Robert U Ayres

List of Publications by Year
in descending order

128	7,360	53794	58581
papers	citations	45 h-index	82 g-index

140	140	140	4964
all docs	docs citations	times ranked	citing authors

#	Article	IF	Citations
1	On the Creation and Destruction of National Wealth: Are Financial Collapses Endogenous?. Sustainability, 2021, 13, 7352.	3.2	3
2	A Note on the Role of Energy in Production. Ecological Economics, 2019, 157, 40-46.	5.7	62
3	Gaps in Mainstream Economics: Energy, Growth, and Sustainability. Studies in Ecological Economics, 2017, , 39-53.	0.2	1
4	Structure and dynamics of useful work along the agriculture-industry-services transition: Portugal from 1856 to 2009. Structural Change and Economic Dynamics, 2016, 36, 1-21.	4.5	33
5	The economic growth enigma revisited: The EU-15 since the 1970s. Energy Policy, 2015, 86, 812-832.	8.8	16
6	Recycling Rare Metals. , 2014, , 27-38.		6
7	The economic growth enigma: Capital, labour and useful energy?. Energy Policy, 2014, 64, 16-28.	8.8	106
8	Decomposition of useful work intensity: The EU (European Union)-15 countries from 1960 to 2009. Energy, 2014, 76, 704-715.	8.8	56
9	Lithium: Sources, Production, Uses, and Recovery Outlook. Jom, 2013, 65, 986-996.	1.9	172
10	The underestimated contribution of energy to economic growth. Structural Change and Economic Dynamics, 2013, 27, 79-88.	4.5	139
11	Sustainability transition and economic growth enigma: Money or energy?. Environmental Innovation and Societal Transitions, 2013, 9, 8-12.	5.5	9
12	Boosting resource productivity: Creating ping-pong dynamics between resource productivity and resource prices. Environmental Innovation and Societal Transitions, 2013, 9, 48-55.	5.5	3
13	Material Flow Analysis of Scarce Metals: Sources, Functions, End-Uses and Aspects for Future Supply. Environmental Science & Technology, 2013, 47, 2939-2947.	10.0	105
14	Material efficiency: rare and critical metals. Philosophical Transactions Series A, Mathematical, Physical, and Engineering Sciences, 2013, 371, 20110563.	3.4	62
15	Useful work and information as drivers of economic growth. Ecological Economics, 2012, 73, 93-102.	5.7	73
16	Exergy Efficiency in Industry: Where Do We Stand?. Environmental Science & Technology, 2011, 45, 10634-10641.	10.0	38
17	Materials Balance Models. , 2011, , 403-422.		3
18	Evidence of causality between the quantity and quality of energy consumption and economic growth. Energy, 2010, 35, 1688-1693.	8.8	173

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19	Energy use and economic development: A comparative analysis of useful work supply in Austria, Japan, the United Kingdom and the US during 100years of economic growth. Ecological Economics, 2010, 69, 1904-1917.	5.7	127
20	Thermodynamic laws, economic methods and the productive power of energy. Journal of Non-Equilibrium Thermodynamics, 2010, 35, .	4.2	39
21	Energy Efficiency and Economic Growth: the â€˜Rebound Effectâ€™ as a Driver. , 2009, , 119-135.		9
22	Nonlinear Stabilizers of Economic Growth under Exhausting Energy Resources*. IFAC Postprint Volumes IPPV / International Federation of Automatic Control, 2009, 42, 251-256.	0.4	5
23	Economic Growth and Development: Towards a Catchup Model. Environmental and Resource Economics, 2008, 40, 1-36.	3.2	5
24	Accounting for Fluorine: Production, Use, and Loss. Journal of Industrial Ecology, 2008, 11, 85-101.	5.5	46
25	Global Phosphorus Flows and Environmental Impacts from a Consumption Perspective. Journal of Industrial Ecology, 2008, 12, 229-247.	5.5	280
26	Global Phosphorus Flows in the Industrial Economy From a Production Perspective. Journal of Industrial Ecology, 2008, 12, 557-569.	5.5	106
27	Sustainability economics: Where do we stand?. Ecological Economics, 2008, 67, 281-310.	5.7	159
28	Long term trends in resource exergy consumption and useful work supplies in the UK, 1900 to 2000. Ecological Economics, 2008, 68, 126-140.	5.7	42
29	Efficiency Dilution: Long-Term Exergy Conversion Trends in Japan. Environmental Science & Technology, 2008, 42, 4964-4970.	10.0	23
30	Energy Myth Eight â€“ Worldwide Power Systems are Economically and Environmentally Optimal. , 2007, , 201-237.		5
31	Comparative analysis of phosphorus use within national and local economies in China. Resources, Conservation and Recycling, 2007, 51, 454-474.	10.8	21
32	On the practical limits to substitution. Ecological Economics, 2007, 61, 115-128.	5.7	181
33	Energy efficiency, sustainability and economic growth. Energy, 2007, 32, 634-648.	8.8	171
34	An Application of Exergy Accounting to Five Basic Metal Industries. Eco-efficiency in Industry and Science, 2006, , 141-194.	0.1	28
35	REXS: A forecasting model for assessing the impact of natural resource consumption and technological change on economic growth. Structural Change and Economic Dynamics, 2006, 17, 329-378.	4.5	46
36	From LTER to LTSER: Conceptualizing the Socioeconomic Dimension of Long-term Socioecological Research. Ecology and Society, 2006, 11, .	2.3	189

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37	A proposal for emission calculations for chemical processes, Part I. Resources, Conservation and Recycling, 2006, 48, 280-299.	10.8	3
38	Turning point: The end of exponential growth?. Technological Forecasting and Social Change, 2006, 73, 1188-1203.	11.6	32
39	A theory of economic growth with material/energy resources and dematerialization: Interaction of three growth mechanisms. Ecological Economics, 2005, 55, 96-118.	5.7	99
40	Unconvinced about a 5th K-wave: A response to Devezas et al.. Technological Forecasting and Social Change, 2005, 72, 936-937.	11.6	6
41	On the efficiency of US electricity usage since 1900. Energy, 2005, 30, 1092-1145.	8.8	43
42	Accounting for growth: the role of physical work. Structural Change and Economic Dynamics, 2005, 16, 181-209.	4.5	292
43	Exergy: Reference States and Balance Conditions. , 2004, , 633-640.		1
44	The digital economy: Where do we stand?. Technological Forecasting and Social Change, 2004, 71, 315-339.	11.6	63
45	On the life cycle metaphor: where ecology and economics diverge. Ecological Economics, 2004, 48, 425-438.	5.7	109
46	Response to Comment on â€œThe 1.7 Kilogram Microchip:Â Energy and Material Use in the Production of Semiconductor Devicesâ€• Environmental Science & Technology, 2004, 38, 1916-1917.	10.0	6
47	Thermodynamics and Economics, Overview. , 2004, , 91-97.		4
48	Exergy, power and work in the US economy, 1900â€“1998. Energy, 2003, 28, 219-273.	8.8	277
49	The Life Cycle of Copper, Its Co-Products and Byproducts. Eco-efficiency in Industry and Science, 2003, , .	0.1	60
50	The 1.7 Kilogram Microchip:Â Energy and Material Use in the Production of Semiconductor Devices. Environmental Science & Technology, 2002, 36, 5504-5510.	10.0	326
51	The minimum complexity of endogenous growth models: the role of physical resource flows. Energy, 2001, 26, 817-838.	8.8	47
52	Nitrogen's Role in Industrial Systems. Journal of Industrial Ecology, 2001, 5, 77-103.	5.5	30
53	Materials and the Global Environment: Waste Mining in the 21st Century. MRS Bulletin, 2001, 26, 477-480.	3.5	71
54	Strong versus Weak Sustainability. Environmental Ethics, 2001, 23, 155-168.	0.4	154

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55	The impact of remanufacturing in the economy. Ecological Economics, 2000, 32, 413-429.	5.7	119
56	On Forecasting Discontinuities. Technological Forecasting and Social Change, 2000, 65, 81-97.	11.6	55
57	The Life-Cycle of Chlorine, Part IV. Journal of Industrial Ecology, 1999, 3, 121-159.	5.5	11
58	Economic assumptions in need of renovation. Technological Forecasting and Social Change, 1999, 62, 115-117.	11.6	2
59	The second law, the fourth law, recycling and limits to growth. Ecological Economics, 1999, 29, 473-483.	5.7	162
60	Towards a Disequilibrium Theory of Endogenous Economic Growth. Environmental and Resource Economics, 1998, 11, 289-300.	3.2	21
61	The Life Cycle of Chlorine, Part III.. Journal of Industrial Ecology, 1998, 2, 93-115.	5.5	5
62	Technological Progress. Technological Forecasting and Social Change, 1998, 59, 213-233.	11.6	20
63	Exergy, waste accounting, and life-cycle analysis. Energy, 1998, 23, 355-363.	8.8	229
64	Eco-thermodynamics: economics and the second law. Ecological Economics, 1998, 26, 189-209.	5.7	221
65	The price-value paradox. Ecological Economics, 1998, 25, 17-19.	5.7	35
66	Peer Reviewed: Toward a Nonpolluting Energy System. Environmental Science & Technology, 1998, 32, 408A-410A.	10.0	2
67	Rationale for a physical account of economic activities. Environment & Policy, 1998, , 1-20.	0.4	1
68	Industrial metabolism: work in progress. Economy & Environment, 1998, , 195-228.	0.3	13
69	The Kuznets curve and the life cycle analogy. Structural Change and Economic Dynamics, 1997, 8, 413-426.	4.5	8
70	Comments on Georgescu-Roegen. Ecological Economics, 1997, 22, 285-287.	5.7	35
71	Eco-efficiency, asset recovery and remanufacturing. European Management Journal, 1997, 15, 557-574.	5.1	224
72	The Life-Cycle of Chlorine, Part I: Chlorine Production and the Chlorine-Mercury Connection. Journal of Industrial Ecology, 1997, 1, 81-94.	5.5	52

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73	The Life Cycle of Chlorine, Part II: Conversion Processes and Use in the European Chemical Industry. Journal of Industrial Ecology, 1997, 1, 65-89.	5.5	20
74	Integrated assessment of the grand nutrient cycles. Environmental Modeling and Assessment, 1997, 2, 107-128.	2.2	10
75	Metals recycling: economic and environmental implications. Resources, Conservation and Recycling, 1997, 21, 145-173.	10.8	170
76	Environmental market failures: Are there any local market-based corrective mechanisms for global problems?. Mitigation and Adaptation Strategies for Global Change, 1997, 1, 289-309.	2.1	21
77	Statistical measures of unsustainability. Ecological Economics, 1996, 16, 239-255.	5.7	39
78	Limits to the growth paradigm. Ecological Economics, 1996, 19, 117-134.	5.7	113
79	Foresight as a survival characteristic: When (if ever) does the long view pay?. Technological Forecasting and Social Change, 1996, 51, 209-235.	11.6	28
80	Technology, progress and economic growth. European Management Journal, 1996, 14, 562-575.	5.1	32
81	Wealth accumulation and economic progress. Journal of Evolutionary Economics, 1996, 6, 347-359.	1.7	6
82	Wealth accumulation and economic progress. Journal of Evolutionary Economics, 1996, 6, 347-359.	1.7	1
83	Life cycle analysis: A critique. Resources, Conservation and Recycling, 1995, 14, 199-223.	10.8	188
84	Economic growth: politically necessary but not environmentally friendly. Ecological Economics, 1995, 15, 97-99.	5.7	49
85	On economic disequilibrium and free lunch. Environmental and Resource Economics, 1994, 4, 435-454.	3.2	31
86	Toward a non-linear dynamics of technological progress. Journal of Economic Behavior and Organization, 1994, 24, 35-69.	2.0	48
87	Cowboys, cornucopians and long-run sustainability. Ecological Economics, 1993, 8, 189-207.	5.7	52
88	Toxic heavy metals: materials cycle optimization.. Proceedings of the National Academy of Sciences of the United States of America, 1992, 89, 815-820.	7.1	102
89	Experience and the life cycle: Some analytic implications. Technovation, 1992, 12, 465-486.	7.8	22
90	Evolutionary economics and environmental imperatives. Structural Change and Economic Dynamics, 1991, 2, 255-273.	4.5	42

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91	Competition and complementarity in diffusion. Technological Forecasting and Social Change, 1991, 39, 145-158.	11.6	5
92	The greenhouse effect: Damages, costs and abatement. Environmental and Resource Economics, 1991, 1, 237-270.	3.2	182
93	Technological transformations and long waves. Part I. Technological Forecasting and Social Change, 1990, 37, 1-37.	11.6	94
94	Technological transformations and long waves. Part II. Technological Forecasting and Social Change, 1990, 37, 111-137.	11.6	60
95	Technology and information: chain reactions and sustainable economic growth. Technovation, 1990, 10, 163-183.	7.8	4
96	The role of machine sensing in CIM. Robotics and Computer-Integrated Manufacturing, 1989, 5, 53-71.	9.9	3
97	Time preference and the life cycle: The logic of long-term high risk vs. short-term low risk. European Journal of Operational Research, 1989, 38, 329-349.	5.7	3
98	The future of technological forecasting. Technological Forecasting and Social Change, 1989, 36, 49-60.	11.6	28
99	The Barrier-Breakthrough Model of Innovation and the Life Cycle Model of Industrial Evolution as Applied to the U.S. Electrical Industry. , 1989, , 115-132.		0
100	Technology: The wealth of nations. Technological Forecasting and Social Change, 1988, 33, 189-201.	11.6	19
101	Optimal investment policies with exhaustible resources: An information-based model. Journal of Environmental Economics and Management, 1988, 15, 439-461.	4.7	10
102	Barriers and breakthroughs: an â€œexpanding frontiersâ€•model of the technology-industry life cycle. Technovation, 1988, 7, 87-115.	7.8	47
103	Utility maximization and catasphore aversion: A simulation test. Journal of Environmental Economics and Management, 1987, 14, 337-370.	4.7	5
104	Bhopal. Technology in Society, 1987, 9, 19-45.	9.4	16
105	Technological protection and piracy: Some implications for policy. Technological Forecasting and Social Change, 1986, 30, 5-18.	11.6	2
106	The man-machine interface. Technological Forecasting and Social Change, 1986, 29, 99-118.	11.6	9
107	Patterns of Pollution in the Hudson-Raritan Basin. Environment, 1986, 28, 14-43.	1.4	42
108	Catastrophe avoidance and risk aversion: Implications of formal utility maximization. Theory and Decision, 1986, 20, 63-78.	1.0	4

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109	REJUVENATING THE LIFE CYCLE CONCEPT. Journal of Business Strategy, 1985, 6, 66-76.	1.6	25
110	Social technology and economic development. Technological Forecasting and Social Change, 1985, 28, 141-157.	11.6	6
111	A Schumpeterian model of technological substitution. Technological Forecasting and Social Change, 1985, 27, 375-383.	11.6	12
112	Empirical measures of technological change at the sectoral level. Technological Forecasting and Social Change, 1985, 27, 229-247.	11.6	21
113	Limits and possibilities of large-scale long-range societal models. Technological Forecasting and Social Change, 1984, 25, 297-308.	11.6	17
114	Improving the scientific basis of public and private decision-making. Technological Forecasting and Social Change, 1984, 26, 195-199.	11.6	4
115	Robotic Realities: Near-Term Prospects and Problems. Annals of the American Academy of Political and Social Science, 1983, 470, 28-55.	1.6	10
116	Robotics and conservation of human resources. Technology in Society, 1982, 4, 181-197.	9.4	8
117	Robotics, CAM, and industrial productivity. National Productivity Review, 1981, 1, 42-60.	0.1	8
118	Growth, risk and technological choice. Technology in Society, 1980, 2, 413-431.	9.4	3
119	The role of technological change. Journal of Environmental Economics and Management, 1980, 7, 353-371.	4.7	57
120	Explicit technological substitution forecasts in long-range input-output models. Technological Forecasting and Social Change, 1976, 9, 113-138.	11.6	17
121	A model for forecasting the substitution of one technology for another. Technological Forecasting and Social Change, 1975, 7, 57-79.	11.6	39
122	Economic Impact of Mass Production of Alternative Low Emission Automotive Power Systems. Journal of the Air Pollution Control Association, 1974, 24, 216-224.	0.5	0
123	Tax Strategies for Industrial Pollution Abatement. IEEE Transactions on Systems, Man, and Cybernetics, 1973, SMC-3, 588-603.	0.9	5
124	Individual versus mass transportation: feasibility of substitution. Transportation Planning and Technology, 1972, 1, 107-113.	2.0	1
125	Social and Economic Implications of Low Emission Vehicles. , 1972, , .		1
126	On the sustenance of technological innovation. Technological Forecasting and Social Change, 1971, 3, 273-278.	11.6	0

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127	The Underestimated Contribution of Energy to Economic Growth. SSRN Electronic Journal, 0, , .	0.4	2
128	Economics and the Environment. , 0, , .		30