

SUPPLEMENTARY INFORMATION

Table A 1: List of the 29 tools analysed in this study. Each tool is identified by a number. The table includes tools' name (attributed by the author of this study if no official name is available), year of release, sector of application, main objective, assessment structure, target user, developers, and reference. Tools specifically developed for AdMa assessment show their sector of application highlighted.

Number	Tool name	Release year	Sector of application	Objective	Assessment structure	Target user	Developers	References
1	AdMa_overview	2020	AdMa	To provide an overview of advanced materials and potential needs to act on chemical safety.	set of aspects or indicators or criteria or parameters	regulators or national authorities or general decision-makers	German Environment Agency	(18)
2	AdMaCat	2024	AdMa	AdMaCat can assist in identifying data gaps and inform decisions regarding the design of tailored AdMa by optimizing the balance of functionality, safety, and sustainability in a circular economy.	questionnaire	enterprises/industries of any dimensions/any kind of organization/or sustainability appliers	Department of Environmental and Resource Engineering, Technical University of Denmark Tecnológico de Monterrey, Escuela de Ingeniería y Ciencias	(19)

Number	Tool name	Release year	Sector of application	Objective	Assessment structure	Target user	Developers	References
3	Agent_network	2007	Nanomaterials	To analyse agent network for sustainable governance of emerging technologies	set of aspects or indicators or criteria or parameters	innovators	Institute for Environmental Decisions, Natural and Social Science Interface, ETH Zurich, CHN, 8092 Zurich, Switzerland	(20)
4	Australian_impact_analysis	2023	Emerging problems or new proposals	To develop a guide for impact analysis (a preliminary assessment form)	set of aspects or indicators or criteria or parameters	regulators or national authorities or general decision-makers	OIA (Office of Impact Analysis) Australian Government	(21)
5	CENARIOS®	2007	Nanomaterials	CENARIOS® represents the World's First Certifiable Risk Management and Monitoring System for Nanotechnologies	questionnaire	enterprises/industries of any dimensions/any kind of organization/or sustainability appliers	the Innovation Society Ltd. (St. Gallen, Switzerland) and TÜV SÜD (Munich, Germany)	(22)
6	Early4AdMa	2023	AdMa	Pre-regulatory risk governance tool. The outcome should help regulatory decision makers to take action so that potential issues posed by advanced materials can be addressed at an early stage.	questionnaire	regulators or national authorities or general decision-makers	Developed by RIVM and further communicated by the OECD advanced materials group	(23)

Number	Tool name	Release year	Sector of application	Objective	Assessment structure	Target user	Developers	References
7	ECHA_SEA	2008	Chemicals	To evaluate what costs and benefits an action related to chemicals restriction will create for society (analyse proposed restrictions)	set of aspects or indicators or criteria or parameters	enterprises/industries of any dimensions/any kind of organization/or sustainability appliers	European Chemicals Agency (drafted and discussed within the REACH Implementation Projects led by the European Commission services)	(24)
8	Global Social Compliance Programme 1	2010	Sector-independent	To develop a framework of reference requirements as a reference tool for employment sites across the whole supply chain. The Reference requirements reflect the need to comply with existing local, national and international legislation and provide a common understanding of good environmental practice.	framework or guideline	enterprises/industries of any dimensions/any kind of organization/or sustainability appliers	Global Social Compliance Programme facilitated by The Consumer Goods Forum	(25)
9	Global Social Compliance Programme 2	2013	Sector-independent	To provide a general overview of the management system (MS) approach that can help a Supplier to consistently improve its level of social compliance and to provide the Supplier with best practice elements of an effective social and labour policy management system, which can be integrated with other management functions to promote continuous improvement.	framework or guideline	enterprises/industries of any dimensions/any kind of organization/or sustainability appliers	Global Social Compliance Programme facilitated by The Consumer Goods Forum	(26)

Number	Tool name	Release year	Sector of application	Objective	Assessment structure	Target user	Developers	References
10	Global Social Compliance Programme 3	2013	Sector-independent	To support buying organisations in monitoring and improving social compliance performance in the whole supply chain.	framework or guideline	enterprises/industries of any dimensions/any kind of organization/or sustainability appliers	Global Social Compliance Programme facilitated by The Consumer Goods Forum	(27)
11	Green Chemistry Nanotechnology	2016	Nanomaterials	To develop a mainly qualitative (but also quantitative) guidance and principles for developing safer and more sustainable nanomaterials and nano-enabled products	framework or guideline	innovators	Department of Chemistry and Biochemistry and Materials Science Institute, University of Oregon	(28)
12	GRI Standards	2022	Sector-independent	To guide sustainability reporting	set of aspects or indicators or criteria or parameters	enterprises/industries of any dimensions/any kind of organization/or sustainability appliers	Global Sustainability Standards Boars (GSSB)	(29)
13	ISA_chemicals	2015	Chemicals	To develop a holistic methodology that enables the evaluation and comparison of process sustainability in an integrated system.	set of aspects or indicators or criteria or parameters	enterprises/industries of any dimensions/any kind of organization/or sustainability appliers	School of Environment and Safety Engineering, Qingdao University of Science and Technology, Qingdao 266042, China and School of Chemistry and Chemical Engineering, South China University of Technology, Guangzhou 510640, China	(17)

Number	Tool name	Release year	Sector of application	Objective	Assessment structure	Target user	Developers	References
14	ivl_LCBROM	2025	Sector-independent	To provide a screening sustainability assessment for chemicals, materials or processes	questionnaire	innovators	IVL Svenska Miljöinstitutet	(30)
15	JRC-SSbD framework	2022	Chemicals	To guide the development of chemicals and materials that are both safe for human health and the environment and sustainable throughout their life cycle, from production to disposal.	set of aspects or indicators or criteria or parameters	innovators	JRC	(1)
16	LICARA InnovationSCAN	2021	Nanomaterials	To provide a pro-active approach towards the elimination and mitigation of potential risks and thus ensures sustainable development of the devices along their innovation value chain	questionnaire	enterprises/industries of any dimensions/any kind of organization/or sustainability appliers	Empa and TNO	(31)
17	LICARA NanoSCAN	2014	Nanomaterials	To guide SMEs through their decision-making processes regarding new nanoproducts, but also to re-evaluate existing nanoproducts in order to improve them.	questionnaire	enterprises/industries of any dimensions/any kind of organization/or sustainability appliers	Empa, TNO and university of Zurich	(32)

Number	Tool name	Release year	Sector of application	Objective	Assessment structure	Target user	Developers	References
18	NanoRiskCat	2011	Nanomaterials	To identify, categorize and rank exposures and effects of nanomaterials used in consumer products based on data available in the peer-reviewed scientific literature and other regulatory relevant sources of information and data. The primary focus was on nanomaterials relevant for professional end-users and consumers as, as well as nanomaterials released into the environment. The wider goal of NanoRiskCat is to help manufacturers, down-stream end-users, regulators and other stakeholders to evaluate, rank and communicate the potential for exposure and effects through a tiered approach in which the specific applications of a given nanomaterial are evaluated.	questionnaire	enterprises/industries of any dimensions/any kind of organization/or sustainability appliers	DTU Environment and the National Research Centre for the Working Environment	(33).
19	NGRA framework	2024	AdMa	To applying New Approach Methodologies (NAMs) for safe by design and regulatory risk assessment of advanced nanomaterials (AdNMs).	set of aspects or indicators or criteria or parameters	innovators	see paper authors	(34)
20	SAFA FAO	2012	Food and agriculture	To support sustainable development of the food and agriculture sector, from primary production in agriculture, forestry and fisheries, through manufacturing and to the point of sale to the consumer to ensure human rights and well-being	set of aspects or indicators or criteria or parameters	enterprises/industries of any dimensions/any kind of organization/or sustainability appliers	The Natural Resources Management and Environment Department of FAO	(35)

Number	Tool name	Release year	Sector of application	Objective	Assessment structure	Target user	Developers	References
				without depleting or diminishing the capacity of Earth's ecosystems to support life now or for future generations.				
21	Screening MCDA NANORIGO	2023	Sector-independent	To develop a set of weighted criteria for use in a stochastic multicriteria analysis to support decision-making for a broad range of societal stakeholders and to improve the assessment of new materials beyond a characterization of the risks to the environment and human health. To assess dealing with non-knowledge and derive assumptions about the behaviour of the product and its impact on affected systems	set of aspects or indicators or criteria or parameters	enterprises/industries of any dimensions/any kind of organization/or sustainability appliers	Developed within NANORIGO project	(36)
22	SLCA exploration	2008	Sector-independent	To explain how to incorporate the social dimension of sustainability into business decision-making	set of aspects or indicators or criteria or parameters	enterprises/industries of any dimensions/any kind of organization/or sustainability appliers	Department of Mechanical Engineering–Engineering Mechanics, Sustainable Futures Institute, Michigan Technological University, USA	(37)

Number	Tool name	Release year	Sector of application	Objective	Assessment structure	Target user	Developers	References
23	SMM	2015	Nanomaterials	To develop an inclusion in the assessments, not only of human health and environmental risks, but also of aspects related to sustainable materials management.	set of aspects or indicators or criteria or parameters	regulators or national authorities or general decision-makers	Department of Technological Design and Development, Faculty of Production Engineering, University of Bremen, Badgasteiner and ARTEC – Research Center for Sustainability Studies.	(38)
24	Societal Incubator	2015	Nanomaterials	To offer the opportunity to organise a collective action or learning process to accelerate responsible innovation and increase the chances of social success of nanotechnology.	framework or guideline	enterprises/industries of any dimensions/any kind of organization/or sustainability appliers	Rathenau Instituut	(39)
25	Socio_economic_SSbD	2022	AdMa	To develop an innovative semi-quantitative methodology to socio-economic assessment of (advanced) engineered nanomaterials and nano-enabled products (NEPs) to support safe-and-sustainable-by-design (SSbD) decision making by industries in the early stages of product development.	set of aspects or indicators or criteria or parameters	enterprises/industries of any dimensions/any kind of organization/or sustainability appliers	see paper authors	(40)

Number	Tool name	Release year	Sector of application	Objective	Assessment structure	Target user	Developers	References
26	SUNRISE_WP3 (SUNRISE project)	2025	AdMa	To provide a refined set of questions indicators spanning environmental, social, and economic dimensions, and structured to reflect both product- and company-specific considerations across different life-cycle stages.	questionnaire	enterprises/industries of any dimensions/any kind of organization/or sustainability appliers	Developed within SUNRISE project	(41)
27	SUNSHINE_TIER_1 (SUNSHINE project)	2023	Nanomaterials	To evaluate the safety, functionality and sustainability in the early R&D stages of the lifecycle of chemicals and materials for a transition to a SSbD approach to chemicals	questionnaire	enterprises/industries of any dimensions/any kind of organization/or sustainability appliers	Developed within SUNSHINE project	(7)
28	UNEP categories	2020	Sector-independent	To help conducting S-LCA studies and to provide detailed information on each of the subcategories introduced in the Guidelines organized by stakeholder category.	set of aspects or indicators or criteria or parameters	enterprises/industries of any dimensions/any kind of organization/or sustainability appliers	UNEP	(42)

Number	Tool name	Release year	Sector of application	Objective	Assessment structure	Target user	Developers	References
29	WASP (HARMLESS project)	2025	AdMa	To guide innovators in developing SSbD AdMa, by facilitating the assessment of most SSbD dimensions and visualizing the results in a comprehensive, yet detailed way, enabling their own balancing of SSbD benefits and trade-offs.	questionnaire	innovators	Developed within HARMLESS project	(43)

Table A 2: Dimensions assessed in each analysed tool. The analysis is qualitative and subjective. Yellow indicates that the dimension is partially addressed, meaning that more than one aspect of the dimension is considered, but not in a comprehensive or exhaustive manner. Light blue indicates that only a single, specific aspect of the dimension is (exhaustively or not exhaustively) addressed, without broader coverage. Purple means the dimension is the main focus/assessment purpose of the tool (probably related to a singular specific-dimension tool). Green means the dimension is well treated. Light green means the dimension is treated but less in comparison with the other dimension treated by the same tool (the difference is not quantified). Red means the dimension is not considered. The first column reports the number of the assessed tools as described in Table A 1.

DIMENSION							
Tool	Safety	Environmental sustainability	Economic sustainability	Social sustainability	Regulation	Functionality	Governance
1							
2	Yellow	Purple					
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Table A 3: Examples of research team interventions to correct inappropriate AI categorisation. The modifications are grouped according to the type of intervention required.

Inappropriate categorisation	Indicator	AI indicators' category	Final indicators' category	Tool
Example of wrong understanding	Wastewater	Water Pollution	Waste production and management	Screening MCDA NANORIGO
	Does the manufacturing process lead to emissions of ozone depleting gases?	Emissions	Ozone depletion	AdMaCat
	ozone depletion potential (ODP)	Climate Change	Ozone depletion	ISA_chemicals
	Direct costs of end-of-life	Direct Costs	Waste management costs	TIER1B_SUNSHINE
	Waste disposal	Direct Costs	Waste production and management	SAFA_FAO
	Critical materials	Resource Efficiency	Critical materials	TIER1B_SUNSHINE
	Use of raw materials derived from renewable resources	Resource Efficiency	Renewable resources	TIER1B_SUNSHINE
	Eutrophication potential (EP)	Water Pollution	Eutrophication	ISA_chemicals
	Total turnover and employment for affected companies/industries	Revenue and Profitability	Employment	ECHA_SEA
	Landscape/aesthetic quality of environment	Other Environmental Impacts	Land Consumption	ECHA_SEA
	Presence of a written contract which defines the relationship between the employers and workers (rights and responsibilities of each)	Labour Force	Worker rights	UNEP_categories
	Change in inspection and monitoring costs (e.g. of imports, of emissions, etc.)	Emissions	Other costs	ECHA_SEA
	Cost difference in case of relocation of production (costs of establishing production facilities, cost of raw materials, transport	Geographical Impact	Capital costs	ECHA_SEA

Inappropriate categorisation	Indicator	AI indicators' category	Final indicators' category	Tool
	costs etc)			
Example of too specific indicators' categories grouped by the research team into a broader one	Organization efforts to strengthen community health (e.g. through shared community access to organization health resources)	Health and Safety	Impacts on local communities	UNEP_categories
	Do policies related to intellectual property respect moral and economic rights of the community	Intellectual Property Rights	Impacts on local communities	UNEP_categories
	Days and months without sufficient food in past year	Food Security	Impacts on local communities	UNEP_categories
Example of a too generic indicators' category refined into more specific ones	Direct costs of end-of-life	Direct Costs	Waste management costs	TIER1B_SUNSHINE
	Direct costs of installation (heating, lighting) for manufacturing	Direct Costs	Manufacturing costs	TIER1B_SUNSHINE

Table A 4: List of 92 indicators' categories, showing the total number of occurrences and the number of distinct tools in which each indicators' category is mentioned, ordered by decreasing tools per indicators' category. The eleven functionality indicators' categories, derived from the initial "Functionality" one, were excluded, as reported in Table A 5.

Indicators' category	Total Occurrences	Number of tools per indicators' category
Waste production and management	37	12
Employment	34	12
Innovation and R&D	22	12
Emissions	42	11
Market dimension and Application Potential	27	11
Resource Efficiency	15	11
Energy Consumption	20	10
Supply chain traceability	27	9
Impacts on local communities	25	9
Circular Economy	33	8
Work Fairness	28	8
Workplace Conditions	21	8
Water Consumption	19	8
Consumer Benefits	15	8
Climate Change	13	8
Critical materials	8	8
Data management and Transparency	15	7
Social improvement	14	7
Wages and Salaries	10	7
Corporate Social Responsibility	57	6
Other costs	30	6
Manufacturing costs	19	6
Animal Welfare	13	6
Indigenous Rights	9	6
Chemical/material within the scope of available legislations	25	5
Worker Rights	22	5
Occupational safety	19	5
Use costs	18	5
Eco-Toxicity	13	5
Consumer Health and Safety	8	5
Child Labour	8	5
Soil Quality	8	5
Healthcare Access	6	5
Ozone depletion	6	5
Conflicts Management	5	5
Process Optimization	5	5
Forced Labour	5	5
Child Welfare	12	4
Revenues	11	4
Environmental exposure, fate, stability and transformation	11	4

Indicators' category	Total Occurrences	Number of tools per indicators' category
Capacity building	9	4
Economic Benefits	8	4
Hazardous substances or materials	8	4
Land Consumption	6	4
Poverty Alleviation	6	4
Air Quality	5	4
Conflict-Free Sourcing	5	4
Environment resilience and vulnerability	4	4
Stakeholders Engagement	20	3
Persistent, bioaccumulative and toxic	7	3
Biodiversity	7	3
Waste management costs	6	3
Education Access	6	3
Eutrophication	5	3
Materials costs	3	3
Labour Impact	7	2
Maintenance costs	6	2
Human Toxicity	5	2
Criminality	5	2
Contribution to SDGs	4	2
Capital costs	4	2
Personnel costs	4	2
Packaging optimization	4	2
Cultural Heritage Protection	4	2
Sexual harassment	4	2
Support to vulnerable people	3	2
Transportation costs	2	2
Water Pollution	2	2
Renewable resources	2	2
Housing Quality	2	2
Violation of regulations	2	2
End-of-life information	2	2
Recognised techniques for characterisation and exposure estimation	3	1
Resource Independence	3	1
Renewable Energy	2	1
Food quality and safety	2	1
Agricultural Productivity	2	1
Remediation of contamination activities/sites	1	1
Asset integrity and critical incident management	1	1
Cost-effectiveness	1	1
Geographical Accessibility of the Product	1	1
Manufacturing Comparison	1	1

Indicators' category	Total Occurrences	Number of tools per indicators' category
Diversity of technological options	1	1
Community Resilience	1	1
Habitat diversity and connectivity	1	1
Migrant Labour	1	1
Process scalability	1	1
Use of bio-based materials	1	1
Company governance	1	1
Infrastructure Management	1	1
Migrant Integration	1	1
Water acidification	1	1

Table A 5: Indicators' category and their relative occurrences per dimension. The number of dimensions in which each indicator is included is reported in the last column. Cells in grey are those with 0 occurrence for the indicators' category within a specific dimension.

Indicators' category	Environmental sustainability dimension	Social sustainability dimension	Economic sustainability dimension	Functionality dimension	Regulation dimension	Governance dimension	Total Occurrences	Number of dimensions per indicators' category
Contribution to SDGs	1	2	1	0	0	0	4	3
Energy Consumption	20	0	0	0	0	0	20	1
Resource Efficiency	15	0	0	0	0	0	15	1
Climate Change	13	0	0	0	0	0	13	1
Emissions	42	0	0	0	0	0	42	1
Functionality	9	25	7	16	0	0	57	4
Environment resilience and vulnerability	4	0	0	0	0	0	4	1
Innovation and R&D	1	11	10	0	0	0	22	3
Market dimension and Application Potential	1	4	22	0	0	0	27	3
Revenues	0	0	11	0	0	0	11	1
Economic Benefits	0	0	8	0	0	0	8	1
Social improvement	1	13	0	0	0	0	14	2
Occupational safety	0	19	0	0	0	0	19	1
Consumer Health and Safety	0	8	0	0	0	0	8	1
Healthcare Access	0	6	0	0	0	0	6	1
Employment	0	31	3	0	0	0	34	2
Persistent, bioaccumulative and toxic	7	0	0	0	0	0	7	1

Indicators' category	Environmental sustainability dimension	Social sustainability dimension	Economic sustainability dimension	Functionality dimension	Regulation dimension	Governance dimension	Total Occurrences	Number of dimensions per indicators' category
Circular Economy	31	0	2	0	0	0	33	2
Critical materials	8	0	0	0	0	0	8	1
Eco-Toxicity	13	0	0	0	0	0	13	1
Hazardous substances or materials	7	1	0	0	0	0	8	2
Data management and Transparency	0	13	1	0	1	0	15	3
Environmental exposure, fate, stability and transformation	11	0	0	0	0	0	11	1
Chemical/material within the scope of available legislations	1	6	0	0	18	0	25	3
Recognised techniques for characterisation and exposure estimation	0	0	0	0	3	0	3	1
Waste production and management	36	1	0	0	0	0	37	2
Land Consumption	6	0	0	0	0	0	6	1
Ozone depletion	6	0	0	0	0	0	6	1
Water Consumption	18	1	0	0	0	0	19	2
Conflicts Management	0	4	0	0	0	1	5	2
Consumer Benefits	0	13	2	0	0	0	15	2
Process Optimization	3	0	2	0	0	0	5	2
Use costs	0	2	16	0	0	0	18	2

Indicators' category	Environmental sustainability dimension	Social sustainability dimension	Economic sustainability dimension	Functionality dimension	Regulation dimension	Governance dimension	Total Occurrences	Number of dimensions per indicators' category
Manufacturing costs	0	0	19	0	0	0	19	1
Air Quality	5	0	0	0	0	0	5	1
Biodiversity	7	0	0	0	0	0	7	1
Labour Impact	0	7	0	0	0	0	7	1
Workplace Conditions	0	21	0	0	0	0	21	1
Child Labour	0	8	0	0	0	0	8	1
Capital costs	0	0	4	0	0	0	4	1
Other costs	0	0	29	0	0	1	30	2
Materials costs	0	0	3	0	0	0	3	1
Transportation costs	0	0	2	0	0	0	2	1
Maintenance costs	0	0	6	0	0	0	6	1
Waste management costs	0	0	6	0	0	0	6	1
Personell costs	0	0	4	0	0	0	4	1
Forced Labour	0	5	0	0	0	0	5	1
Soil Quality	8	0	0	0	0	0	8	1
Supply chain traceability	0	15	12	0	0	0	27	2
Wages and Salaries	0	10	0	0	0	0	10	1
Water Pollution	2	0	0	0	0	0	2	1
Work Fairness	0	28	0	0	0	0	28	1
Worker Rights	0	22	0	0	0	0	22	1
Remediation of contamination activities/sites	1	0	0	0	0	0	1	1

Indicators' category	Environmental sustainability dimension	Social sustainability dimension	Economic sustainability dimension	Functionality dimension	Regulation dimension	Governance dimension	Total Occurrences	Number of dimensions per indicators' category
Asset integrity and critical incident management	1	0	0	0	0	0	1	1
Corporate Social Responsibility	3	40	2	0	0	12	57	4
Indigenous Rights	0	9	0	0	0	0	9	1
Impacts on local communities	0	25	0	0	0	0	25	1
Eutrophication	5	0	0	0	0	0	5	1
Human Toxicity	5	0	0	0	0	0	5	1
Child Welfare	0	12	0	0	0	0	12	1
Animal Welfare	4	9	0	0	0	0	13	2
Cost-effectiveness	0	1	0	0	0	0	1	1
Geographical Accessibility of the Product	0	0	1	0	0	0	1	1
Renewable Energy	2	0	0	0	0	0	2	1
Packaging optimization	4	0	0	0	0	0	4	1
Manufacturing Comparison	1	0	0	0	0	0	1	1
Diversity of technological options	0	1	0	0	0	0	1	1
Resource Independence	0	3	0	0	0	0	3	1
Community Resilience	0	1	0	0	0	0	1	1
Capacity building	0	9	0	0	0	0	9	1

Indicators' category	Environmental sustainability dimension	Social sustainability dimension	Economic sustainability dimension	Functionality dimension	Regulation dimension	Governance dimension	Total Occurrences	Number of dimensions per indicators' category
Habitat diversity and connectivity	1	0	0	0	0	0	1	1
Renewable resources	2	0	0	0	0	0	2	1
Stakeholders Engagement	0	19	0	0	0	1	20	2
Support to vulnerable people	0	3	0	0	0	0	3	1
Food quality and safety	0	0	2	0	0	0	2	1
Criminality	0	5	0	0	0	0	5	1
Education Access	0	6	0	0	0	0	6	1
Housing Quality	0	2	0	0	0	0	2	1
Poverty Alleviation	0	6	0	0	0	0	6	1
Conflict-Free Sourcing	0	5	0	0	0	0	5	1
Migrant Labour	0	1	0	0	0	0	1	1
Violation of regulations	0	2	0	0	0	0	2	1
Process scalability	0	0	0	1	0	0	1	1
Use of bio-based materials	1	0	0	0	0	0	1	1
Company governance	0	1	0	0	0	0	1	1
Infrastructure Management	0	1	0	0	0	0	1	1
Agricultural Productivity	0	2	0	0	0	0	2	1
Cultural Heritage Protection	0	4	0	0	0	0	4	1

Indicators' category	Environmental sustainability dimension	Social sustainability dimension	Economic sustainability dimension	Functionality dimension	Regulation dimension	Governance dimension	Total Occurrences	Number of dimensions per indicators' category
End-of-life information	0	2	0	0	0	0	2	1
Migrant Integration	0	1	0	0	0	0	1	1
Sexual harassment	0	4	0	0	0	0	4	1
Water acidification	1	0	0	0	0	0	1	1

Table A 6: The eleven “Functionality” indicators’ categories ordered by decreasing number of tools per indicators’ category. The corresponding total occurrences for each indicator within the emerging functionality dimension are also reported.

Functionality indicators’ category	Total occurrences	Number of tools per “Functionality” indicators’ category
Durability	9	8
Consumer needs	8	4
Social benefits	10	3
Additional functions	5	3
Reliability	4	2
Efficiency	2	2
End-of-life	2	2
Useability	2	2
Utility	3	1
Maintenance	1	1
Versatility	1	1

