



Operationalizing Sustainable Development

Analytical Perspectives on Statement of Task

National Academies of Sciences, Engineering, and Medicine
Committee on Operationalizing Sustainable Development

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SVP Global Strategic Networks, Elsevier

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Comment on Statement of Task

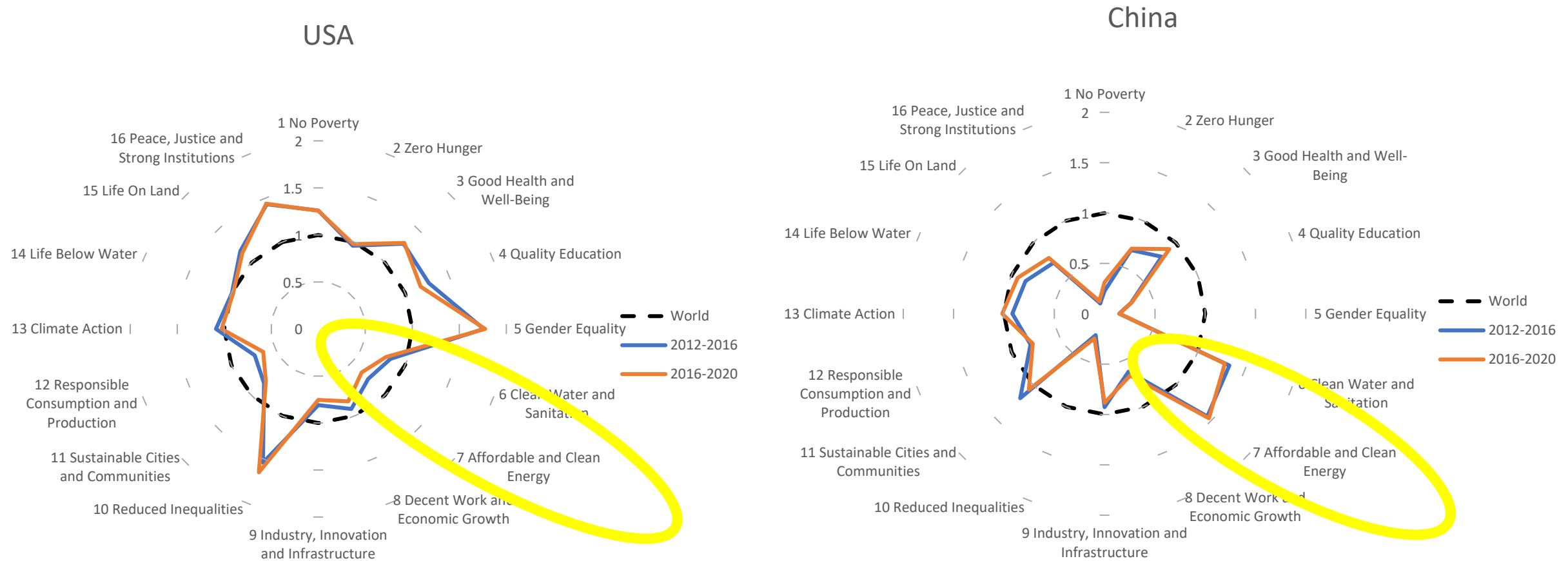
“Identification of key research priorities and possible actionable steps needed to operationalize sustainable development at global and local level.”

Data-driven perspectives can inform:

- Benchmarks for research performance using SDG paradigms
- Deeper understanding of international collaboration in SDG endeavors
- Support for SDG awareness and Grand Challenge activity at funder, agency and academic institutions

1a. Benchmark research performance: SDG paradigms

Relative Activity Index for SDG publications



1b. Benchmark research performance: Topics - Net Zero

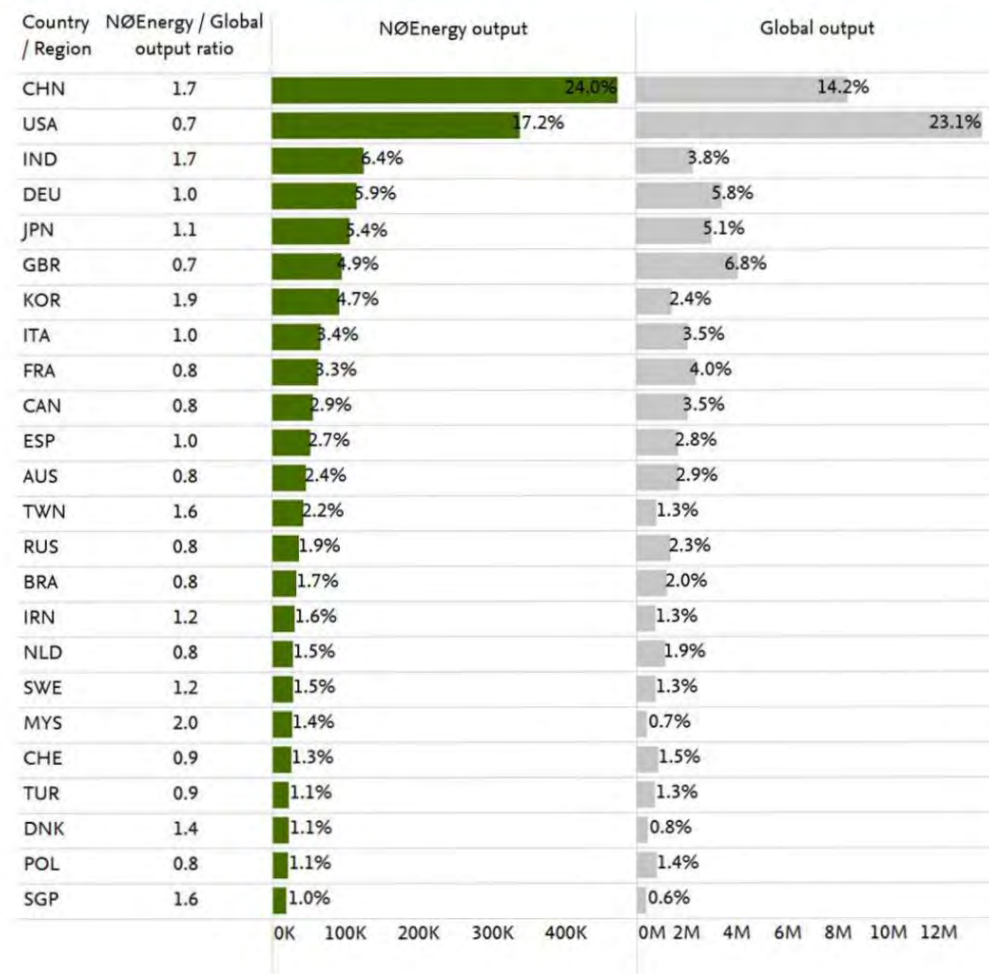


Figure 11
NØEnergy and overall global output by countries and regions that contributed to at least 1% of NØEnergy publications, 2001–2020. The number next to the country and region code indicates the ratio of NØEnergy share divided by overall share, where 1.0 indicates a higher share than the global average.
Source: Scopus

Countries and regions that contributed to at least 1% of NetZero Energy publications between 2001-2020

- China leads in Net Zero Energy publication output, producing nearly 400,000 publications between 2001-20; followed by the US with 280,000.
- China's ratio of Net Zero publications to overall total output share is 1.7; US is 0.7
- India, Germany and Japan complete the top five countries in term of output.

1c. Benchmark and Target research performance: Topics

NetZero Topic clusters by output 2011-20

CHINA

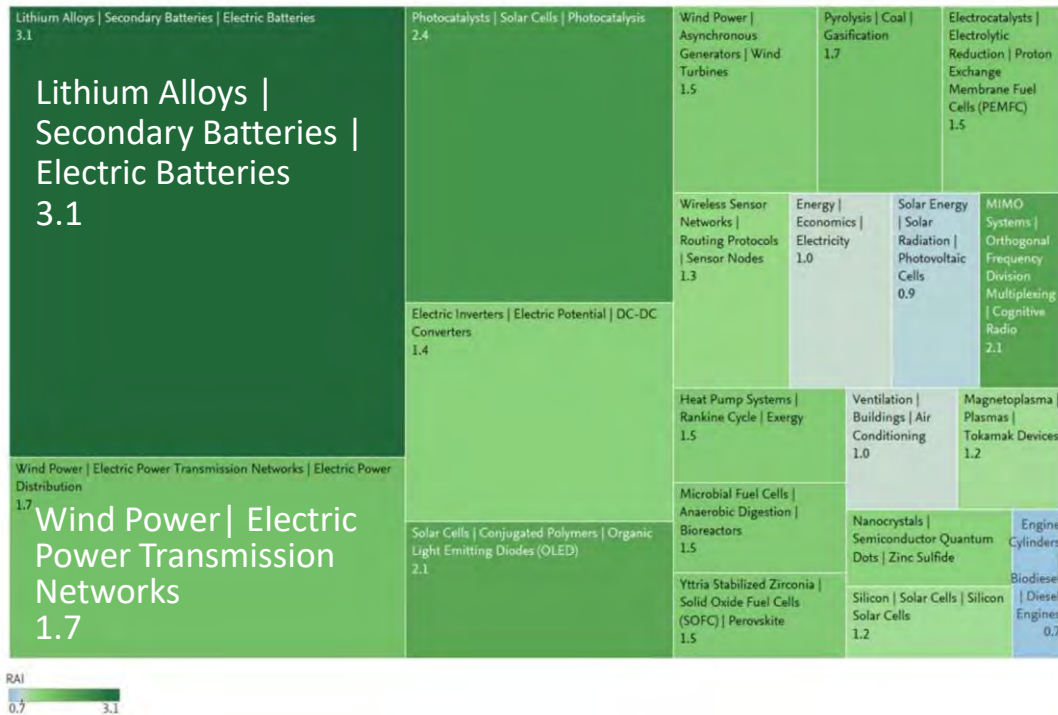


Figure 17
Top 20 topic clusters by output for China, 2011–2020. The relative activity index is indicated within the boxes.
Source: Scopus

UNITED STATES

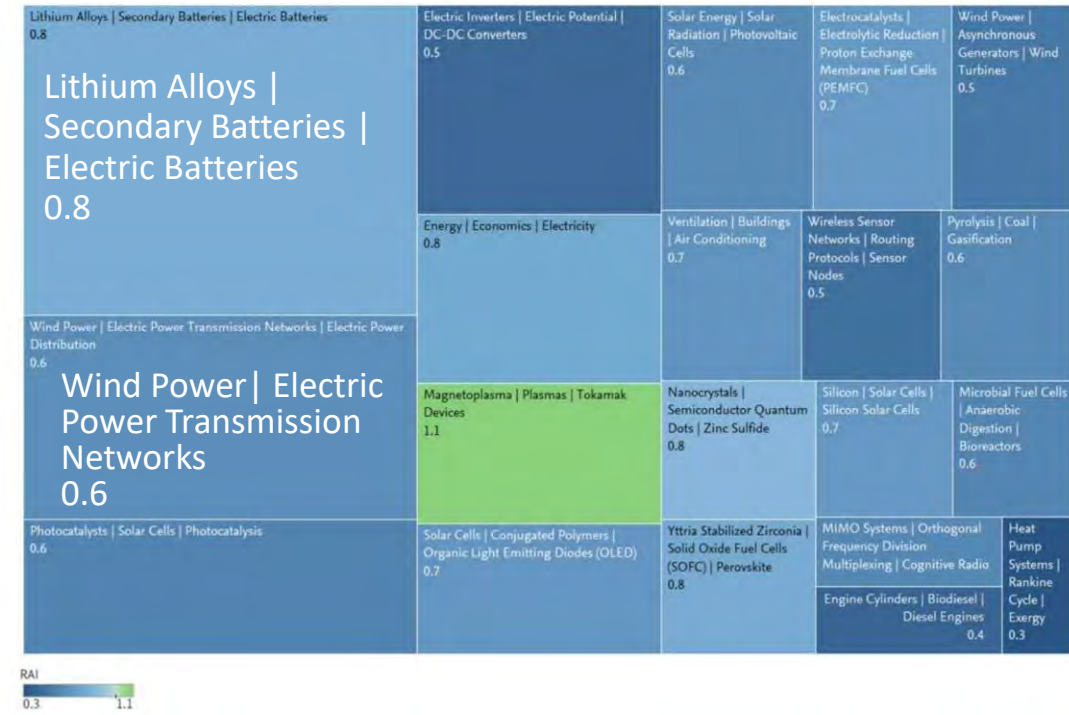
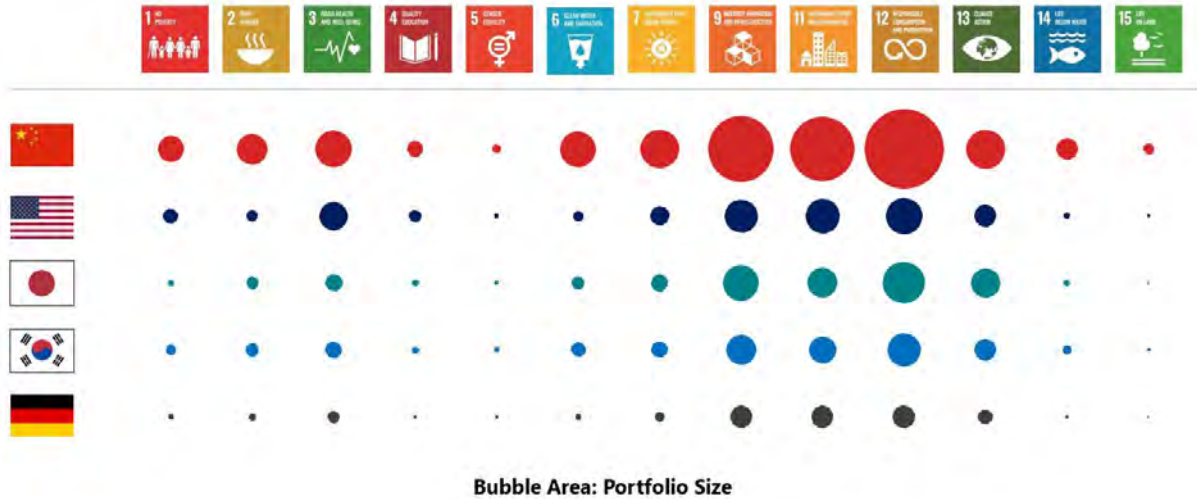


Figure 18
Top 20 topic clusters by output for the United States, 2011–2020. The relative activity index is indicated within the boxes.
Source: Scopus

- China, which produced the most NetZero Energy publications, is most strongly represented in Lithium Alloys.
- The US is relatively less specialized in most of the topic clusters in which it is most highly represented which the exception of Magnetoplasma / Plasmas

1d. Benchmark research performance: Innovation

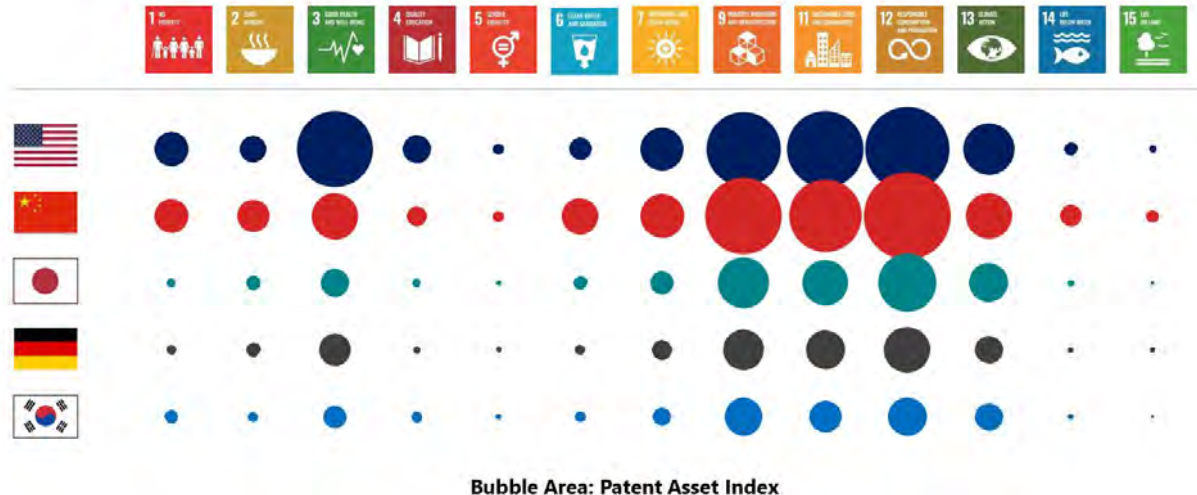
Patent quantity across UN SDGs for Top 5 authorities



The largest concentration of patents from China are focused on SDGs

- 9 - Industry, Innovation and Infrastructure
- 11- Sustainable Cities and Communities
- 12- Responsible Consumption and Production.

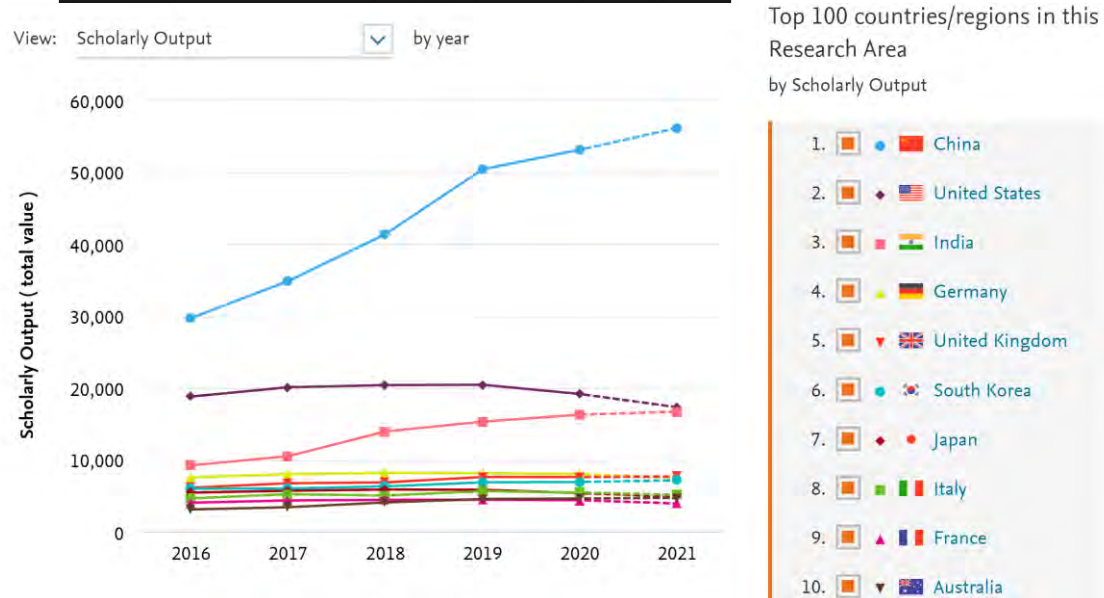
Patent quality across UN SDGs for Top 5 authorities



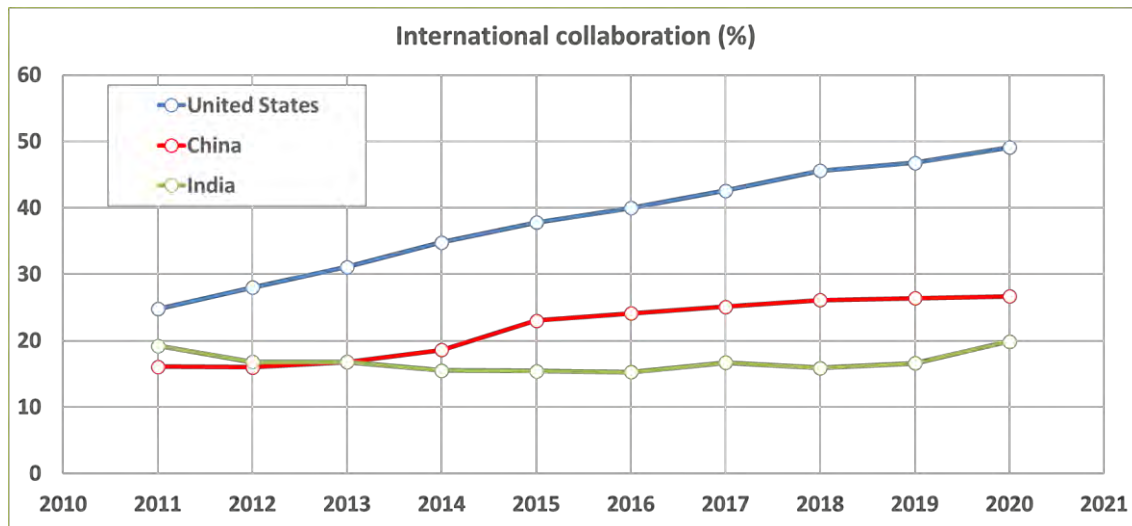
The United States has parity in quality of patents across SDGS 9, 11, and 12, as well as highest quality in SDG #3 – Good Health and Wellbeing.

2a. Deepen understanding of international collaboration

SDG #7 Scholarly Output by region



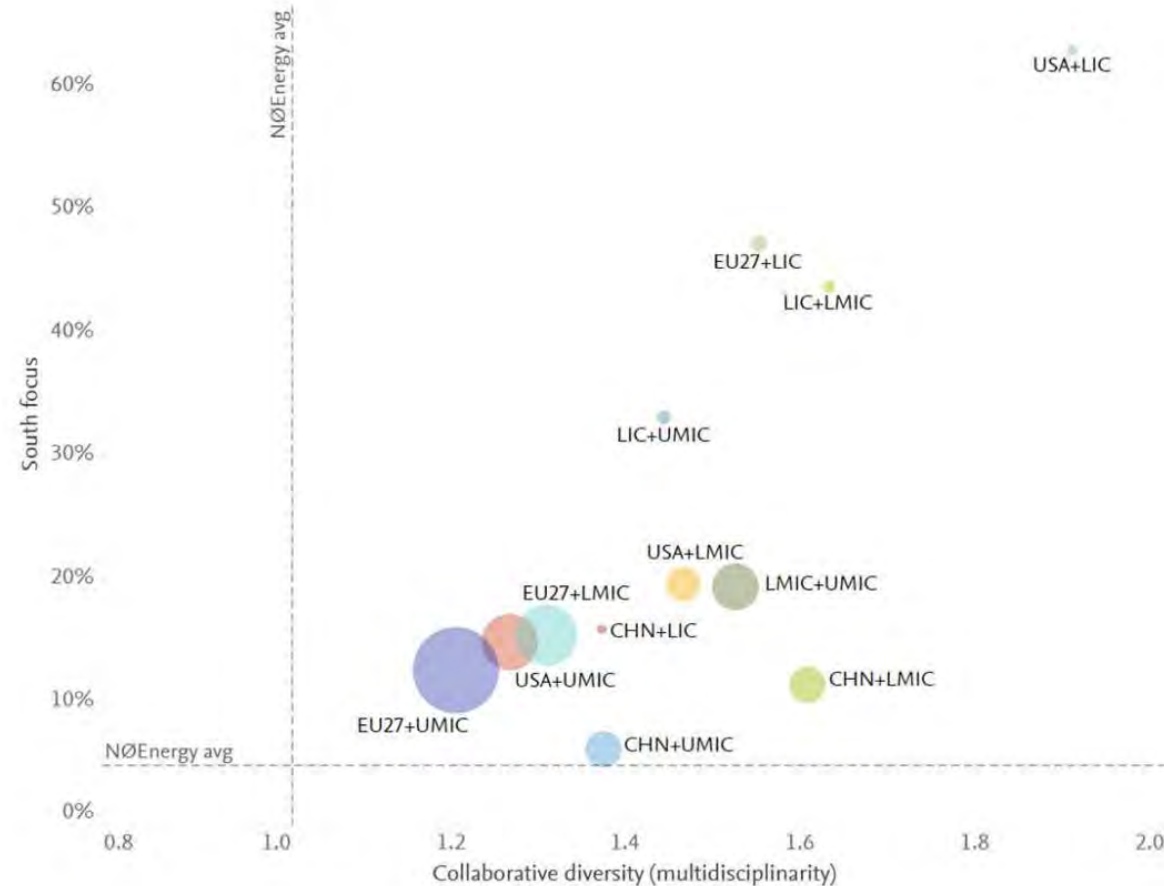
- Among the SDG7 publications with authors in the U.S. 49% have authors in another country; China is 27%. The UK is at 70%.
- Publications with authors in the U.S. have a higher FWCI than those with authors in China.
- Publications with authors in the U.S. have a higher percentage of academic-corporate co-authorship (6.4%) than those with authors in China (4.6%).



Source: Scopus, SciVal

2b. Deepen understanding of international collaboration

Collaborative diversity and percentage share of Net Zero Energy publications with a Global South study location



- All North-South and South-South Net Zero Energy publications had high or very high levels of multi-disciplinarity (scores range from 1.2-1.9)
- Regional engagement was also high or very high in almost all collaborations (except for China+UMIC which is only 6%)

Figure 31
Collaborative diversity and percentage share of NØEnergy publications with a Global South study location, 2011–2020.
Bubble size represents output volume of the collaboration type.
Source: Scopus

3a. Support SDG awareness: impact

PROFESSIONAL CAMPUS JOBS EVENTS RANKINGS STUDENT SOLUTIONS

Impact Rankings 2021

The *Times Higher Education* Impact Rankings are the only global performance tables that assess universities against the United Nations' Sustainable Development Goals (SDGs). We use carefully calibrated indicators to provide comprehensive and balanced comparison across four broad areas: research, stewardship, outreach and teaching.

The 2021 Impact Rankings is the third edition and the overall ranking includes 1 118 universities from 94 countries/regions.

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EXPLORE IMPACT RANKINGS FOR INDIVIDUAL SD

OVERALL RANKING

1

NO POVERTY

2

ZERO HUNGER

3

GOOD HEALTH AND WELL-BEING

4

QUALITY EDUCATION

9

10

11

12

13

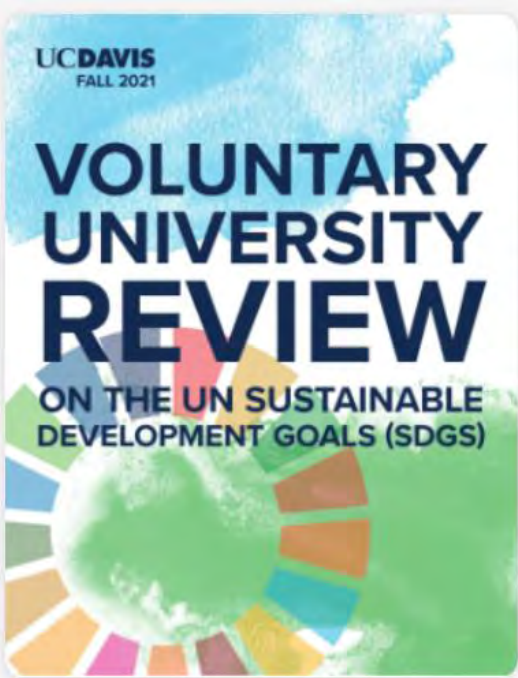
Climate change and ecosystems of the Southwestern United States

Steven R. Archer, Katharine J. Predick

Natural Resources and the Environment, School of, Arid Lands Resources Sciences - GDP, Remote Sensing / Spatial Analysis - GDP, Global Change - GDP

Research output: Contribution to specialist publication > Article

96
Scopus citations



Operationalizing Sustainable Development Requires



Adaptation of the SDG framework to inform

- National competitiveness
- Environmental protection
- Social justice
- Equity and Inclusion

Data-driven approaches to assess and steer

- Research output and impact
- Topical focus including interdisciplinary research
- International collaboration
- Grand Challenges and institutional activity

Thank You

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[Pathways to Net Zero Report](#)