5.9.10.21.23.31 1.3.5.9.11.21.21.23.33 1.3.5.9.11.21.21.23.33 1.3.5.9.11.21.21.23.33 1.3.5.9.11.21.21.23.33 1.3.5.9.11.21.21.23.33 1.3.5.9.11.21.21.23.33 1.3.5.9.11.21.21.23.33 1.3.5.9.11.21.21.23.33 1.3.5.9.11.21.21.23.33 1.3.5.9.11.21.21.23.22.24.25.27.30 1.3.5.6.9.10.12.17.18.20.22.24.25.30.31 1.3.5.9.11.21.71.82.02.22.24.25.30.31 1.3.5.9.11.21.71.82.02.22.24.25.30.31 1.3.5.9.11.21.71.82.02.22.27.31 5.9.10.12.18.21.22.25 1.3.4.6.10.12.17.19.25.27 19 19 19.14 19.14 19.17.9.13.17.28.30.34
		Cost structure	20,22,26- 31,34,36 31,34,36 1-4,6,8,10,17- 22,24-	BP4.1	Cost proposition Financial arrangement Income division	27-29,31,32,34 3,18 1-4,7,10,11,15,17-21,25 28,30-32,34,36	BP3.43 BP3.44 BP3.45 BP3.45 BP3.46 BP3.47 BP3.46 BP4.17 BP3.48 BP4.17 BP3.48 BP5.13 BP5.13 BP5.13 BP5.13 BP5.14 BP5.15 BP5.13 BP5.14 BP5.15 BP5.17 BP5.14 BP5.17 BP5.18 BP5.17 BP5.19 BP5.11 BP5.17 BP5.19 BP5.11 BP	Strategic alliance between (non-competing) partners industry association Co-creation Co-creation Conpetition Building team Joint venture Cost driven (i.e., low cost to manufacture and install) Value driven (i.e., low cost to manufacture and install) Low operational cost driven (e.g., low maintenance costs) Sale Sale with warrantee Sale with warrantee Sale with warrantee Sale with warrantee Sale and buy-back guarantee Sale and buy-back guarantee Sale and buy-back guarantee Sale with deposit Product-service system (PSS) For-free Product-lease Product-service system (PSS) For-free Product-lease Produ	1,7,8,10,12,17,21,27,31,32 8 2,3,6,10,11,16-22,28,31,32 31 19 6,10,18,31 3,4,18 30 9 1-6,9-12,17-22,24-27,30-32,34 1,3,5,9,12,18,21,24,32,34 1,6,9-2,123 1,9,10,12,18-22,27 5,9,10,21,23 1-3,5,9,10,17-21,24,25,27,30-32,34 1-3,5,9,10,17-21,24,25,27,30-32,34 1-3,5,9,11,11,17,18,20-22,24,25,27,38,30,31,36 21,30 1-3,5,9,10,17-21,24,25,27,30-32,34 1-3,5,9,11,12,17,18,20,22,31 1-3,5,9,10,17-21,24,25,27,30-32,34 1-3,5,9,11,12,17,18,20,22,31 1-3,5,9,10,12,17,18,20,22,31 1-3,5,9,10,12,17,18,20,22,31 1-3,5,9,10,12,17,18,20,22,31 1-3,5,9,10,12,17,18,20,22,31 1-3,5,9,10,12,17,18,20,22,31 1-5,9,10,12,17,18,20,22,31 1-5,9,10,12,17,18,20,22,31 1-5,9,10,12,17,18,20,22,31 1-5,9,10,12,17,18,20,22,31 1-5,9,10,12,17,18,20,22,31 1-5,9,10,12,17,18,20,22,31 1-5,9,10,12,17,18,20,22,31 1-5,10,14,19,20,22 1-3,19
		Cost structure	20,22,26- 31,34,36 31,34,36 1-4,6,8,10,17- 22,24-	BP4.1	Cost proposition Financial arrangement Income division	27-29,31,32,34 3,18 3,18 1-4,7,10,11,15,17-21,25 28,30-32,34,36	BP34.5 BP3.44 BP3.44 BP3.45 BP3.46 BP3.47 BP3.48 BP3.47 BP3.48 BP5.14 BP5.15 BP5.16 BP5.17 BP5.17 BP5.17 BP5.18 BP5.17 BP5.19 BP5.11 BP	Strategic alliance between (non-competing) partners industry association Co-creation Co-creation Co-creation Building team Joint venture Cost driven (i.e., low cost to manufacture and install) Value driven (i.e., low cost to manufacture and install) Value driven (i.e., low cost to manufacture and install) Low operational cost driven (i.e., low maintenance costs) Sale with warrantee Sale and take-back guarantee Sale and take-back guarantee Sale and bake-back guarantee Sale with deposit Product-service system (PSS) For-free Product-service system (PSS) For-free Product-service system (PSS) For-free Product-service system (PSS) For-free Profunds (Sale system) Pay-per-use Use subscription Renthire Pooling /abraing Trading (fee) Performance lease Pay-per-service Reward system (i.e., bonus-malus points, discount on new purchase) Service subscription Income division per company Income divisio	1.7.8.10.12.17.21.27.31.32 8 2.3.6.10.11.16-22.28.31.32 31 19 6.10.18.31 3.4.18 30 9 1-6.9-12.17-22.24-27.30-32.34 1.3.5.9.12.18.21.24.32.34 1.6.9.21.23 1.9.10.12.18-22.27 5.9.10.21.23.2 1.9.10.12.12.33 1.9.10.12.12.33
		Cost structure	20,22,26- 31,34,36 31,34,36 1-4,6,8,10,17- 22,24-	BP5.1	Cost proposition Financial arrangement Income division	27-29,31,32,34 3,18 1-4,7,10,11,15,17-21,25 28,30-32,34,36 10,19,20,28 1-3,5-7,9,10,12,17-	BP3.43 BP3.44 BP3.45 BP3.46 BP3.47 BP3.46 BP3.47 BP3.48 BP4.12 BP4.13 BP5.12 BP5.13 BP5.14 BP5.15 BP5.17 BP5.18 BP5.17 BP5.18 BP5.11 BP5.17 BP5.19 BP5.11 BP5.17 BP5.19 BP5.11 BP	Strategic alliance between (non-competing) partners industry association Co-creation Co-creation Co-creation Conpetition Building team Joint venture Cost driven (i.e., low cost to manufacture and install) Value driven (i.e., low cost to manufacture and install) Low operational cost driven (e.g., low maintenance costs) Sale Sale with warrantee Sale with warrantee Sale with warrantee Sale with warrantee Sale with seposit Product-sensities (partners) Sale and buy-back guarantee Sale with deposit Product-lease Sale with operation (PSS) For-free Product-lease Product-lease Pay-per-use Use subscription Performance lease Pay-per-service Pay-per-service Sale with variant (i.e., bonus-malus points, discount on new purchase) Sarvice subscription Income division per company Income division in mimit coalitions Income division over the value chain Building Building Components or parts (e.g., for repair or updates) Materials Resources Service (e.g., maintenance, advice, connecting, brokering)	1,7,8,10,12,17,21,27,31,32 8 2,3,6,10,11,16-22,28,31,32 31 19 6,10,18,31 3,4,18 30 9 1-6,9-12,17-22,24-27,30-32,34 1,3,5,9,12,18,21,24,32,34 1,6,9-2,123 1,9,10,12,18-22,27 5,9,10,21,23 1,9,10,12,18-22,27 5,9,10,21,12,32 1,3,5,9,10,17-21,24,25,27,30-32,34 1,3,5,9,11,12,17,18,20-22,24,25,27,38,30,31,36 21,30 1-3,5,9,10,17-21,24,25,27,30-32,34 1-3,5,9,10,17-21,24,25,27,30-32,34 1-3,5,9,10,17-12,124,25,27,30-32,34 1-3,5,9,11,12,17,18,20,22,31 1,3,5,9,11,12,17,18,20,22,31 1,3,5,9,11,12,17,18,20,22,31 1,5,9,10,12,17,18,20,22,31 1,5,9,10,12,17,18,20,22,7,31 5,9,10,12,17,18,20,22,7,31 5,9,10,12,17,18,20,22,7,31 1,5,9,10,12,17,18,20,22,7,31 1,5,9,10,12,17,18,20,22,7,31 1,5,9,10,12,17,18,20,22,7,31 1,5,9,10,12,17,18,20,22,7,31 1,5,9,10,12,11,12,231 1,5,9,10,12,11,12,12,31 1,10,11,12,12,13,14 1,10,11,12,12,13,14 1,10,11,12,11,12,13,14 1,10,11,12,11,12,13,14 1,10,11,12,11,12,13,14 1,10,11,12,11,12,11,13,14 1,10,11,12,11,12,11,12,11 1,10,11,12,11,12,11 1,10,11,12,11,12,11 1,10,11,12,11,12,11 1,10,11,12,11,12,11 1,10,11,12,11,12,11 1,10,11,12,11,12,11 1,10,11,12,11,12,11 1,10,11,12,11,12,11 1,10,11 1,10,11
		Cost structure	20,22,26- 31,34,36 31,34,36 1-4,6,8,10,17- 22,24-	BP5.1	Cost proposition Financial arrangement Income division	27-29,31,32,34 3,18 1-4,7,10,11,15,17-21,25 28,30-32,34,36 10,19,20,28 1-3,5-7,9,10,12,17-	BP3.43 BP3.44 BP3.45 BP3.46 BP3.47 BP3.48 BP3.47 BP3.48 BP3.47 BP3.48 BP5.13 BP5.13 BP5.13 BP5.13 BP5.14 BP5.15 BP5.17 BP6.17 BP6.18	Strategic alliance between (non-competing) partners industry association Co-creation Co-creation Co-creation Co-creation Co-creation Side of the control of	1.7,8,10,12,17,21,27,31,32 8 2.3,6,10,11,16-22,28,31,32 31 19 6.10,16,31 3.4,18 30 9 1-6,9-12,17-22,24-27,30-32,34 1.3,5,9,12,18,21,24,32,34 1.3,5,9,12,18,21,24,32,34 1.5,5,9,12,12,23 1.9,10,12,18,22,27 5,9,10,21,22,32 1.3,5,9,10,17-21,24,25,27,30-32,34 1.3,5,9,10,17-21,24,25,27,30-32,34 1.3,5,9,11,21,17,18,20,22,24,25,27,38,30,31,36 21,30 1.3,5,9,11,21,17,18,20,22,31 1.3,5,9,11,21,17,18,20,22,31 1.3,5,9,11,21,71,18,20,22,31 1.3,5,9,11,21,71,20,32,31 1.3,5,9,11,21,71,20,31 1.5,5,9,10,12,12,12,25 1.3,4,6,10,12,17,12,03,13 1.5,5,9,10,12,18,12,22,51 1.5,9,10,12,18,12,23,1 1.5,9,10,12,17,18,20,22,13 1.5,9,10,12,17,18,20,22,13 1.5,9,10,12,17,18,20,22,13 1.5,9,10,12,17,18,20,22,13 1.5,9,10,12,12,12,31 1.5,9,10,12,12,13,1 1.5,9,10,12,12,13,1 1.5,9,10,12,12,13,1 1.5,9,10,12,12,13,1 1.5,9,10,12,12,13,1 1.5,9,10,12,12,13,1 1.5,9,10,12,12,13,1 1.5,9,10,12,12,13,1 1.5,9,10,12,12,13,1 1.5,9,10,12,12,13,20,22,27,31 1.5,9,10,12,12,13,20,22,27,34 1.5,9,12,18,20,22,25,27 1.7,9,14,17,28,30,35 1.3,4,6,12,20,22,25,27,30,32,34
		Cost structure	20,22,26- 31,34,36 31,34,36 1-4,6,8,10,17- 22,24-	BP5.1	Cost proposition Financial arrangement Income division	27-29,31,32,34 3,18 1-4,7,10,11,15,17-21,25 28,30-32,34,36 10,19,20,28 1-3,5-7,9,10,12,17-	BP34.5 BP3.44 BP3.45 BP3.46 BP3.47 BP3.48 BP3.47 BP4.12 BP4.12 BP4.12 BP5.13 BP5.13 BP5.14 BP5.13 BP5.14 BP5.14 BP5.14 BP5.19 BP5.19 BP5.19 BP5.11 BP	Strategic alliance between (non-competing) partners industry association Co-creation Co-creation Co-creation Building team Joint venture Cost driven (e.g. lov cost for manufacture and install) Value driven (e.g. high residual value, high user value) Low operational cost driven (e.g., low maintenance costs) Sale Sale with warrantee Sale and take-back guarantee Sale and take-back guarantee Sale and buy-back guarantee Sale with deposit Product-service system (PSS) For-free Profuct-service system (PSS) For-free Pay-per-use Use subscription Renthire Pooling /sharing Trading (fee) Performance lease Reward system (e.g., borus-malus points, discount on new purchase) Sarvice subscription Income division in 'min' coalitions Income division in 'min' coalitions Income division in 'min' coalitions Building Building Building Resources Revard system (e.g., for repair or updates) Makerians Resources Reveroice, g., maintenance, advice, connecting, brokering) Consumables Use	1.7.8.10.12.17.21.27.31.32 8 2.3.6.10.11.16-22.26.31.32 31 19 6.10.16.31 3.4.18 30 9 1-6.9-12.17-22.24-27.30-32.34 1.3.5.9.12.18.2.23 1.3.5.9.12.18.2.23 1.9.10.12.18-2.27 5.9.10.21.22.32 1.9.10.12.18-2.27 5.9.10.21.22.31 1.3.5.9.11.12.17.18.20.22.24.25.27.28.30.31.36 21.30 1.3.5.9.11.12.17.18.20.21.31.34 2.6.10-12.17.18.20.21.31.34 1.3.5.9.11.12.17.18.20.22.24.25.27.30.31 1.3.5.9.11.12.17.18.20.22.24.25.30.31 1.3.5.9.11.12.17.18.20.22.24.25.30 1.3.5.9.11.12.17.18.20.22.27.31 1.3.5.9.10.17.21.24.25.27.30.32 1.3.5.9.11.12.17.18.20.22.24.25.30.31 1.3.5.9.11.12.17.18.20.22.24.25.30.31 1.3.5.9.11.12.17.18.20.22.24.25.30 1.3.5.9.11.18.20.22.37 1.3.6.10.12.17.20.31 1.3.5.9.10.18.21.22.25 1.3.4.6.10.12.17.20.31 1.5.9.10.12.18.20.22.27.31 1.9.10.12.18.20.22.27.31 1.9.10.12.18.20.22.25.27 1.9.11.20.22.25.27 1.9.11.20.22.25.27 1.9.11.20.22.25.27 1.9.11.20.22.25.27 1.9.91.17.30.30.35 1.3.4.8.9.12.20.22.24.27.34 1.6.0.12.77.30.30.35 1.3.4.8.9.12.20.22.25.27 1.9.91.27.30.30.35 1.3.4.8.9.12.20.22.25.27 1.9.91.27.30.30.35 1.3.4.8.9.12.20.22.25.27.34
		Cost structure	20,22,26- 31,34,36 31,34,36 1-4,6,8,10,17- 22,24-	BP5.1	Cost proposition Financial arrangement Income division	27-29,31,32,34 3,18 1-4,7,10,11,15,17-21,25 28,30-32,34,36 10,19,20,28 1-3,5-7,9,10,12,17-	BP34.5 BP3.44 BP3.45 BP3.46 BP3.47 BP3.48 BP3.47 BP4.12 BP4.12 BP4.12 BP5.13 BP5.13 BP5.14 BP5.13 BP5.14 BP5.14 BP5.14 BP5.19 BP5.19 BP5.19 BP5.11 BP	Strategic alliance between (non-competing) partners industry association Co-creation Co-creation Co-creation Co-creation Co-creation Side of the control of	1.7,8,10,12,17,21,27,31,32 8 2.3,6,10,11,16-22,28,31,32 31 19 6.10,16,31 3.4,18 30 9 1-6,9-12,17-22,24-27,30-32,34 1.3,5,9,12,18,21,24,32,34 1.3,5,9,12,18,21,24,32,34 1.5,5,9,12,12,23 1.9,10,12,18,22,27 5,9,10,21,22,32 1.3,5,9,10,17-21,24,25,27,30-32,34 1.3,5,9,10,17-21,24,25,27,30-32,34 1.3,5,9,11,21,17,18,20,22,24,25,27,38,30,31,36 21,30 1.3,5,9,11,21,17,18,20,22,31 1.3,5,9,11,21,17,18,20,22,31 1.3,5,9,11,21,71,18,20,22,31 1.3,5,9,11,21,71,20,32,31 1.3,5,9,11,21,71,20,31 1.5,5,9,10,12,12,12,25 1.3,4,6,10,12,17,12,03,13 1.5,5,9,10,12,18,12,22,51 1.5,9,10,12,18,12,23,1 1.5,9,10,12,17,18,20,22,13 1.5,9,10,12,17,18,20,22,13 1.5,9,10,12,17,18,20,22,13 1.5,9,10,12,17,18,20,22,13 1.5,9,10,12,12,12,31 1.5,9,10,12,12,13,1 1.5,9,10,12,12,13,1 1.5,9,10,12,12,13,1 1.5,9,10,12,12,13,1 1.5,9,10,12,12,13,1 1.5,9,10,12,12,13,1 1.5,9,10,12,12,13,1 1.5,9,10,12,12,13,1 1.5,9,10,12,12,13,1 1.5,9,10,12,12,13,20,22,27,31 1.5,9,10,12,12,13,20,22,27,34 1.5,9,12,18,20,22,25,27 1.7,9,14,17,28,30,35 1.3,4,6,12,20,22,25,27,30,32,34
		Cost structure	20,22,26- 31,34,36 31,34,36 1-4,6,8,10,17- 22,24-	BP5.1	Cost proposition Financial arrangement Income division	27-29,31,32,34 3,18 1-4,7,10,11,15,17-21,25 28,30-32,34,36 10,19,20,28 1-3,5-7,9,10,12,17-	BP34.9 BP3.44 BP3.45 BP3.46 BP3.47 BP3.48 BP3.47 BP3.48 BP4.12 BP4.13 BP4.12 BP4.13 BP5.13 BP5.14 BP5.15 BP5.14 BP5.15 BP5.14 BP5.15 BP5.17 BP5.19 BP	Strategic alliance between (non-competing) partners industry association Co-creation Co-creation Go-creation Building team Joint venture Cost driven (e.g. low cost to manufacture and install) Value driven (e.g., high residual value, high user value) Low operational cost driven (e.g., low maintenance costs) Sale Sale with warrantee Sale and the host quarantee Sale and buy-back guarantee Sale and buy-back guarantee Sale and buy-back guarantee Sale with deposit Product-service system (PSS) For-free Product-service system (PSS) For-free Product-service system (PSS) For-free Pray-per-use Use subscription Renthire Pooling /sharing Trading (fee) Performance lease Pay-per-service Reyeard system (e.g., bonus-malus points, discount on new purchase) Service subscription Income division in 'mini' coalitions Income division in 'mini' coalitions Income division over the value chain Building Building components Products Resources Service (e.g., maintenance, advice, connecting, brokering) Consumables Use Use under the value chain Products Sub-brains Resources Service (e.g., maintenance, advice, connecting, brokering) Consumables Use energy Value through high service / performance / customer experience Value through reduction of costs by encouraging sufficiency Value through reduction of costs by encouraging sufficiency	1.7.8.10.12.17.21.27.31.32 8 2.3.6.10.11.16-22.26.31.32 31 19 6.10.16.31 3.4.18 30 9 1-6.9-12.17-22.24-27.30-32.34 1.3.5.9.12.18.22.27 5.9.10.21.22.32 1.9.10.12.18-22.27 5.9.10.21.22.32 1.9.10.12.18-22.27 5.9.10.21.23.32 1.9.10.17.21.24.25.27.30-32.34 1.3.5.9.10.17.21.24.25.27.30-32.34 1.3.5.9.10.17.18.20.22.31 1.3.5.9.10.17.18.20.23.31 1.3.5.9.10.17.18.20.23.31 1.3.5.9.10.17.18.20.23.31 1.3.5.9.10.17.18.20.23.31 1.3.5.9.11.21.71.80.20.23.31 1.3.5.9.11.21.71.80.20.23.31 1.3.5.9.11.21.71.80.20.23.31 1.3.5.9.11.21.71.80.20.23.31 1.3.5.9.11.21.71.80.20.23.31 1.3.5.9.11.21.71.80.20.23.31 1.3.5.9.11.21.71.80.20.23.31 1.3.5.9.11.21.71.80.20.23.31 1.3.5.9.11.21.71.80.20.23.31 1.3.5.9.11.21.71.80.20.27.31 1.3.5.9.10.12.17.80.20.31 1.3.5.9.11.21.22.22 1.3.48.10.22.27.31 5.9.10.18.20.22.27.31 5.9.12.18.20.22.24.27.34 1.3.5.9.12.18.20.22.25.27 1.5.9.12.18.20.22.25.27 1.5.9.12.18.20.22.25.27 1.5.9.12.18.20.22.25.27 1.5.9.12.18.20.22.25.27 1.5.9.12.18.20.22.25.27 1.5.9.12.18.20.22.25.27 1.5.9.12.17.18.20.22.24.27.34 1.6.9.12.17.18.20.22.24.27.31 1.6.9.12.17.18.20.22.24.27.31 1.6.9.12.17.18.20.22.24.27.31 1.6.9.12.17.18.20.22.24.27.31 1.6.9.12.17.18.20.22.24.27.31 1.5.9.12.17.18.20.22.24.27.31
		Cost structure	20,22,26- 31,34,36 31,34,36 1-4,6,8,10,17- 22,24-	BP5.1	Cost proposition Financial arrangement Income division	27-29,31,32,34 3,18 1-4,7,10,11,15,17-21,25 28,30-32,34,36 10,19,20,28 1-3,5-7,9,10,12,17-	BP3.43 BP3.44 BP3.45 BP3.46 BP3.47 BP3.46 BP4.17 BP3.48 BP4.17 BP5.12 BP5.13 BP5.13 BP5.13 BP5.17 BP5.16 BP5.17 BP5.17 BP5.18 BP5.11 BP5.17 BP5.19 BP5.11 BP6.12 BP5.11 BP6.13 BP6.13 BP6.14 BP6.15 BP6.14 BP6.15 BP6.16 BP6.17 BP6.18 BP6.17 BP6.18 BP6.11	Strategic alliance between (non-competing) partners industry association Co-creation Cost driven (i.e., low cost to manufacture and install) Cost driven (i.e., low cost to manufacture and install) Cost driven (i.e., low cost to manufacture and install) Cost driven (i.e., low cost to manufacture and install) Cost driven (i.e., low maintenance costs) Sale and the driven cost (i.e., low maintenance costs) Sale and take-back guarantee Sale with varrantee Sale with varrantee Sale with deposit Product-sencie system (PSS) For-free Product-lease Product-lease Product-lease Product-lease Product-lease Pay-per-use Use subscription Restribrire Pooling /sharing Trading (fee) Performance lease Pay-per-service Reward system (i.e., bonus-malus points, discount on new purchase) Service subscription Income division in rimit coalitions Income division in rimit coalitions Income division in rimit coalitions Income division over the value chain Building Building components Products (Sub-)-components or parts (i.e.g., for repair or updates) Materials Resources Service (i.e.g., maintenance, advice, connecting, brokering) Consumables Use Performance Component use energy Value through high service / performance / customer experience	1.7,8,10,12,17,21,27,31,32 8 2.3,6,10,11,16-22,28,31,32 31 19 6.10,18,31 3.4,18 30 9 1-6,9-12,17-22,24-27,30-32,34 1,3,5,9,12,18,21,24,32,34 1,3,5,9,12,18,21,24,32,34 1,6,9-2,1,23 1,9,10,12,18,22,27 5,9,10,21,22,32 1,9,10,17-21,24,25,27,30-32,34 1,3,5,9,10,17-21,24,25,27,30-32,34 1,3,5,9,10,17-21,24,25,27,30-32,34 1,3,5,9,11,21,11,11,12,22,24,25,27,30,31,36 21,30 1,3,5,9,11,21,11,12,22,24,25,27,30,31,36 21,30 1,3,5,9,11,21,11,12,22,24,25,30,31 1,3,5,9,11,21,11,12,22,24,25,30,31 1,3,5,9,11,21,11,12,22,24,25,30,31 1,3,5,9,11,21,11,20,22,24,25,30,31 1,3,6,9,12,18,21,22,25 1,3,4,6,10,12,11,12,20,22,31 1,5,9,10,12,11,18,20,22,47,31 1,5,9,10,12,11,18,20,22,47,31 1,5,9,10,12,11,18,20,22,47,31 1,9,10,12,11,12,23,1 1,10,11,12,12,25,1 1,10,11,12,12,25,1 1,10,11,12,12,25,1 1,10,11,12,12,25,1 1,10,11,12,12,25,1 1,10,11,12,12,25,1 1,10,11,12,12,25,1 1,10,11,12,12,25,1 1,10,11,12,12,25,1 1,10,11,12,12,25,1 1,10,11,12,12,25,1 1,10,11,12,12,25,1 1,10,11,12,12,25,1 1,10,11,12,12,12,1 1,10,11,12,12,12,12 1,10,11,12,12,12,12 1,10,11,12,12,12,12 1,10,11,12,12,12,13 1,10,11,12,12,13
		Cost structure	20,22,26- 31,34,36 31,34,36 1-4,6,8,10,17- 22,24-	BP5.1	Cost proposition Financial arrangement Income division	27-29,31,32,34 3,18 1-4,7,10,11,15,17-21,25 28,30-32,34,36 10,19,20,28 1-3,5-7,9,10,12,17-	BP3.43 BP3.44 BP3.45 BP3.46 BP3.47 BP3.48 BP4.12 BP4.13 BP5.15 BP5.12 BP5.13 BP5.16 BP5.17 BP5.17 BP5.11 BP5.17 BP5.11 BP6.11	Strategic alliance between (non-competing) partners industry association Co-creation Co-creation Co-creation Co-creation Building team Joint venture Cost driven (i.e., low cost to manufacture and install) Value driven (i.e., low cost to manufacture and install) Value driven (i.e., low cost to manufacture and install) Low operational cost driven (i.e., low maintenance costs) Sale and take-back guarantee Sale with warrantee Sale and take-back guarantee Sale and toy-back guarantee Sale and buy-back guarantee Sale and buy-back guarantee Value and performance (PSS) For-free Product-service system (PSS) For-free Fo	1.7.8.10.12.17.21.27.31.32 8 8.1.3.6.10.11.16-22.28.31.32 31 19 6.10.18.31 3.4.18 30 9 1-6.9.12.17.22.24.27.30-32.34 1.3.5.9.12.18.21.24.32.34 1.3.5.9.12.18.21.24.32.34 1.3.5.9.12.18.21.24.32.34 1.3.5.9.12.18.21.24.32.34 1.3.5.9.12.18.21.24.32.34 1.3.5.9.12.18.21.24.32.34 1.3.5.9.10.17.18.20.22.24.25.27.28.30.31.36 21.30 2
		Cost structure	20,22,26- 31,34,36 31,34,36 1-4,6,8,10,17- 22,24-	BP5.1	Cost proposition Financial arrangement Income division	27-29,31,32,34 3,18 1-4,7,10,11,15,17-21,25 28,30-32,34,36 10,19,20,28 1-3,5-7,9,10,12,17-	BP34.3 BP3.44 BP3.45 BP3.46 BP3.47 BP3.48 BP3.47 BP3.48 BP4.12 BP4.12 BP4.13 BP5.11 BP5.13 BP5.13 BP5.14 BP5.13 BP5.14 BP5.14 BP5.14 BP5.14 BP5.19 BP5.14 BP5.11 BP	Strategic alliance between (non-competing) partners industry association Co-creation Co-creation Co-creation Building team Joint venture Cost driven (e.g. lov cost for manufacture and install) Value driven (e.g. high residual value, high user value) Low operational cost driven (e.g., low maintenance costs) Sale Sale with warrantee Sale and taby-back guarantee Sale and taby-back guarantee Sale and taby-back guarantee Sale and taby-back guarantee Sale with deposit Product-service system (PSS) For-free Product-service system (PSS) For-free Product-service system (PSS) For-free Payper-sure Use subscription Renthire Pooling /sharing Trading (fee) Performance lease Payper-service Reward system (e.g., bonus-malus points, discount on new purchase) Sanvice subscription Income division in 'min' coalitions Income division over the value chain Building Building components Products Resources Value through less space needed (through demanterialisation) Value through high service / peter platsus (trough demanterialisation) Value through high service / peter prasting or status	1.7.8.10.12.17.21.27.31.32 2.3.6.10.11.16-22.26.31.32 31 19 6.10.16.31 3.4.18 30 9 1-6.9-12.17-22.24-27.30-32.34 1.3.5.9.12.18.22.23 1.3.5.9.12.18.22.23 1.9.10.12.18-22.27 5.9.10.21.22.32 1.9.10.12.18-22.27 5.9.10.21.22.32 1.3.6.9.10.17-21.24.25.27.30-32.34 1.3.5.9.10.17-21.24.25.27.30-32.34 1.3.5.9.10.17-21.24.25.27.30-32.34 1.3.5.9.10.17-21.24.25.27.30-32.34 1.3.5.9.10.17-21.24.25.27.30-32.34 1.3.5.9.10.17-11.21.24.25.27.30-32.34 1.3.5.9.10.17-11.21.24.25.27.30-32 1.3.5.9.10.17-11.21.24.25.27.30-32 1.3.5.9.10.17-11.21.24.25.27.30-32 1.3.5.6.9.10.17.17.18.20.22.24.25.30.31 1.3.5.9.11.21.71.18.20.22.24.25.30.31 1.3.5.9.11.21.71.18.20.22.27.31 5.9.10.12.19.20.22 1.3.4.19.19.20.22 13.19 13.19 13.19.34 1.7.9-13.17-28.30-34 1.3.5.9.12.18.20.22.25.27 1.5.9.12.18.20.22.25.27 1.5.9.12.18.20.22.25.27 1.5.9.12.17.18.20.22.25.27 1.5.9.12.17.18.20.22.25.27 1.5.9.12.17.18.20.22.25.27 1.5.9.12.17.18.20.22.25.27 1.5.9.12.17.18.20.22.25.27 1.5.9.12.17.18.20.22.25.27 1.5.9.12.17.18.20.22.25.27 1.5.9.12.17.18.20.22.25.27
		Cost structure	20,22,26- 31,34,36 31,34,36 1-4,6,8,10,17- 22,24-	BP5.1	Cost proposition Financial arrangement Income division Product / service proposition	27-29,31,32,34 3,18 1-4,7,10,11,15,17-21,25 28,30-32,34,36 10,19,20,28 1-3,5-7,9,10,12,17-28,30-32,34,36	BP3.43 BP3.44 BP3.45 BP3.46 BP3.47 BP3.48 BP3.47 BP3.48 BP4.12 BP4.13 BP5.15 BP5.16 BP5.17 BP	Strategic alliance between (non-competing) partners industry association Co-creation Co-creation Co-creation Co-creation Silviding team Joint venture Cost driven (i.e., low cost to manufacture and install) Value driven (i.e., low cost to manufacture and install) Value driven (i.e., low cost to manufacture and install) Low operational cost driven (i.e., low maintenance costs) Sale and take-back guarantee Sale with warrantee Sale and take-back guarantee Sale and take-back guarantee Sale and back-back guarantee Sale with venture Sale with deposit Product-service system (PSS) For-free Product-service system (pss) Income division per company Income division in 'mini' coalitions Income division in 'mini' coalitions Income division over the value chain Building Building components Products Service (ps., for repair or updates) Materials Resources Service (ps., maintenance, advice, connecting, brokering) Consumables Usue brrough reduction of costs by encouraging sufficiency Value through topic ripid in venture of values Value through topic ripid in venture of values Value through topic replice or status Value through lower lotal cost of ownership (TCO)	1.7,8,10,12,17,21,27,31,32 8 1.3,6,10,11,16-22,28,31,32 31 19 6.10,16,31 3.4,18 30 9 1-6,9-12,17-22,24-27,30-32,34 1.3,5,9,12,18,21,24,32,34 1.3,5,9,12,18,21,24,32,34 1.5,9,12,18,21,24,32,34 1.5,9,12,18,21,24,32,34 1.5,9,12,18,21,24,32,34 1.5,9,12,18,21,24,32,34 1.5,9,12,18,21,24,32,34 1.5,9,12,18,22,27 5,9,10,21,22,32 1.3,5,9,10,17-21,24,25,27,30-32,34 1.3,5,9,11,21,17,18,20,22,24,25,27,38,30,31,36 21,30 1.3,5,9,11,21,17,18,20,22,31 1.3,5,9,11,21,17,18,20,22,31 1.3,5,9,11,21,17,18,20,22,31 1.3,5,9,11,21,17,18,20,22,31 1.5,5,9,10,12,18,12,12,25 1.3,4,6,10,12,17-20,31 1.5,5,9,10,12,18,12,12,25 1.5,10,14,19,20,22 1.5,10,14,19,20,22 1.5,10,14,19,20,22 1.5,10,14,19,20,22 1.5,10,14,19,20,22 1.5,10,14,19,20,22 1.5,10,14,19,20,22 1.5,10,14,19,20,22 1.5,10,14,19,20,22 1.5,10,14,19,20,22 1.5,10,14,19,20,22 1.5,10,14,19,20,22 1.5,10,14,12,10,20,24,27,31 1.5,10,14,17,28,30,35 1.3,4,6,10,12,11,12,20,24,27,31 1.5,10,14,17,28,30,35 1.3,4,6,11,17,18,20,24,27,31 1.5,10,14,17,18,20,24,27,31 1.5,10,17,18,20,24,27,31 1.5,10,12,17,18,20,24,27,31 1.5,10,17,18,20,30,31 1.5,10,17,18,20,30,31 1.5,10,17,18,20,30,31 1.5,10,17,18,20,30,31 1.5,10,17,18,20,30,31 1.5,10,17,18,20,30,31 1.5,10,17,18,20,30,31 1.5,10,17,18,20,30,31 1.5,10,17,18,20,30,31 1.5,10,17,18,20,30,31 1.5,10,17,18,20,30,31 1.5,10,17,18,20,30,31 1.5,10,17,18,20,30,31 1.5,10,17,18,20,30,31 1.5,10,17,18,20,30,31 1.5,10,17,18,20,30,31 1.5,10,17,18,20,30,30 1.5,10,17,18,2
		Cost structure	20,22,26- 31,34,36 31,34,36 1-4,6,8,10,17- 22,24-	BP5.1	Cost proposition Financial arrangement Income division Product / service proposition	27-29,31,32,34 3,18 1-4,7,10,11,15,17-21,25 28,30-32,34,36 10,19,20,28 1-3,5-7,9,10,12,17-	BP34.9 BP3.48 BP3.48 BP3.48 BP3.48 BP3.48 BP3.48 BP3.48 BP3.48 BP4.12 BP4.13 BP4.13 BP5.13 BP5.13 BP5.14 BP5.13 BP5.14 BP5.13 BP5.14 BP5.14 BP5.15 BP5.14 BP5.14 BP5.15 BP5.14 BP	Strategic alliance between (non-competing) partners industry association Co-creation Co-creation Co-creation Building team Joint venture Cost driven (e.g. low cost to manufacture and install) Value driven (e.g., high residual value, high user value) Low operational cost driven (e.g., low maintenance costs) Sale Sale with warrantee Sale and buy-back guarantee Sale and buy-back guarantee Sale and buy-back guarantee Sale and buy-back guarantee Sale with deposit Product-service system (PSS) For-free For-free For-free For-free For-free For-free For-free For-free	1.7.8.10.12.17.21.27.31.32 8 2.3.6.10.11.16-22.28.31.32 31 19 6.10.18.31 3.4.18 30 9 1-6.9-12.17.22.24-27.30-32.34 1.3.5.9.12.18.21.24.32.31 1.5.9.12.18.22.27 5.9.10.21.22.32 1.9.10.12.18-22.27 5.9.10.21.22.32 1.9.10.12.18-22.27 5.9.10.21.23.32 1.9.10.12.18-22.27 5.9.10.21.23.32 1.9.10.12.18-22.27 5.9.10.21.23.32 1.9.10.17.91.21.42.42.52.7.30-32.34 1.3.5.9.11.21.71.18.20.22.31 1.3.5.9.11.21.71.18.20.22.31 1.3.5.9.11.21.71.18.20.22.31 1.3.5.9.11.21.71.18.20.22.31 1.3.5.9.11.21.71.82.02.23.31 1.3.5.9.11.21.71.82.02.23.31 1.3.5.9.11.21.71.82.02.23.31 1.3.5.9.11.21.71.82.02.23.31 1.3.5.9.11.21.71.82.02.23.31 1.3.5.9.11.21.71.82.02.23.31 1.3.5.9.11.21.71.82.02.23.31 1.3.5.9.11.21.72.03.31 1.5.5.9.10.12.71.82.02.27.31 5.9.10.12.71.82.02.27 1.9.10.12.71.82.02.24.27.31 1.9.10.14.71.82.02.24.27.34 1.3.5.9.12.18.20.22.25.77 1.7.9.14.17.28.30.35 1.3.4.6.9.12.22.25.27 1.7.9.14.17.28.30.35 1.3.4.6.9.12.22.25.27,34 1.6.9.12.17.18.20.22.25.27,34 1.6.9.12.17.18.20.22.24.27.31 1.2.18.20.22.25.77,30 1.5.9.12.17.20.22.25.77,30 1.5.9.12.17.20.22.25.77,30 1.5.9.12.17.20.22.25.77,30 1.5.9.12.17.20.22.25.77,30 1.5.9.12.17.20.22.25.77,30 1.5.9.12.17.20.20.27 1.5.9.12.17.20.20.27 1.5.9.12.17.20.20.27 1.5.9.12.17.20.20.27

							BP6.2-12	Value through better life cycle analysis (LCA) / climate performance	5-7,9,10,12,18-22,24,26,28,30
								Value for risk reduction	12,17,18
							BP6.2-14	Value through customisation options	3-7,9,11-13,17,18,20,21,26,30
		Value						Value though upgrade opportunities	5,12,18,20,21
	BP6	proposition	2-10,12,17-					Value through off-balance investment	
	٥	proposition	28,30-34,36				BP6.2-17	Value through lower waste-disposal costs	12,26
		s						Value through higher end-value of building component / product	6,12,18,20,22,27
							BP6.3-1	Value through stable revenue streams	10,12,19,20
	1						BP6.3-2	Value through supply chain interest alignment / collaboration	1,5,9,10,18,20-22,24,27,31,33
	1						BP6.3-3	Value through green reputation for company	9,12,18,20,21
	1						BP6.3-4	Value through becoming market leader	1,24
	1						BP6.3-5	Value through lower risk	1,5,6,9,12,13,18,31,32
	1						BP6.3-6	Value through efficiency by integration of systems (e.g., train-metro)	7,10,18,22,31
	1						BP6.3-7	Lower overall costs	1,5,6,9,10,18,21,33
	1						BP6.3-8	Value through long-term client relations	3,9,10,12,19-21,25,27,31,32
	1						BP6.3-9	Value through increased (process) efficiency	1,8-10,12,18,20,21,27
	1						BP6.3-10	Value through additional / untapped market share and revenue streams	1-3, 5, 8,9,12,18,20,21,25-27,30,31,34
	1						BP6.3-11	Value through lower resource costs	1,5,9,10,12,20,21,26
	1					1-10,12,17-22,24-	BP6.3-12	Value through consistent resource supply	1,3,6,9,12,18,20,21,25,27,31-33
	1			BP6.3	Value capturing		BP6.3-13	Value through less consumption of materials	1,2,5,6,9,10,12,13,21-28,30
	1					28,30,31,34	BP6.3-14	Value through better life cycle analysis (LCA) / climate performance	5-7,9,10,12,18-22,24,26,28,30
								Value through lower logistic costs	8,10,12
								Value through 'premium' cost price or higher margins (for quality product	
	1							Additional revenues from long lifespan of component	1-5,10,12,13,18,20,21,25,26,34
							BP6.3-18	Increased profit from reparability of component / part	1-3,5,10,12,18,20,21,26,27
	1						BP6.3-19	Long-term customer loyalty / lock-in (i.e., repeat sales of consumables)	3,5,6,9,10,12,20,22,25,32
	1							Increased profit from end-value product / part (i.e., reusability)	1-6,9,10,12,18-22,25-27,29,32-34
	1							Increased profit from end-value material (i.e., re-use and recyclability)	1,3-8,10,12,18-22,25-27,29,31,33,34
	1							Increased profit from energy savings	5.7.9.20
	1						BP6.3-23	Increased profit by saving on recycle costs	1,8,9,12,20,21,27,29
Business model	1						BP6.3-24	Value through job / company growth	2,9,12,13,20,21
	1							Higher profit margins through service proposition	1,3,5,9,10,12,18,21,25,27,32
	-						BP7.1-1	Physical resources (i.e., system elements and facilities for activities)	3,6,17,18,21,22,24,26,28,30,31
		Key	2,3,5,6,17- 22,26-28,30- 33,36	BP7.1	Key resources per	2,3,5,6,17-22,26-28,30-	BP7.1-2	Intellectual resources (e.g., partnership / IP / brand)	3,6,17,18,21,22,26,31
ŏ	BP7	-			supply chain partner	33.36	BP7.1-3	Human resources (e.g., skilled / unskilled employees)	3,6,17,18,26,31,36
Ε	1	resources			supply chain partner		BP7.1-4	Financial resources (e.g., cash / finance capacity)	3,6,17,21,26,31
0	-						BP8.1-1	Online (re)store	1,2,9,10,12,18,20,21,31
κ̈Ι	1				Sale and (re)loop 1 channels		BP8.1-2	Customer community	3,31
<u>e</u>	1		2,3,6,8,10,17-				BP8.1-3	Post-purchase customer support	3.31
Ħ	1			BP8.1			BP8.1-4	Online (second hand) marketplace or platform	1,3,5,6,9-12,18-22,26,27,31,32,34
<u> </u>	BD8	Channels				2,3,6,8,10,17-22,26-	BP8.1-5	(Re)store	3,5,9,10,12,16,18,21,22,24,31,35
ក	۰ تا	Onamicis	28,31,33,34,36			28,31,33,34,36	BP8.1-6	On phone sale	0,0,0,10,12,10,10,21,22,24,01,00
_			20,31,33,34,30				BP8.1-7	Online repair site	32
							BP8.1-8	(Social) media advertisement	20
							BP8.1-9	(Social media) sales team or influencers	20
							BP9.1-1	(Nation wide) collection points	5,10,12,21,32
		Take back	1,2,4-6,9,10,			1,2,4-6,9,10, 12,16,18- 21,23-27,32,34,36	BP9.1-1	At home pick-up	9,12,18,32
	BP9		12,16,18-21,	BP9.1	Facilities for take-back		BP9.1-3	In store drop-off	9.12.21
		systems	23-27,32,34,36	3		2.,20-21,02,04,30	BP9.1-5	Postal return	9.12
							D1 011 0	Circular leadership present	1,4,18-20,28
								Work from circular ambitions for a project and process	19.33
								Expertise for developing and implementing circular innovations	6,7,9,18-21,24,25,28,31-33
								Need for change (in society and businesses)	2,18,20,21,25,28,30
								CE concept accepted by society	13,17,20,21
									13,17,20,21
							BP10.1-6 BP10.1-7	Consistency in / long-term commitment by the supply chain partners	13.50
								Trust between supply chain partners	1,9,10,18,19,22,31 4,9,10,13,17-20,22-25,28
		Adoption	2,6-9,12,13,18-	ВР	Circular business model	2,6-9,12,13,18-		Supply chain acceptance and motivation	
	BP1	0						Certainty of benefit for supply chain partners	1,2,9,17-20,22,24,32
		factors	22,24,25,32,34	10.1	adoption factors	22,24,25,32,34		Supply chain alignment or collaboration possible	4,9,10,18-20,22,24,25,27,28
								Customer is aware of circular offer	4,18,23,26,30,31
								Customer acceptance and demand	2,3,9,10,11,18,20-26,30,31,34
								Customer behaviour	4,7,9-11,20,21,28,30-33
								Political acceptence	6,20
									2,5,6,8-10,12,13,15,17,18,20,21,24-26,28,30,32
								Driving policy and legislation	
							BP10.1-16	Resource availability	2,9,18,20,21,24,26,28
							BP10.1-16 BP10.1-17		

Legend sources

1	(Achterberg et al., 2016)	19	(Leising et.al, 2018)
2	(Antikainen and Valkokari, 2016)	20	(Lewandowski, 2016)
3	(Bakker et al., 2014)	21	(Lüdeke-Freund et al., 2018)
4	(Balkenende and Bakker, 2015)	22	(Mentink, 2014)
5	(Bocken et al., 2016)	23	(Mestre and Cooper, 2017)
6	(Ellen MacArthur Foundation and IDEO, 2017)	24	(Mendoza et al., 2017) and (Heyes, et al., 2018)
7	(Ellen MacArthur Foundation, 2015)	25	(Moreno, et al., 2016)
8	(Ellen MacArthur Foundation, 2013)	26	(Nussholz, 2017)
9	(Evans and Bocken, 2014) and (Evans and Bocken, 2013)	27	(Nußholz, 2017)
10	(Fischer and Achterberg, 2016)	28	(De Pádua Pieroni et al., 2018)
11	(Forum for the Future and Novelis, n.d.)	29	(Poppelaars, 2014)
12	(Forum for the Future and Unilever, n.d.)	30	(Scheepens, et al., 2016)
13	(Geldermans, 2016)	31	(Sempels, 2014)
14	(Gerritsen, 2015)	32	(The Great Recovery and RSA, 2013)
15	(Gispen, n.d.)	33	(Toxopeus et al., 2018)
16	(Goldsworthy, 2017)	34	(van Dam et al., 2017)
17	(Hofmann et al., 2017)	35	(van den Berg and Bakker, 2015)
18	(Joustra et al., 2013)	36	(WIITHAA, n.d.)