Sangwon Suh

List of Publications by Year
in descending order

159 papers	18,911 citations	28736 57 h-index	13635 134 g-index
170 all docs	170 docs citations	170 times ranked	17500 citing authors

#	Article	IF	Citations
1	Accelerating the pace of ecotoxicological assessment using artificial intelligence. Ambio, 2022, 51, 598-610.	2.8	12
2	Quantity and fate of synthetic microfiber emissions from apparel washing in California and strategies for their reduction. Environmental Pollution, 2022, 298, 118835.	3.7	13
3	Functionalityâ€based life cycle assessment framework: An information and communication technologies (ICT) product case study. Journal of Industrial Ecology, 2022, 26, 782-800.	2.8	1
4	Environmental trade-offs of direct air capture technologies in climate change mitigation toward 2100. Nature Communications, 2022, 13, .	5.8	35
5	Evaluation of resource use in the household lighting sector in Malaysia considering land disturbances through mining activities. Resources, Conservation and Recycling, 2021, 166, 105343.	5.3	5
6	Method to decompose uncertainties in LCA results into contributing factors. International Journal of Life Cycle Assessment, 2021, 26, 977-988.	2.2	6
7	Non-linearity in Marginal LCA: Application of a Spatial Optimization Model. Frontiers in Sustainability, 2021, 2, .	1.3	5
8	Achieving net-zero greenhouse gas emission plastics by a circular carbon economy. Science, 2021, 374, 71-76.	6.0	222
9	Economic disparity among generations under the Paris Agreement. Nature Communications, 2021, 12, 5663.	5.8	2
10	Lifecycle cost and carbon implications of residential solar-plus-storage in California. IScience, 2021, 24, 103492.	1.9	2
11	How large is the global living wage gap and the price increase needed to close it?. Socio-Economic Review, 2020, 18, 555-574.	2.0	1
12	Mitigating Curtailment and Carbon Emissions through Load Migration between Data Centers. Joule, 2020, 4, 2208-2222.	11.7	35
13	Degradation Rates of Plastics in the Environment. ACS Sustainable Chemistry and Engineering, 2020, 8, 3494-3511.	3.2	1,463
14	Perceived uncertainties of characterization in LCA: a survey. International Journal of Life Cycle Assessment, 2020, 25, 1846-1858.	2.2	16
15	The carbon footprint of the carbon feedstock CO₂. Energy and Environmental Science, 2020, 13, 2979-2992.	15.6	110
16	Synthetic microfiber emissions to land rival those to waterbodies and are growing. PLoS ONE, 2020, 15, e0237839.	1.1	54
17	Closing yield gap is crucial to avoid potential surge in global carbon emissions. Global Environmental Change, 2020, 63, 102100.	3.6	39
18	A review of methods for characterizing the environmental consequences of actions in life cycle assessment. Journal of Industrial Ecology, 2020, 24, 815-829.	2.8	21

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19	Do we have enough natural sand for lowâ€carbon infrastructure?. Journal of Industrial Ecology, 2020, 24, 1004-1015.	2.8	24
20	Life-cycle environmental implications of Chinaâ€™s ban on post-consumer plastics import. Resources, Conservation and Recycling, 2020, 156, 104699.	5.3	30
21	Pesticide application rates and their toxicological impacts: why do they vary so widely across the U.S.?. Environmental Research Letters, 2020, 15, 124049.	2.2	4
22	The Effects of Incorporating Non-linearity in LCA: Characterizing the Impact on Human Health. Frontiers in Sustainability, 2020, 1, .	1.3	6
23	Economic feasibility of recycling rare earth oxides from end-of-life lighting technologies. Resources, Conservation and Recycling, 2019, 150, 104432.	5.3	30
24	Health risks of chemicals in consumer products: A review. Environment International, 2019, 123, 580-587.	4.8	60
25	Climate change mitigation potential of carbon capture and utilization in the chemical industry. Proceedings of the National Academy of Sciences of the United States of America, 2019, 116, 11187-11194.	3.3	384
26	Uncertainty Implications of Hybrid Approach in LCA: Precision versus Accuracy. Environmental Science & Technology, 2019, 53, 3681-3688.	4.6	30
27	Strategies to reduce the global carbon footprint of plastics. Nature Climate Change, 2019, 9, 374-378.	8.1	635
28	OrganoRelease â€“ A framework for modeling the release of organic chemicals from the use and post-use of consumer products. Environmental Pollution, 2018, 234, 751-761.	3.7	15
29	Geographic variability of agriculture requires sector-specific uncertainty characterization. International Journal of Life Cycle Assessment, 2018, 23, 1581-1589.	2.2	23
30	Does the use of pre-calculated uncertainty values change the conclusions of comparative life cycle assessments? â€“ An empirical analysis. PLoS ONE, 2018, 13, e0209474.	1.1	8
31	Linking Exposure and Kinetic Bioaccumulation Models for Metallic Engineered Nanomaterials in Freshwater Ecosystems. ACS Sustainable Chemistry and Engineering, 2018, 6, 12684-12694.	3.2	19
32	Environmental governance in China: Interactions between the state and â€œnonstate actorsâ€. Journal of Environmental Management, 2018, 220, 126-135.	3.8	63
33	Neuro-marketing Tools for Assessing the Communication Effectiveness of Life Cycle Based Environmental Labellingâ€"Procedure and Methodology. , 2018, , 163-173.		4
34	Identifying critical supply chain paths and key sectors for mitigating primary carbonaceous PM_{2.5} mortality in Asia. Economic Systems Research, 2017, 29, 105-123.	1.2	45
35	Cause-effect analysis for sustainable development policy. Environmental Reviews, 2017, 25, 358-379.	2.1	11
36	Pre-calculated LCIs with uncertainties revisited. International Journal of Life Cycle Assessment, 2017, 22, 827-831.	2.2	16

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37	Assessing the Risk of Engineered Nanomaterials in the Environment: Development and Application of the nanoFate Model. Environmental Science & Technology, 2017, 51, 5541-5551.	4.6	205
38	Dynamic Model for the Stocks and Release Flows of Engineered Nanomaterials. Environmental Science & Technology, 2017, 51, 12424-12433.	4.6	58
39	The role of primary processing in the supply risks of critical metals. Economic Systems Research, 2017, 29, 335-356.	1.2	23
40	Rapid Life-Cycle Impact Screening Using Artificial Neural Networks. Environmental Science & Technology, 2017, 51, 10777-10785.	4.6	67
41	Modeling human health characterization factors for indoor nanomaterial emissions in life cycle assessment: a case-study of titanium dioxide. Environmental Science: Nano, 2017, 4, 1705-1721.	2.2	11
42	What distribution function do life cycle inventories follow?. International Journal of Life Cycle Assessment, 2017, 22, 1138-1145.	2.2	37
43	Environmental and natural resource implications of sustainable urban infrastructure systems. Environmental Research Letters, 2017, 12, 125009.	2.2	13
44	Life-cycle environmental and natural resource implications of energy efficiency technologies. , 2017, , 263-270.		1
45	Interoperability between ecoinvent ver. 3 and US LCI database: a case study. International Journal of Life Cycle Assessment, 2016, 21, 1290-1298.	2.2	28
46	Multi-Scale Governance of Sustainable Natural Resource Useâ€"Challenges and Opportunities for Monitoring and Institutional Development at the National and Global Level. Sustainability, 2016, 8, 778.	1.6	73
47	The emission cost of international sourcing: using structural decomposition analysis to calculate the contribution of international sourcing to CO₂-emission growth. Economic Systems Research, 2016, 28, 151-167.	1.2	96
48	Potential Longâ€Term Global Environmental Implications of Efficient Lightâ€Source Technologies. Journal of Industrial Ecology, 2016, 20, 263-275.	2.8	30
49	Life Cycle Environmental and Natural Resource Implications of Energy Efficiency Technologies. Journal of Industrial Ecology, 2016, 20, 218-222.	2.8	3
50	Stochastic Technology Choice Model for Consequential Life Cycle Assessment. Environmental Science & Technology, 2016, 50, 12575-12583.	4.6	53
51	Challenges in assessing the environmental consequences of dietary changes. Environment Systems and Decisions, 2016, 36, 217-219.	1.9	11
52	A framework for technological learning in the supply chain: A case study on CdTe photovoltaics. Applied Energy, 2016, 169, 721-728.	5.1	29
53	Changes in environmental impacts of major crops in the US. Environmental Research Letters, 2015, 10, 094016.	2.2	49
54	Industrial Ecology: The role of manufactured capital in sustainability. Proceedings of the National Academy of Sciences of the United States of America, 2015, 112, 6260-6264.	3.3	98

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55	CO2 emission clusters within global supply chain networks: Implications for climate change mitigation. Global Environmental Change, 2015, 35, 486-496.	3.6	106
56	Global Mining Risk Footprint of Critical Metals Necessary for Low-Carbon Technologies: The Case of Neodymium, Cobalt, and Platinum in Japan. Environmental Science & Technology, 2015, 49, 2022-2031.	4.6	84
57	Industry-Cost-Curve Approach for Modeling the Environmental Impact of Introducing New Technologies in Life Cycle Assessment. Environmental Science & Technology, 2015, 49, 7543-7551.	4.6	24
58	Land cover change from cotton to corn in the USA relieves freshwater ecotoxicity impact but may aggravate other regional environmental impacts. International Journal of Life Cycle Assessment, 2015, 20, 196-203.	2.2	19
59	Species Sensitivity Distributions for Engineered Nanomaterials. Environmental Science & Technology, 2015, 49, 5753-5759.	4.6	102
60	The Role of Scale and Technology Maturity in Life Cycle Assessment of Emerging Technologies: A Case Study on Carbon Nanotubes. Journal of Industrial Ecology, 2015, 19, 51-60.	2.8	137
61	A Methodology for Integrated, Multiregional Life Cycle Assessment Scenarios under Large-Scale Technological Change. Environmental Science & Technology, 2015, 49, 11218-11226.	4.6	107
62	A Moonshot for Sustainability Assessment. Environmental Science & Technology, 2015, 49, 9497-9498.	4.6	15
63	Bioenergy and climate change mitigation: an assessment. GCB Bioenergy, 2015, 7, 916-944.	2.5	494
64	The material footprint of nations. Proceedings of the National Academy of Sciences of the United States of America, 2015, 112, 6271-6276.	3.3	1,114
65	Integrated life-cycle assessment of electricity-supply scenarios confirms global environmental benefit of low-carbon technologies. Proceedings of the National Academy of Sciences of the United States of America, 2015, 112, 6277-6282.	3.3	508
66	Fusion of conflicting information for improving representativeness of data used in LCAs. International Journal of Life Cycle Assessment, 2014, 19, 480-490.	2.2	7
67	Call for applications: graduate student researcher (PhD student) and postdoctoral associates on LCA research. International Journal of Life Cycle Assessment, 2014, 19, 977-978.	2.2	0
68	Life cycle assessment of engineered nanomaterials. , 2014, , 112-129.		4
69	Thin-Film Photovoltaic Power Generation Offers Decreasing Greenhouse Gas Emissions and Increasing Environmental Co-benefits in the Long Term. Environmental Science & Technology, 2014, 48, 9834-9843.	4.6	61
70	Environmental Performance of Green Building Code and Certification Systems. Environmental Science & Technology, 2014, 48, 2551-2560.	4.6	38
71	Global Flows of Critical Metals Necessary for Low-Carbon Technologies: The Case of Neodymium, Cobalt, and Platinum. Environmental Science & Technology, 2014, 48, 1391-1400.	4.6	142
72	On the uncanny capabilities of consequential LCA. International Journal of Life Cycle Assessment, 2014, 19, 1179-1184.	2.2	92

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73	Assessment of Genetic Diversity, Relationships and Structure among Korean Native Cattle Breeds Using Microsatellite Markers. Asian-Australasian Journal of Animal Sciences, 2014, 27, 1548-1553.	2.4	23
74	Global life cycle releases of engineered nanomaterials. Journal of Nanoparticle Research, 2013, 15, 1.	0.8	1,097
75	Better cars or older cars?: Assessing CO2 emission reduction potential of passenger vehicle replacement programs. Global Environmental Change, 2013, 23, 1807-1818.	3.6	53
76	INPUTâ€"OUTPUT ANALYSIS: THE NEXT 25 YEARS. Economic Systems Research, 2013, 25, 369-389.	1.2	84
77	Production possibility frontier analysis of biodiesel from waste cooking oil. Energy Policy, 2013, 55, 362-368.	4.2	25
78	Finding environmentally important industry clusters: Multiway cut approach using nonnegative matrix factorization. Social Networks, 2013, 35, 423-438.	1.3	41
79	Socioeconomic Drivers of Mercury Emissions in China from 1992 to 2007. Environmental Science & Technology, 2013, 47, 3234-3240.	4.6	101
80	Unintended Environmental Consequences and Co-benefits of Economic Restructuring. Environmental Science & Technology, 2013, 47, 12894-12902.	4.6	36
81	The Importance of Normalization References in Interpreting Life Cycle Assessment Results. Journal of Industrial Ecology, 2013, 17, 385-395.	2.8	46
82	Identifying environmentally important supply chain clusters in the automobile industry. Economic Systems Research, 2013, 25, 265-286.	1.2	27
83	Does Southâ€toâ€North Water Transfer Reduce the Environmental Impact of Water Consumption in China?. Journal of Industrial Ecology, 2012, 16, 647-654.	2.8	33
84	Greening Growing Giants. Journal of Industrial Ecology, 2012, 16, 459-466.	2.8	18
85	Characterization of Economic Requirements for a â€œCarbon-Debt-Free Countryâ€. Environmental Science & Technology, 2012, 46, 155-163.	4.6	29
86	Replacing Gasoline with Corn Ethanol Results in Significant Environmental Problem-Shifting. Environmental Science & Technology, 2012, 46, 3671-3678.	4.6	121
87	Accounting for Changes in Automobile Gasoline Consumption in Japan: 2000â€"2007. Journal of Economic Structures, 2012, 1, .	0.6	2
88	Estimates of Embodied Global Energy and Air-Emission Intensities of Japanese Products for Building a Japanese Inputâ€"Output Life Cycle Assessment Database with a Global System Boundary. Environmental Science & Technology, 2012, 46, 9146-9154.	4.6	79
89	Framework for hybrid life cycle inventory databases: a case study on the Building for Environmental and Economic Sustainability (BEES) database. International Journal of Life Cycle Assessment, 2012, 17, 604-612.	2.2	53
90	Evolution of â€˜designedâ€™ industrial symbiosis networks in the Ulsan Eco-industrial Park: â€˜research and development into businessâ€™ as the enabling framework. Journal of Cleaner Production, 2012, 29-30, 103-112.	4.6	181

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91	Measuring ecological impact of water consumption by bioethanol using life cycle impact assessment. International Journal of Life Cycle Assessment, 2012, 17, 16-24.	2.2	22
92	Life cycle assessment at nanoscale: review and recommendations. International Journal of Life Cycle Assessment, 2012, 17, 295-303.	2.2	98
93	Role of Motor Vehicle Lifetime Extension in Climate Change Policy. Environmental Science & Technology, 2011, 45, 1184-1191.	4.6	62
94	Environmental Impacts of Products in China. Environmental Science & Technology, 2011, 45, 4102-4109.	4.6	36
95	Application of Hybrid Life Cycle Approaches to Emerging Energy Technologies â€“ The Case of Wind Power in the UK. Environmental Science & Technology, 2011, 45, 5900-5907.	4.6	234
96	Phosphorus use-efficiency of agriculture and food system in the US. Chemosphere, 2011, 84, 806-813.	4.2	127
97	Evaluation of water use for bioenergy at different scales. Biofuels, Bioproducts and Biorefining, 2011, 5, 361-374.	1.9	33
98	Implications of corn prices on water footprints of bioethanol. Bioresource Technology, 2011, 102, 4747-4754.	4.8	1
99	COMPARISON OF BOTTOM-UP AND TOP-DOWN APPROACHES TO CALCULATING THE WATER FOOTPRINTS OF NATIONS. Economic Systems Research, 2011, 23, 371-385.	1.2	288
100	Urban water infrastructure optimization to reduce environmental impacts and costs. Journal of Environmental Management, 2010, 91, 630-637.	3.8	31
101	Generalized Make and Use Framework for Allocation in Life Cycle Assessment. Journal of Industrial Ecology, 2010, 14, 335-353.	2.8	105
102	Risk Management Lessons from â€˜Knockâ€in Knockâ€outâ€™ Option Disaster*. Asia-Pacific Journal of Financial Studies, 2010, 39, 28-52.	0.6	9
103	IMPROVING THE COMPLETENESS OF PRODUCT CARBON FOOTPRINTS USING A GLOBAL LINK INPUTâ€“OUTPUT MODEL: THE CASE OF JAPAN. Economic Systems Research, 2009, 21, 267-290.	1.2	78
104	Recent developments in Life Cycle Assessment. Journal of Environmental Management, 2009, 91, 1-21.	3.8	2,163
105	Our plans and expectations for the 14th volume 2009 of Int J Life Cycle Assess. International Journal of Life Cycle Assessment, 2009, 14, 1-7.	2.2	4
106	<i>Handbook of Inputâ€Output Economics in Industrial Ecology</i> edited by Sangwon Suh. Journal of Industrial Ecology, 2009, 13, 830-832.	2.8	3
107	INPUTâ€“OUTPUT ANALYSIS AND CARBON FOOTPRINTING: AN OVERVIEW OF APPLICATIONS. Economic Systems Research, 2009, 21, 187-216.	1.2	436
108	Material and Energy Dependence of Services and Its Implications for Climate Change. Environmental Science & Technology, 2009, 43, 4241-4246.	4.6	85

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109	Water Embodied in Bioethanol in the United States. Environmental Science & Technology, 2009, 43, 2688-2692.	4.6	131
110	Reducing Greenhouse Gas Emissions for Climate Stabilization: Framing Regional Options. Environmental Science & Technology, 2009, 43, 1696-1703.	4.6	24
111	Handbook of Input-Output Economics in Industrial Ecology. Eco-efficiency in Industry and Science, 2009, , .	0.1	90
112	How Has Dematerialization Contributed to Reducing Oil Price Pressure?: A Qualitative Inputâ˘'Output Analysis for the Japanese Economy during 1990â˘'2000. Environmental Science & Technology, 2009, 43, 245-252.	4.6	7
113	Pseudospectral methods for pricing options. Quantitative Finance, 2009, 9, 705-715.	0.9	3
114	Methods in the Life Cycle Inventory of a Product. Eco-efficiency in Industry and Science, 2009, , 263-282.	0.1	12
115	Industrial Ecology and Input-Output Economics: A Brief History. Eco-efficiency in Industry and Science, 2009, , 43-58.	0.1	5
116	Developing the Sectoral Environmental Database for Input-Output Analysis: Comprehensive Environmental Data Archive of the U.S.. Eco-efficiency in Industry and Science, 2009, , 689-712.	0.1	10
117	Multistage Process-Based Make-Use System. Eco-efficiency in Industry and Science, 2009, , 777-800.	0.1	6
118	Physical Input-Output Analysis and Disposals to Nature. Eco-efficiency in Industry and Science, 2009, , 123-137.	0.1	8
119	Prioritizing Within the Product-Oriented Environmental Policy â€" The Danish Perspectives. Eco-efficiency in Industry and Science, 2009, , 397-415.	0.1	0
120	Environmental Impacts of Conventional and Sustainable Investment Funds Compared Using Input-Output Life-Cycle Assessment. Journal of Industrial Ecology, 2008, 11, 41-60.	2.8	42
121	A Mixed-Unit Input-Output Model for Environmental Life-Cycle Assessment and Material Flow Analysis. Environmental Science & Technology, 2007, 41, 1024-1031.	4.6	155
122	Simple Indicator To Identify the Environmental Soundness of Growth of Consumption and Technology:Â â€œEco-velocity of Consumptionâ€• Environmental Science & Technology, 2007, 41, 1465-1472.	4.6	24
123	Five years in the area of input-output and hybrid LCA. International Journal of Life Cycle Assessment, 2007, 12, 351-352.	2.2	77
124	Power series expansion and structural analysis for life cycle assessment. International Journal of Life Cycle Assessment, 2007, 12, 381-390.	2.2	58
125	Five years in the area of input-output and hybrid LCA. International Journal of Life Cycle Assessment, 2007, 12, 351-352.	2.2	29
126	Power series expansion and structural analysis for life cycle assessment. International Journal of Life Cycle Assessment, 2007, 12, 381-390.	2.2	13

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127	Are Services Better for Climate Change?. Environmental Science & Technology, 2006, 40, 6555-6560.	4.6	117
128	Reformulation of matrix-based LCI: from product balance to process balance. Journal of Cleaner Production, 2006, 14, 47-51.	4.6	42
129	Cultivating a Healthy Journal Space. International Journal of Life Cycle Assessment, 2006, 11, 77-79.	2.2	2
130	Human and Ecological Life Cycle Tools for the Integrated Assessment of Systems (HELIAS). International Journal of Life Cycle Assessment, 2006, 11, 19-28.	2.2	7
131	Environmental Impacts of Consumption in the European Union:High-Resolution Input-Output Tables with Detailed Environmental Extensions. Journal of Industrial Ecology, 2006, 10, 129-146.	2.8	125
132	Toward an Information Tool for Integrated Product Policy: Requirements for Data and Computation. Journal of Industrial Ecology, 2006, 10, 147-158.	2.8	48
133	Environmental Impacts of Products:Policy Relevant Information and Data Challenges. Journal of Industrial Ecology, 2006, 10, 183-198.	2.8	47
134	Setting Priorities within Product-Oriented Environmental Policy. Journal of Industrial Ecology, 2006, 10, 73-87.	2.8	22
135	Reply: Downstream cut-offs in integrated hybrid life-cycle assessment. Ecological Economics, 2006, 59, 7-12.	2.9	47
136	Methods for Life Cycle Inventory of a product. Journal of Cleaner Production, 2005, 13, 687-697.	4.6	556
137	Eco-efficiency for Pollution Prevention in Small to Medium-Sized Enterprises: A Case from South Korea. Journal of Industrial Ecology, 2005, 9, 223-240.	2.8	48
138	Numerical Approaches to Life Cycle Interpretation - The case of the Ecoinventâ€™96 database (10 pp). International Journal of Life Cycle Assessment, 2005, 10, 103-112.	2.2	58
139	A Structure Comparison of two Approaches to LCA Inventory Data, Based on the MIET and ETH Databases (10 pp). International Journal of Life Cycle Assessment, 2005, 10, 317-324.	2.2	37
140	Corporate Environmental Management Program at the University of Minnesota. International Journal of Life Cycle Assessment, 2005, 10, 445-445.	2.2	0
141	Theory of materials and energy flow analysis in ecology and economics. Ecological Modelling, 2005, 189, 251-269.	1.2	114
142	Industrial ecology and input-output economics: an introduction. Economic Systems Research, 2005, 17, 349-364.	1.2	59
143	Developing a sectoral environmental database for inputâ€"output analysis: the comprehensive environmental data archive of the US. Economic Systems Research, 2005, 17, 449-469.	1.2	62
144	A note on the calculus for physical inputâ€"output analysis and its application to land appropriation of international trade activities. Ecological Economics, 2004, 48, 9-17.	2.9	63

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145	Functions, commodities and environmental impacts in an ecologicalâ€"economic model. Ecological Economics, 2004, 48, 451-467.	2.9	251
146	Three Strategies to Overcome the Limitations of Life-Cycle Assessment. Journal of Industrial Ecology, 2004, 8, 19-32.	2.8	140
147	The portrait of Wassily Leontief. International Journal of Life Cycle Assessment, 2004, 9, 1.	2.2	4
148	Materials and energy flows in industry and ecosystem networks. International Journal of Life Cycle Assessment, 2004, 9, 335-336.	2.2	13
149	System Boundary Selection in Life-Cycle Inventories Using Hybrid Approaches. Environmental Science & Technology, 2004, 38, 657-664.	4.6	876
150	Life cycle assessment. Environment International, 2004, 30, 701-720.	4.8	1,541
151	Input-output and hybrid life cycle assessment. International Journal of Life Cycle Assessment, 2003, 8, 257-257.	2.2	23
152	Normalisation figures for environmental life-cycle assessment. Journal of Cleaner Production, 2003, 11, 737-748.	4.6	106
153	Missing inventory estimation tool using extended input-output analysis. International Journal of Life Cycle Assessment, 2002, 7, 134-140.	2.2	128
154	The Computational Structure of Life Cycle Assessment. Eco-efficiency in Industry and Science, 2002, , .	0.1	356
155	The basic model for inventory analysis. Eco-efficiency in Industry and Science, 2002, , 11-31.	0.1	14
156	Advanced topics in inventory analysis. Eco-efficiency in Industry and Science, 2002, , 99-116.	0.1	0
157	Structural theory. Eco-efficiency in Industry and Science, 2002, , 151-159.	0.1	0
158	Relation with input-output analysis. Eco-efficiency in Industry and Science, 2002, , 117-129.	0.1	0
159	Life cycle environmental impact of the Internet infrastructure in a university. , 0, , .		1