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Scopus

Shaping European universities through means of mobility and collaboration

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In partnership with eurodoc
The European Council of Doctoral Candidates and Junior Researchers

Researcher Mobility

Research mobility **on the rise** - **a critical part of the knowledge and innovation transfer** process.

Within the ERA, it's **critical towards achieving an open labour market** for researchers

International mobility **is frequent, but not the dominant career path**: only ca 1/3 of all researchers still active 15 yrs after their first publication having switched country at least once during this time frame.

Researcher mobility analysis can reveal how talent flows, combines, influences local research output/impact.

Is there a tangible difference between the scientific output and impact of mobile researchers compared to static researchers?

Methodology: Scopus author profile data to derive the history of active authors.
Based on the affiliations recorded in each author's published articles over time, authors are assigned to a mobility class defined by the type and duration of observed moves.

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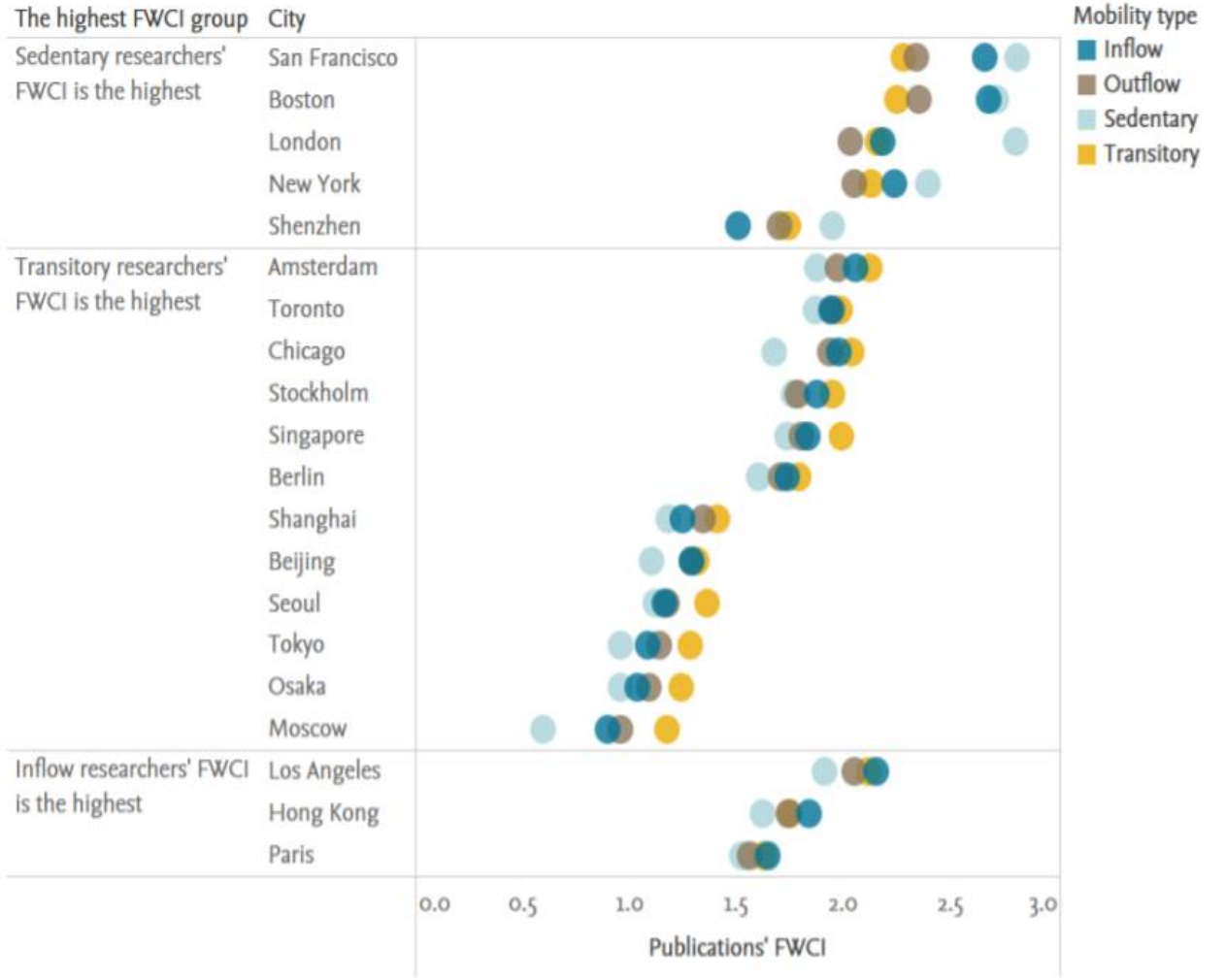

FIGURE 2-2 FWCI of different researcher mobility groups in the 20 global cities (1996–2020).
Source: Scopus

Elsevier's *Comparative Research Report of 20 Global Cities (1996-2020)*

For 12 of the 20 cities, **"transitory" researchers had a higher FWCI,** indicating that the scientists who moved were, on average, more highly cited than those who did not.

Sedentary (static): researchers who have not published with affiliations outside one country.

Transitory (mobile): researchers who stay for less than two years, after which they depart

Outflow (Brain Drain): researchers leaving X country and not returning.

Inflow (Brain Gain): researchers who entered X country and did not leave.

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Strong evidence in the literature that **mobility generates citations**. Data do point towards increases in impact metrics after the first mobility event

Data on mobile and non-mobile cohorts illustrate that mobile researchers appear to present with **higher scientific productivity** (i.e. more papers published) and **higher scientific impact** (i.e. more citations received and publishing in higher impact journals) compared to their static colleagues. These findings hold true **for most countries and across all fields of science**, at varying levels.

At the level of the EU-27, mobility generated an **increase of citations ranging from 20 % to 60 %** depending on the indicator, with the most important gains being observed for the share of publications in the 1 % most cited

Source: ***Provision and analysis of key indicators in research and innovation. Policy brief F – Scientific mobility.*** *Written by Guillaume Roberge and David Campbell, March 2021. This document has been prepared for the European Commission.*

Table 1 **Share of researchers never experiencing international mobility during their publishing career**

Countrv	Country code	% Non-mobile
World		**66%**
ERA		**61%**
EU–27		**63%**
Belgium	BE	47%
Bulgaria	BG	62%
Czech Republic	CZ	67%
Denmark	DK	54%
Germany	DE	53%
Estonia	EE	65%
Greece	EL	60%
Spain	ES	70%
France	FR	59%
Croatia	HR	76%
Ireland	IE	38%
Italy	IT	69%
Cyprus	CY	41%
Latvia	LV	73%
Lithuania	LT	75%
Luxembourg	LU	30%
Hungary	HU	58%
Malta	MT	32%
Netherlands	NL	55%
Austria	AT	47%
Poland	PL	77%
Portugal	PT	64%
Romania	RO	67%
Slovenia	SI	73%
Slovakia	SK	57%
Finland	FI	64%
Sweden	SE	54%
United Kingdom	UK	48%
Iceland	IS	47%

Country	Country code	% Non-mobile
World		**66%**
ERA		**61%**
EU–27		**63%**
Liechtenstein	LI	57%
Norway	NO	63%
Switzerland	CH	35%
Israel	IL	49%
Montenegro	ME	61%
Macedonia	MK	54%
Albania	AL	43%
Serbia	RS	69%
Turkey	TR	78%
Kosovo	XK	44%
Bosnia and Herzegovina	BH	49%
Armenia	AM	57%
Azerbaijan	AZ	64%
Belarus	BY	56%
Georgia	GE	55%
Rep. of Moldova	MD	48%
Ukraine	UA	63%
Faroe Islands	FO	36%
Tunisia	TN	63%
Brazil	BR	71%
Canada	CA	46%
China	CN	72%
India	IN	67%
Japan	JP	71%
South Korea	KR	61%
Russia	RU	77%
South Africa	ZA	56%
United States	US	69%
Australia	AU	52%

Note: Cohort of 2001–2003 still publishing 15 years later. Colour coding ranges from dark green for the lower proportions to dark red for the largest proportions, with proportions on par with the world level coloured white. The presented countries include those from the EU-27 and the European Research Area (ERA), plus INCO–EU countries.
Source: Prepared by Science-Metrix using the Scopus database (Elsevier)

Regional patterns:

Northern and western European Member States ranked highest in terms of mobility destinations (accounting for sources within and beyond the EU-27), while eastern European nations nearly always ranked lowest.

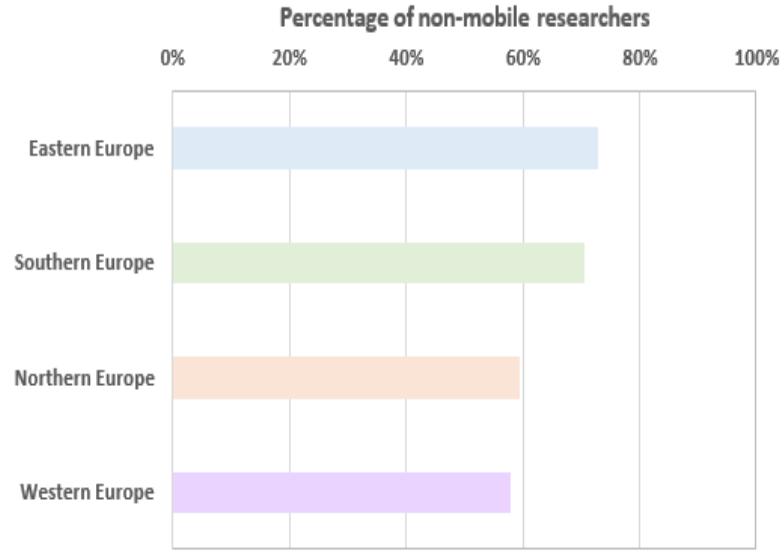

Figure 1 **Percentage of non-mobile researchers per EU-27 region**

Note: Cohort of 2001–2003 still publishing 15 years later. Scores for regions are weighted proportions according to the number of researchers per country. Therefore, countries with more individuals have higher weights in the computation than those with fewer individuals.
Source: Prepared by Science-Metrix using Scopus data (Elsevier)

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Table 2 **Mobility counts of researchers experiencing mobility events only in the first five years of their publishing career**

Country	Leaving	Arriving	Net balance	Net balance /Leaving
Belgium	201	276	75	37%
Bulgaria	32	53	21	66%
Czechia	56	112	56	100%
Denmark	127	187	60	47%
Germany	958	1,401	443	46%
Estonia	6	21	15	250%
Greece	77	183	106	138%
Spain	300	549	249	83%
France	845	1,177	332	39%
Croatia	28	43	15	54%
Ireland	89	167	78	88%
Italy	425	605	180	42%
Cyprus	2	14	12	600%
Latvia	1	6	5	500%
Lithuania	20	25	5	25%
Luxembourg	5	17	12	240%
Hungary	45	80	35	78%
Malta	8	4	-4	-50%
Netherlands	292	505	213	73%
Austria	101	219	118	117%
Poland	93	138	45	48%
Portugal	65	149	84	129%
Romania	51	69	18	35%
Slovenia	8	41	33	413%
Slovakia	37	37	0	0%
Finland	55	111	56	102%
Sweden	188	314	126	67%
United Kingdom	1,633	1,994	361	22%
Iceland	10	17	7	70%
Liechtenstein	0	1	1	-
Norway	74	158	84	114%
Switzerland	282	469	187	66%
Israel	184	149	-35	-19%
Montenegro	5	3	-2	-40%
North Macedonia	7	22	15	214%
Albania	0	2	2	-
Serbia	26	42	16	62%
Turkey	87	247	160	184%
Kosovo	0	3	3	-
Bosnia and Herzegovina	4	18	14	350%
Armenia	8	7	-1	-13%
Azerbaijan (non-ERA)	3	8	5	167%
Belarus (non-ERA)	24	27	3	13%
Georgia	10	15	5	50%
Moldova	3	3	0	0%
Ukraine	73	75	2	3%
Faroe Islands	0	0	0	-
Tunisia	17	52	35	206%
Brazil	184	345	161	88%
Canada	811	1,233	422	52%
China	539	1,089	550	102%
India	346	333	-13	-4%
Japan	647	794	147	23%
South Korea	177	497	320	181%
Russian Federation	239	382	143	60%
South Africa	94	124	30	32%
United States of America	3,839	5,846	2,007	52%
Australia	408	700	292	72%

Note: Cohort of 2001–2003 still publishing 15 years later. Colour coding ranges from dark red for the largest negative net gains to dark green for the largest positive net gains, with neutral balances appearing in white. The sum of balances is not neutral because although a researcher can only be counted once under the 'Leaving' category, this loss can be counted multiple times if the researcher moved to multiple countries over the course of the first five years.
Source: Prepared by Science-Metrix using the Scopus database (Elsevier)

INTERNATIONAL MOBILITY OF EARLY CAREER INDIVIDUALS (UNDERGRADUATE AND GRADUATE STUDENTS)

Many of the mobility events are most certainly attributable to trainees studying abroad and coming back. Focusing the analysis on mobile researchers who moved in the training stage (i.e. in the 5yrs following their first publication), we identified **7% of the 34 % who experienced at least one migratory event in their whole career** (66 % of researchers still active after 15yrs never experienced any migration external to the first country)

Career stage findings:

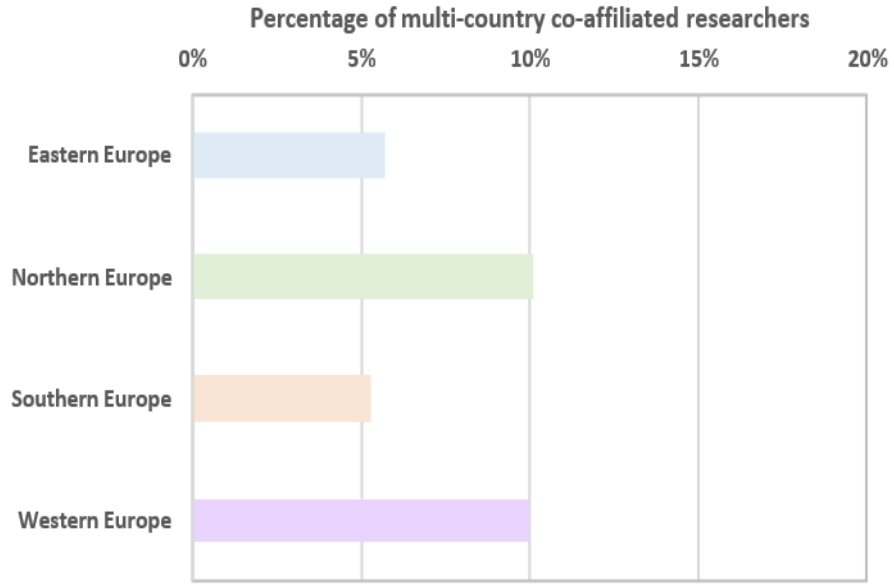


Figure 2 **Percentage of researchers affiliated to more than one country in their first publication year, by EU-27 regions**

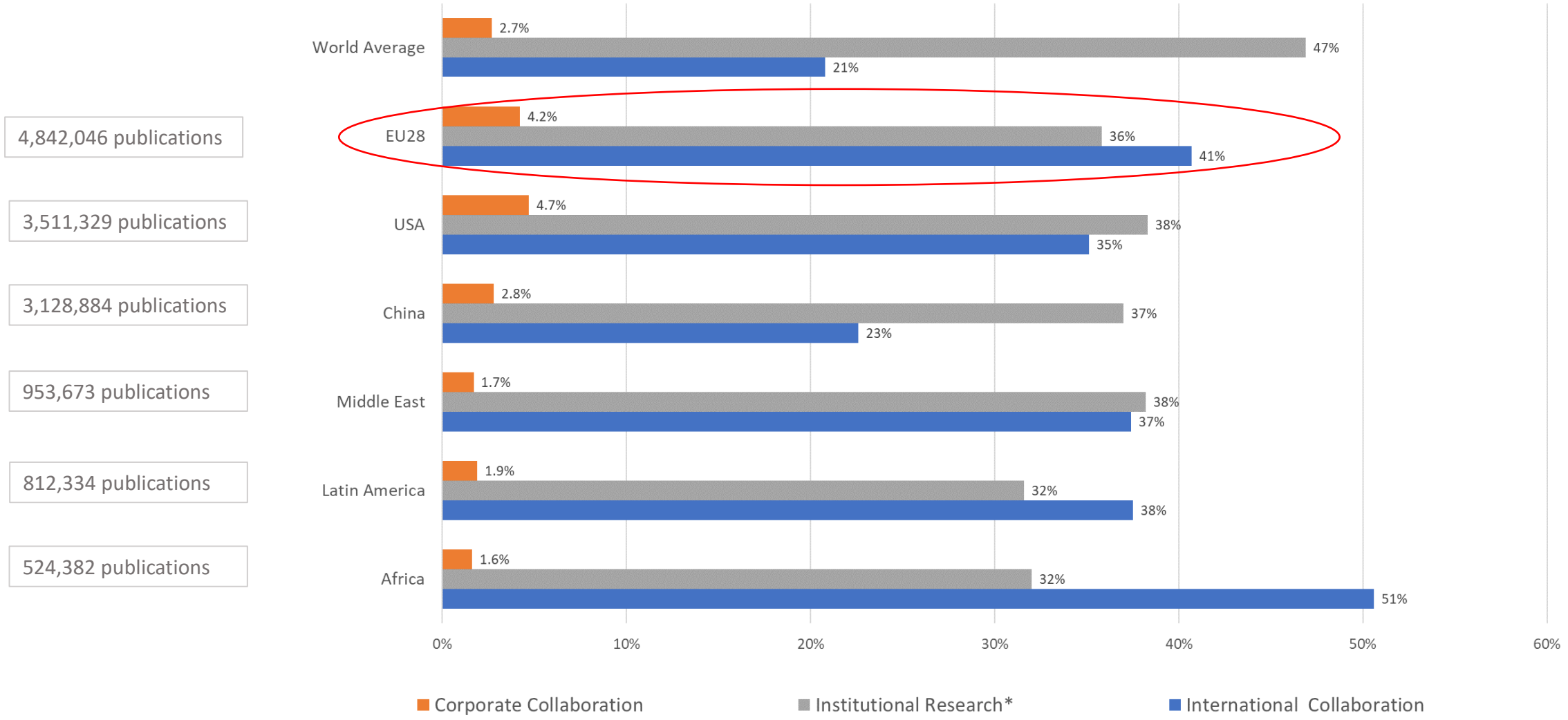
Note: Cohort of 2001–2003 still publishing 15 years later. Regional scores are weighted proportions, in accordance with the number of researchers per country.
Source: Prepared by Science-Metrix using Scopus data (Elsevier)

(~80 %) of students or young researchers acting as authors on at least one publication end up leaving academia after a few years.

There is a **positive correlation between multi-country co-affiliations in the training period and subsequent mobility**, when looking at results across highly mobile and highly non-mobile country populations.

Individuals who are mobile during the early training years are much more likely to stay in research. Policies fostering greater mobility in this critical phase of a researcher's career (e.g., through cotutelles) could be considered to increase the retention of graduate/post-graduate students in research.

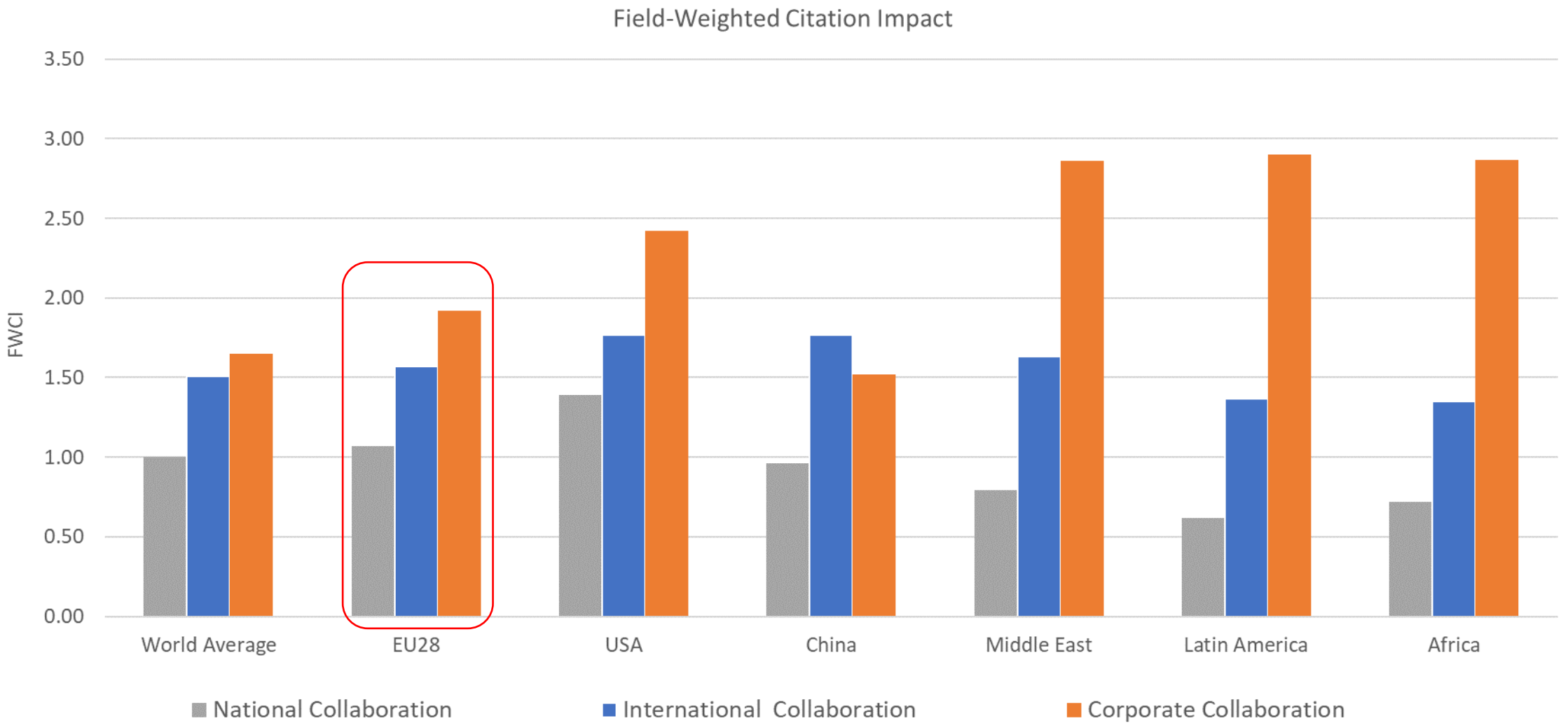
Institutional, international and corporate collaboration- international comparisons



* One or more authors from the same University, no other institution involved

Publications years 2016-2020

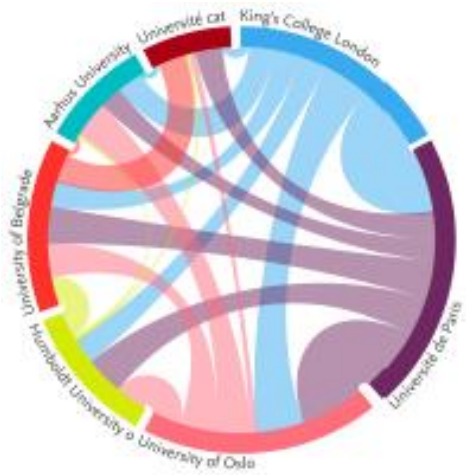
Institutional, international and corporate collaboration and research quality- international comparisons



Publications years 2016-2020

Monitoring collaboration across alliances and networks addressing the societal challenges

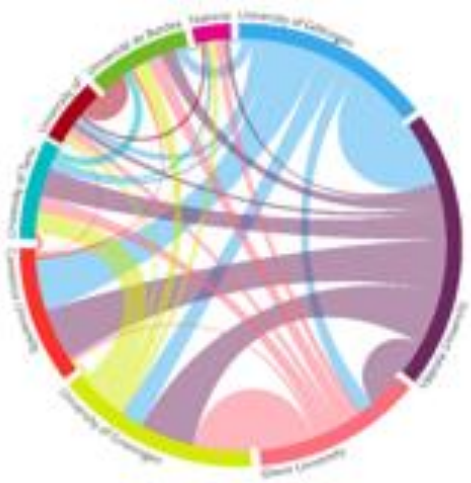
Collaboration within alliances and networks



Circle U.
European University Alliance

- King's College London
- Université de Paris
- University of Oslo
- Humboldt University of Berlin
- University of Belgrade
- Aarhus University
- Université catholique de Louvain

There is **significant collaboration between all members of Circle** UE as shown by this chord diagram. Within the time period analyzed, Université de Paris is the most intensive in terms of co-publications with other Circle U members, followed by King's College London



ENLIGHT

- University of Göttingen
- Uppsala University
- Ghent University
- University of Groningen
- Comenius University
- University of Tartu
- University of the Basque Country
- Université de Bordeaux
- National University of Ireland, Galway

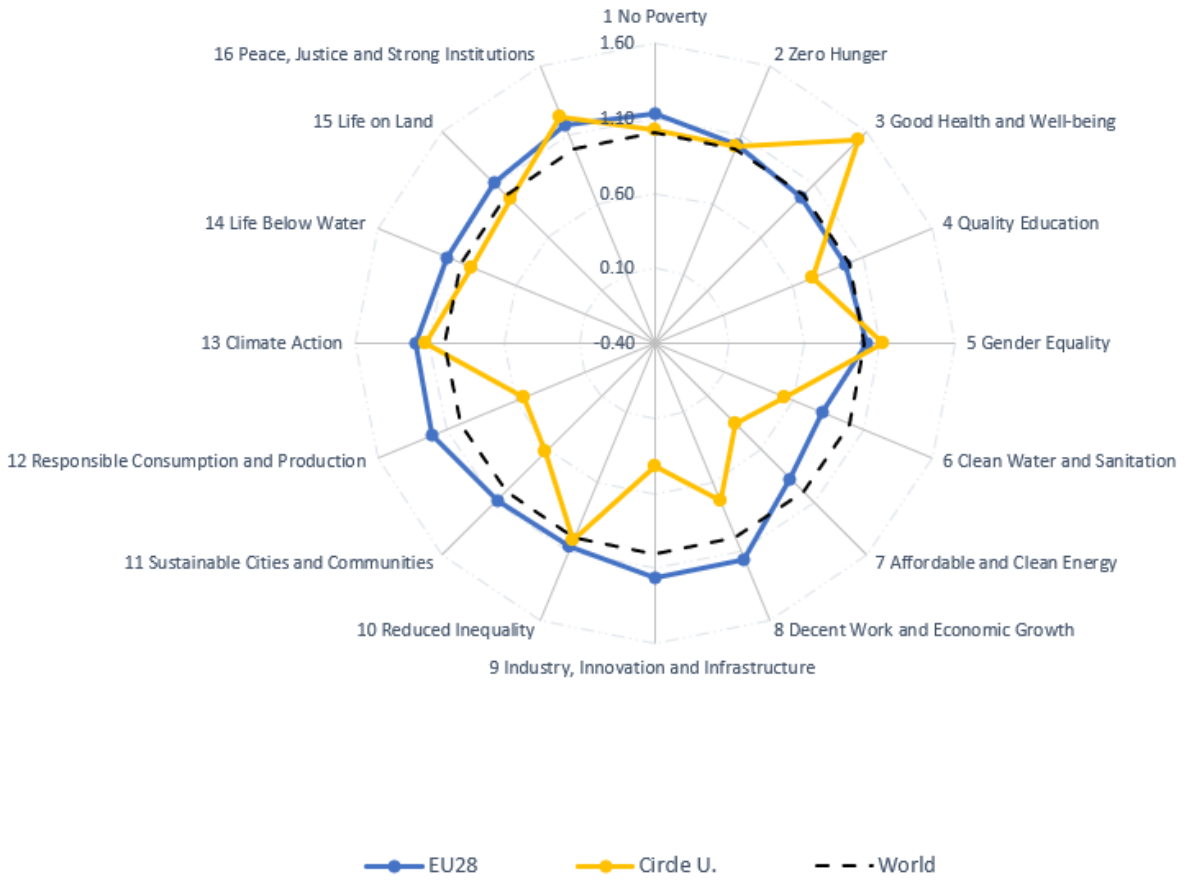
There is **intensive collaboration between all members of ENLIGHT** as shown by this chord diagram. over the period. The most prolific in terms of co-publications are University of Göttingen and Uppsala University with 811 co-publications over the period, followed by Ghent University and University of Groningen (714 co-publications).

Source: SciVal - *2015-2020 publications*

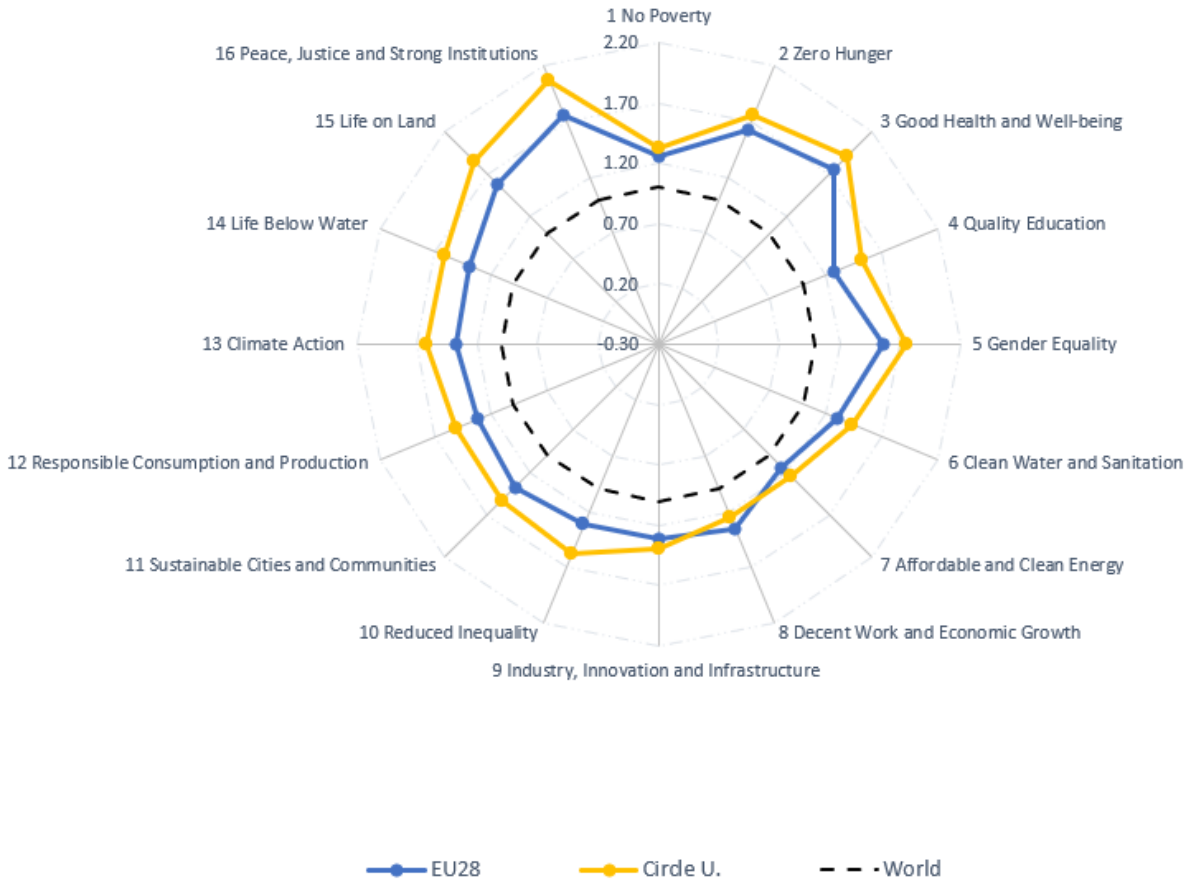
Circle U. SDGs Research | relative comparison

Circle U.
European University Alliance

Relative (Research) Activity Index



Relative Research Impact (FWCI) Index



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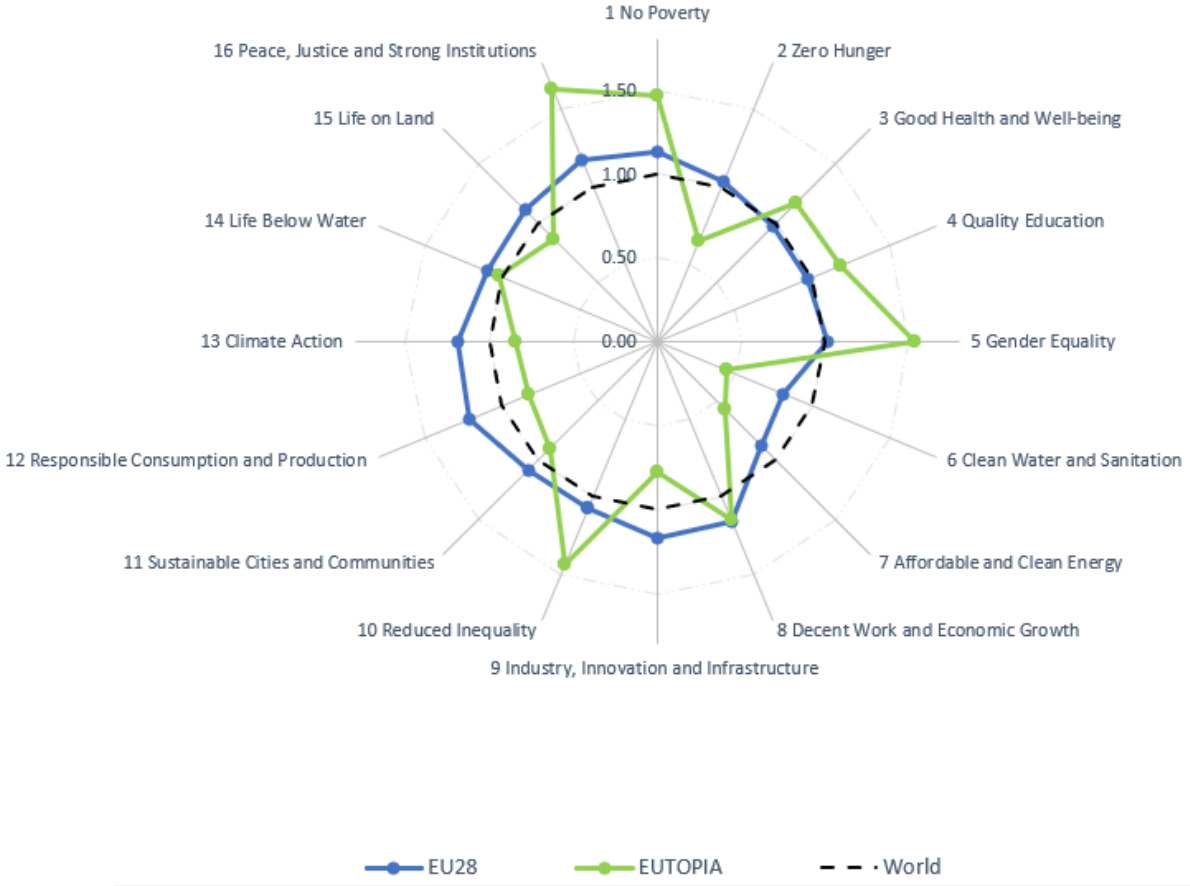
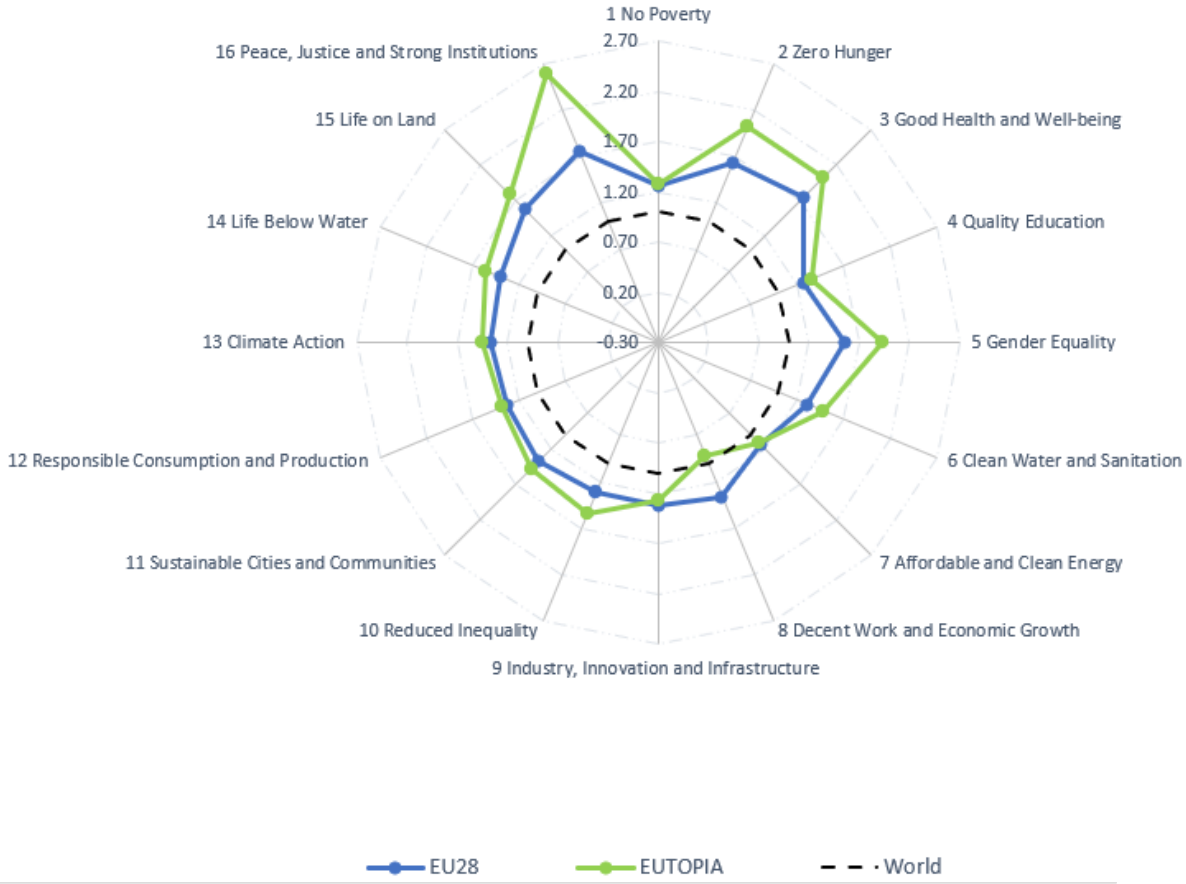
Source: SciVal - *2016-2020 publications*

EUTOPIA SDGs Research | relative comparison

Relative (Research) Activity Index

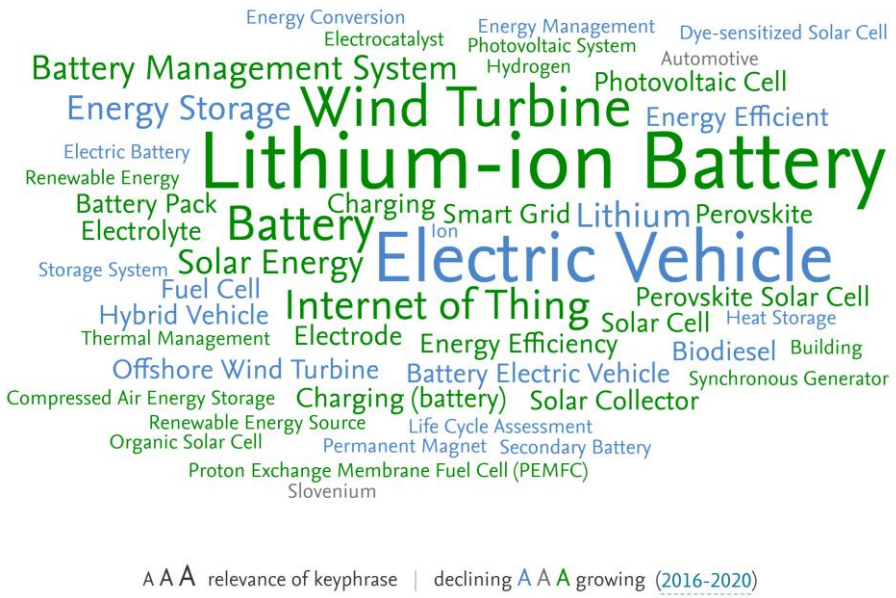


Relative Research Impact (FWCI) Index



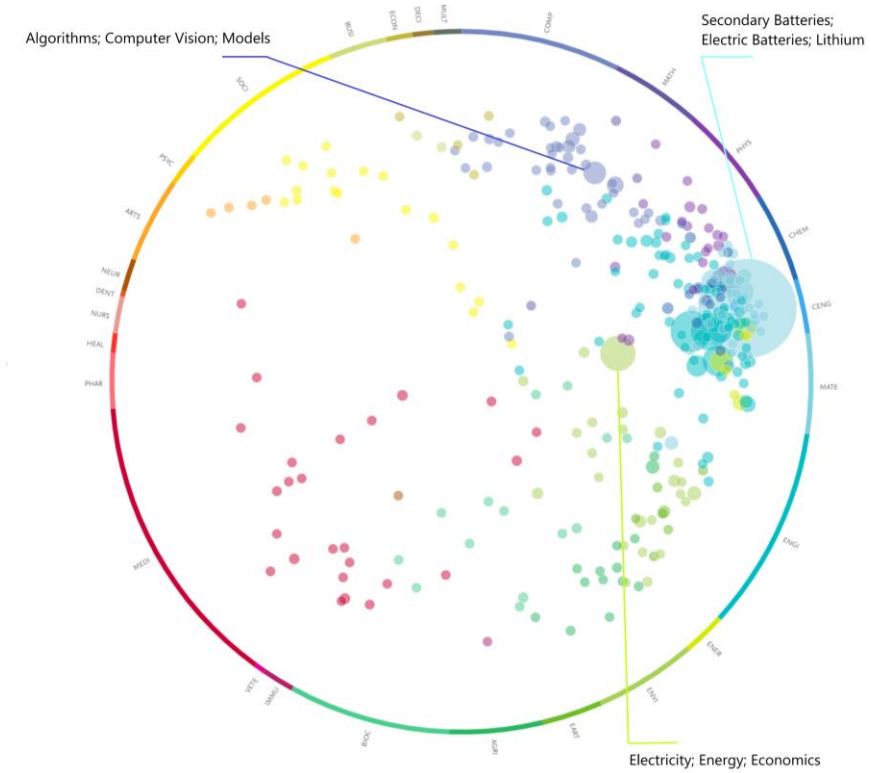
Source: SciVal - *2016-2020 publications*

Contribution of EUTOPIA to SDG 7 – Affordable and Clean Energy



The word cloud shows Top 50 keyphrases from publications by EUTOPIA members from 2016 up to now. EUTOPIA cumulative contribution to research in SDG 7 comes from a variety of disciplines, mostly from Engineering, Energy and Materials Science, as well as Physics and Astronomy.

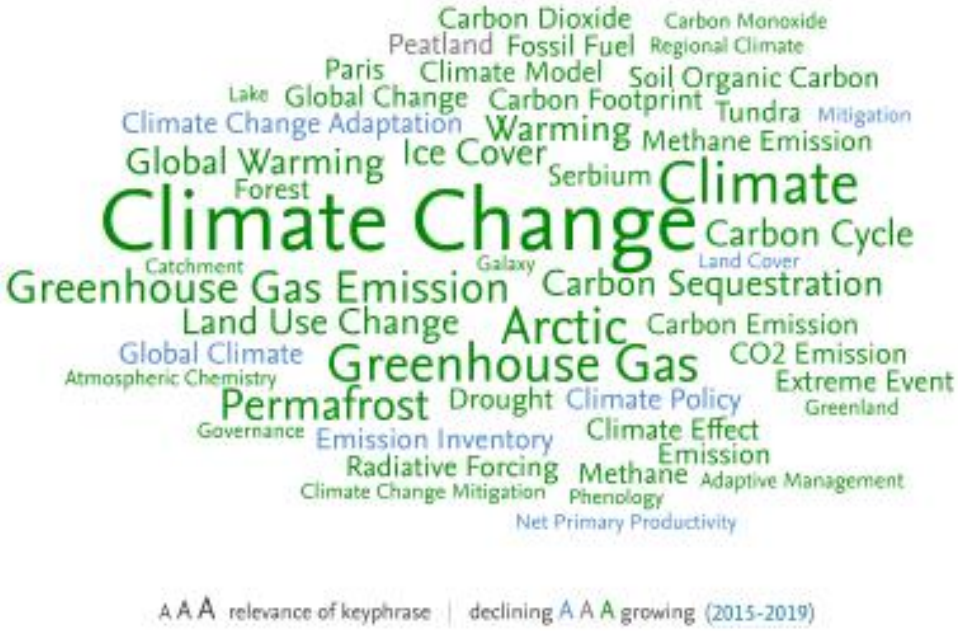
Topic Cluster analysis of EUTOPIA contribution to research in SDG 7 – Affordable and Clean energy



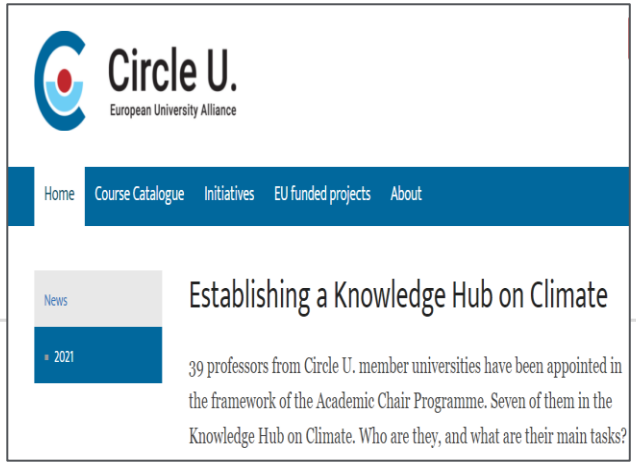
Key:
Scholarly Output = Size of circle
Subject area contribution to Topic = Colour of circle
Level of multidisciplinarity: circle closer to centre of wheel

Source: SciVal - *2015-2020 publications*

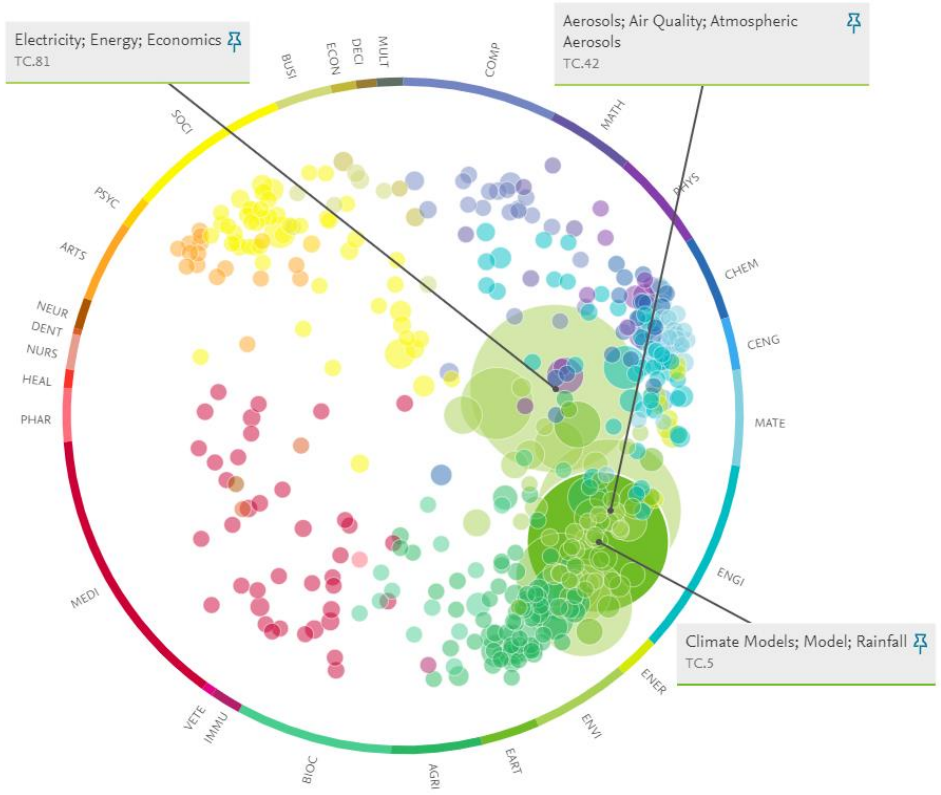
Contribution of Circle U to SDG 13 – Climate action



Top 50 key phrases from publications by Circle U members from 2015 to 2020. Circle U cumulative contribution from a variety of disciplines: Environmental Science (23%), Earth and Planetary Sciences (14.7%); Agricultural and Biological Sciences (12.4%); Social Sciences (8.4%); Energy (6.6%); Engineering (4.8%) and many others.



Topic Cluster analysis of Circle U contribution to research in SDG 13 – Climate Action



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Thank you

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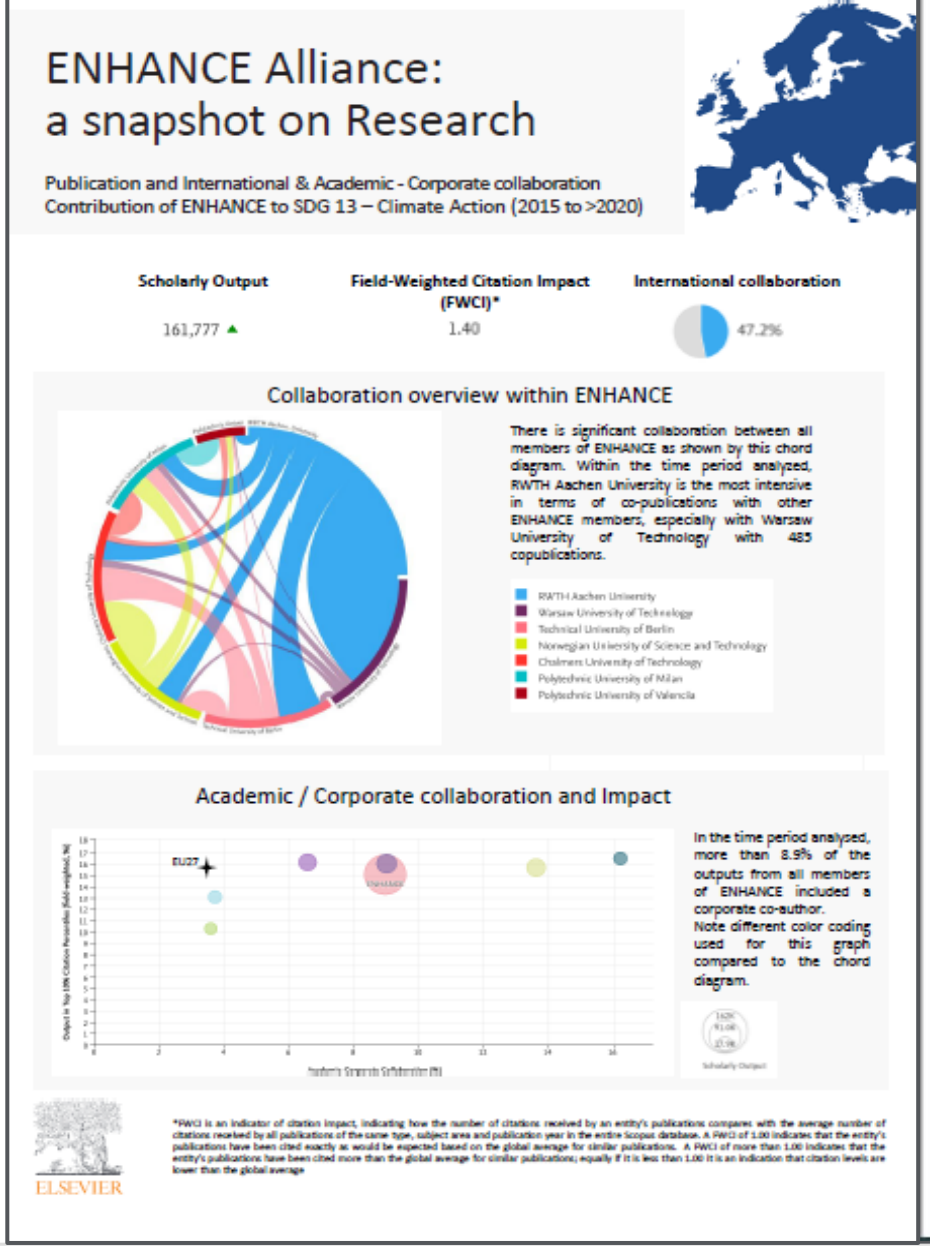

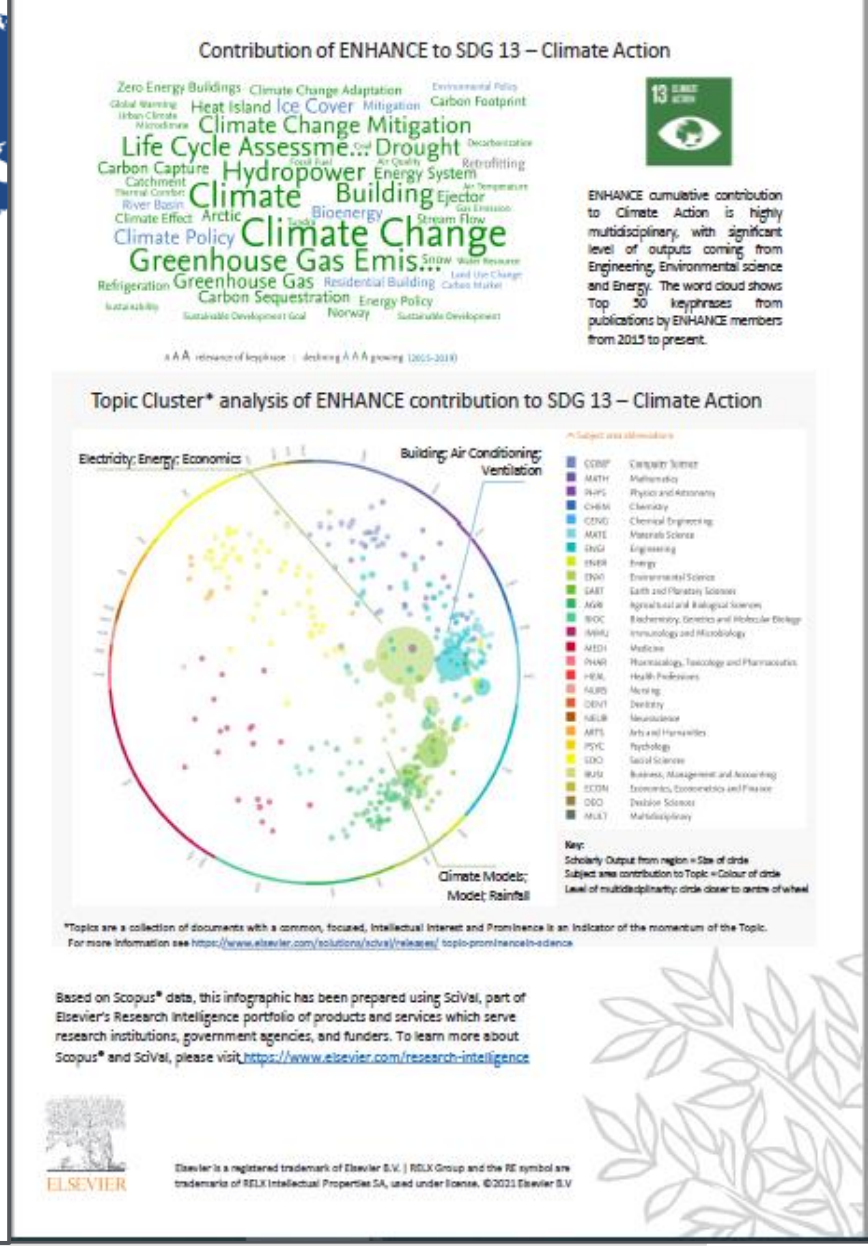

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