

Table S1. Research direction count table.

Research Direction	Record Number	Percentile of 719
Environmental Sciences Ecology	548	76.217
Zoology	343	47.705
Behavioral Sciences	263	36.579
Public Environmental Occupational Health	241	33.519
Physiology	195	27.121
Biodiversity Conservation	187	26.008
Reproductive Biology	110	15.299
Science Technology Other Topics	109	15.16
Meteorology Atmospheric Sciences	107	14.882
Life Sciences Biomedicine Other Topics	96	13.352
Biochemistry Molecular Biology	92	12.796
Nutrition Dietetics	91	12.656
Toxicology	90	12.517
Instruments Instrumentation	86	11.961
Marine Freshwater Biology	75	10.431
Endocrinology Metabolism	72	10.014
Geography	66	9.179
Remote Sensing	63	8.762
Neurosciences Neurology	62	8.623
Geochemistry Geophysics	56	7.789
Imaging Science Photographic Technology	56	7.789
Entomology	55	7.65
Anthropology	54	7.51
Genetics Heredity	54	7.51
Geology	51	7.093
Psychology	49	6.815
Physical Sciences Other Topics	47	6.537
Plant Sciences	47	6.537
Developmental Biology	46	6.398
Computer Science	44	6.12
Communication	43	5.981
Astronomy Astrophysics	40	5.563
Engineering	40	5.563
Chemistry	38	5.285
Evolutionary Biology	38	5.285
Mathematics	38	5.285
Optics	37	5.146
Anatomy Morphology	34	4.729
Energy Fuels	34	4.729
Forestry	27	3.755

Research Direction	Record Number	Percentile of 719
Physical Geography	27	3.755
Immunology	26	3.616
Water Resources	26	3.616
Pathology	25	3.477
Urban Studies	25	3.477
Business Economics	24	3.338
Agriculture	23	3.199
Oncology	19	2.643
Spectroscopy	19	2.643
Health Care Sciences Services	18	2.503
Mathematical Computational Biology	18	2.503
Sociology	18	2.503
Physics	17	2.364
Infectious Diseases	16	2.225
Psychiatry	16	2.225
Demography	13	1.808
Fisheries	13	1.808
Pharmacology Pharmacy	13	1.808
Cell Biology	12	1.669
Social Sciences Other Topics	11	1.53
Cardiovascular System Cardiology	10	1.391
Obstetrics Gynecology	10	1.391
Automation Control Systems	9	1.252
Gastroenterology Hepatology	9	1.252
Microbiology	9	1.252
Biophysics	8	1.113
Pediatrics	8	1.113
Veterinary Sciences	8	1.113
Acoustics	7	0.974
Dermatology	7	0.974
Education Educational Research	7	0.974
Hematology	7	0.974
Parasitology	7	0.974
Public Administration	7	0.974
Social Issues	7	0.974
Food Science Technology	6	0.834
General Internal Medicine	6	0.834
Government Law	6	0.834
Oceanography	6	0.834
Research Experimental Medicine	6	0.834
Construction Building Technology	5	0.695

Research Direction	Record Number	Percentile of 719
Geriatrics Gerontology	5	0.695
Telecommunications	5	0.695
Urology Nephrology	5	0.695
Allergy	4	0.556
Information Science Library Science	4	0.556
Medical Laboratory Technology	4	0.556
Ophthalmology	4	0.556
Mycology	3	0.417
Respiratory System	3	0.417
Robotics	3	0.417
Arts Humanities Other Topics	2	0.278
Biotechnology Applied Microbiology	2	0.278
History	2	0.278
History Philosophy Of Science	2	0.278
Materials Science	2	0.278
Mechanics	2	0.278
Mining Mineral Processing	2	0.278
Virology	2	0.278
Emergency Medicine	1	0.139
Film Radio Television	1	0.139
Integrative Complementary Medicine	1	0.139
Mathematical Methods In Social Sciences	1	0.139
Medical Ethics	1	0.139
Medical Informatics	1	0.139
Metallurgy Metallurgical Engineering	1	0.139
Microscopy	1	0.139
Mineralogy	1	0.139
Nuclear Science Technology	1	0.139
Operations Research Management Science	1	0.139
Paleontology	1	0.139
Philosophy	1	0.139
Sport Sciences	1	0.139
Transportation	1	0.139
Tropical Medicine	1	0.139

Table S2. Table of the number of literatures published in each country.

Country/Region	Record Number	Continent	Developed Country or not
USA	167	North America	Yes
Germany	117	Europe	Yes
UK	104	Europe	Yes
China	76	Asia	No
Australia	54	Oceania	Yes
Spain	52	Europe	Yes
Italy	51	Europe	Yes
Netherlands	46	Europe	Yes
Canada	43	North America	Yes
France	43	Europe	Yes
Israel	43	Asia	Yes
Slovakia	25	Europe	Yes
Poland	21	Europe	No
Mexico	16	North America	No
Switzerland	16	Europe	Yes
Chile	15	South America	No
Belgium	13	Europe	Yes
Hungary	12	Europe	No
India	12	Asia	No
Sweden	11	Europe	Yes
Austria	10	Europe	Yes
Brazil	9	South America	No
Finland	9	Europe	Yes
South Korea	9	Asia	Yes
Japan	8	Asia	Yes
Argentina	7	South America	No
Greece	7	Europe	Yes
New Zealand	7	Oceania	Yes
Portugal	7	Europe	Yes
Indonesia	6	Asia	No
South Africa	5	Africa	No
Egypt	4	Africa	No
Estonia	4	Europe	Yes
Norway	4	Europe	Yes
Czech Republic	3	Europe	Yes
Ireland	3	Europe	Yes
Russia	3	Europe	No
Colombia	2	South America	No
Croatia	2	Europe	Yes
Denmark	2	Europe	Yes

Country/Region	Record Number	Continent	Developed Country or not
Latvia	2	Europe	Yes
Monaco	2	Europe	Yes
Panama	2	North America	No
Philippines	2	Asia	No
Serbia	2	Europe	No
Ukraine	2	Europe	No
Antigua and Barbuda	1	North America	No
Barbados	1	North America	No
Bulgaria	1	Europe	No
Ecuador	1	South America	No
Kenya	1	Africa	No
Malaysia	1	Asia	No
Montenegro	1	Europe	No
Peru	1	South America	No
Romania	1	Europe	No
Saudi Arabia	1	Asia	No
Singapore	1	Asia	Yes
Slovenia	1	Europe	Yes
Note: Classification of countries based on: information published by the World Bank, the International Monetary Fund, the United Nations Development Program, the U.S. Central Intelligence Agency, etc. https://en.wikipedia.org/wiki/Developed_country			

Table S3. Visual word list based on VOSviewer.

Label	Cluster	Weight<Total link strength>
Activity	1	44
ALAN	5	344
Attraction	1	60
Bat	1	31
Behavior	1	216
Biodiversity	1	105
Bird	1	60
Brightness	2	241
Cancer	3	43
Climate change	4	37
Color	2	71
Conservation	1	65
Dark sky	2	55
Dim light	3	91
Disturbance	3	60
Diversity	1	51
DMSP-OLS	2	37
Dynamic	2	64
Ecosystem	2	81
Electricity	2	31
Satellite	2	34
Evolution	1	61
Exposure	3	148
Growth	4	74
Habitat	1	51
Health	3	31
Impact	5	326
Stress	3	31
Insect	1	76
Light pollution	5	567
Melatonin	3	169
Modelling	2	65
Moonlight	1	28
Mortality	1	40
Nighttime	5	327
NTL	2	49
Orientation	1	54
Pattern	1	73
Photoperiod	4	44
Phytophysiology	4	45
Population	2	58

Label	Cluster	Weight<Total link strength>
Predation	1	100
Remote sensing	2	60
Response	4	174
Rhythm	3	52
Turtle	1	44
Risk	3	50
Accident	3	41
Skyglow	2	49
Sleep	3	50
Spectral composition	4	35
Pollination	4	33
NPP-VIIRS	2	45
Trend	2	24
Urbanization	2	105

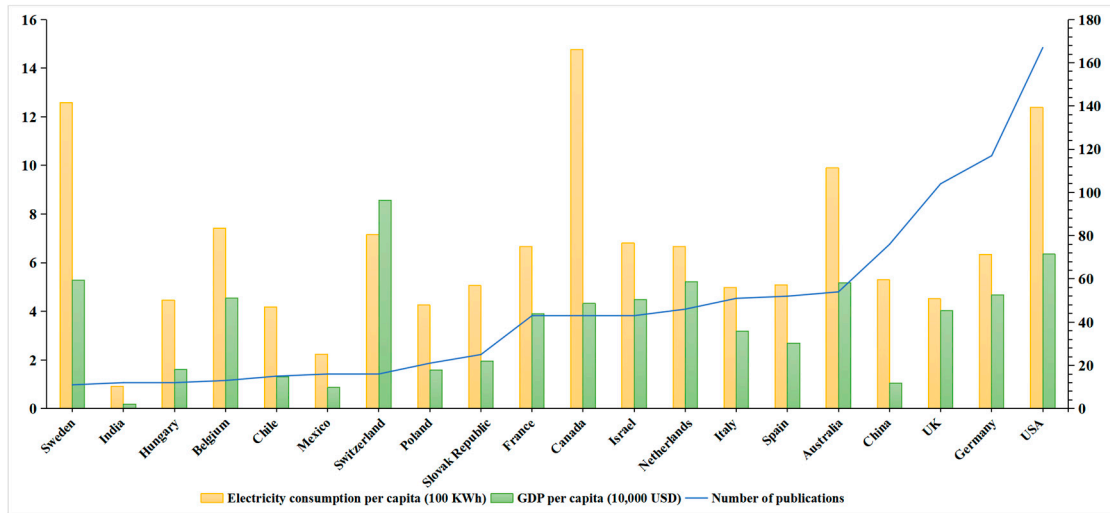


Figure S1. Per capita values of electricity consumption and GDP and number of literatures published by country.

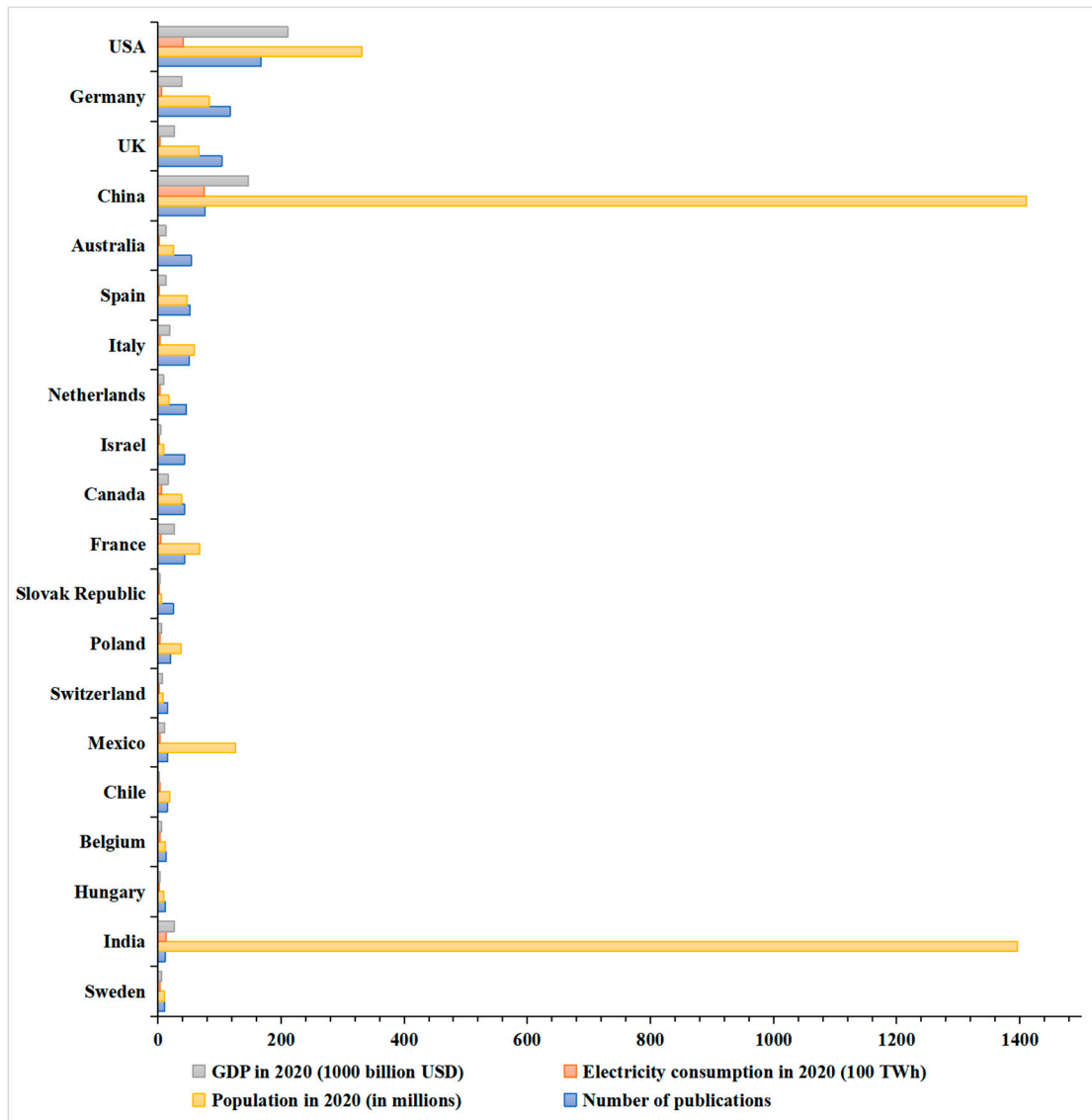


Figure S2. Total value of electricity consumption, GDP and population, and number of literatures published by country.