

# Bibliometrics in Circular Design Visual Representation



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## 1. Web of science search by 'circular design' in topic abstract and keyword

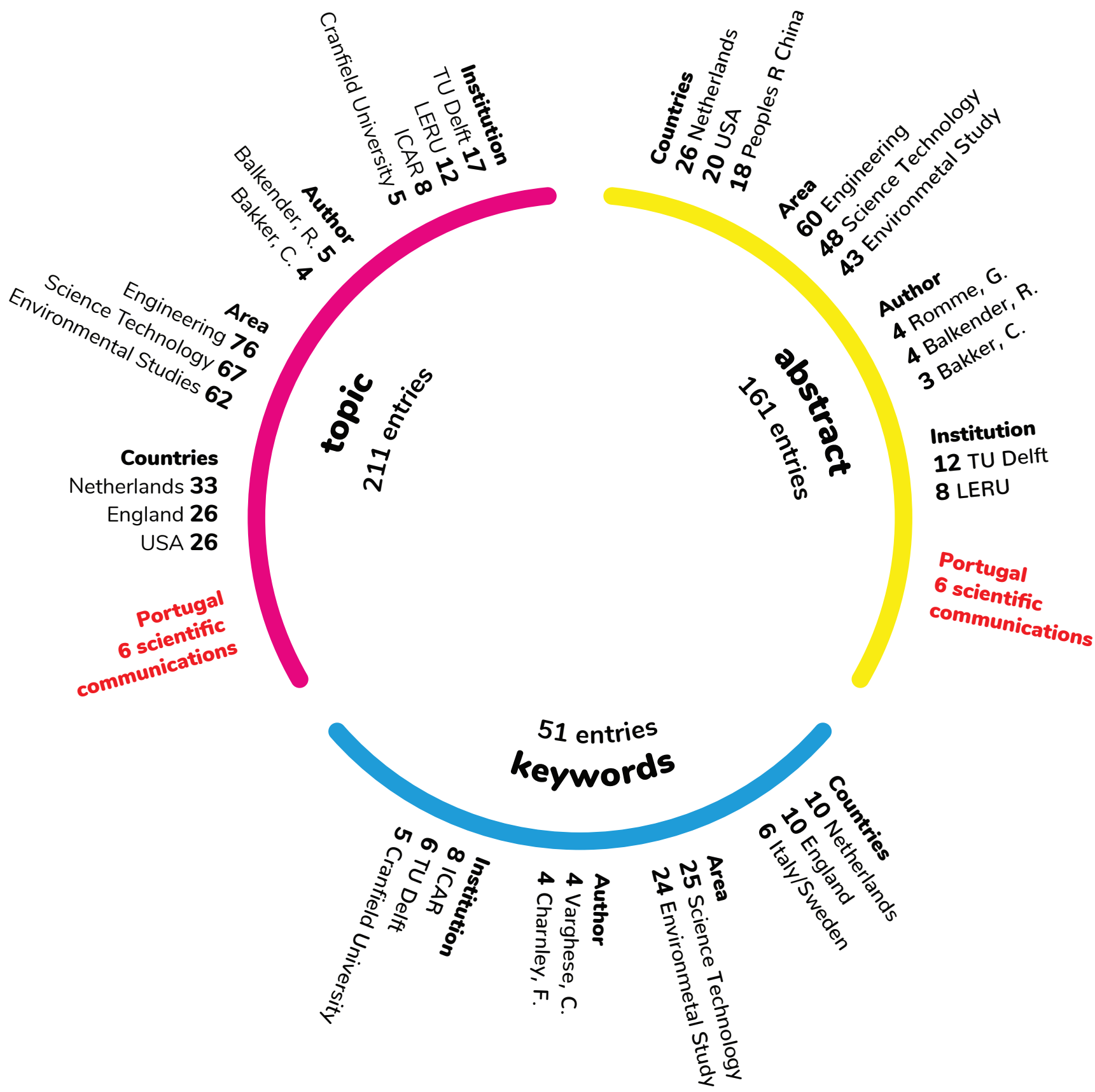


Figure 1  
 Circular map with the most relevant results in web of science by topic, abstract and keywords and Portugal comparison.  
 blue : keywords  
 magenta : topic  
 yellow : abstract  
 red : portuguese comparison

### Abstract

The main goal of this poster it represents graphically the evolution made in Circular Design Research (CDR) in Portugal and Worldwide.

This bibliometrics was generated because of the lack of information about the evolution of circular design in Portugal in quantitative parameters. The worldwide data was used to create a comprehensive framework of the state of research and used to make a comparison with the Portuguese case.

It's essential to share this information to understand the real role of design in the circular economy. As we can see, the accurate representation of design is residual, so the freshness of this field opens the possibility to Design researchers and PhD Students to develop research about the participation of Design in this field not as a tool but as a research discipline.

Understanding the tendencies of research in this area reveals the importance of Design needs to assume your position and creator of artificial innovation through aesthetics and poetics of Design, on the path to a more circular and resilient industry.

This research demonstrates that Portugal's representation (at the global level) in this area is residual, and the Netherlands assumes a position as the leader in CDR, having as its base the Database collected in Web of Science. The last 5 years represent 65% of all scientific knowledge produced in CDR, revealing the opportunity and relevance of the studies of Circular Economy in Design. Besides that, the data collected in RCAAP (Portuguese Open Access Scientific Repositories), Design has a strong position in CDR, but if you see the metrics in Web of Science the participation of Design in CDR is residual, contrary to fields like Engineering, Technology, and Environmental Sciences.

The methodology is based on data collected and analysed. We resort to Web of Science and use the term "Circular Design" in three different types of searches: Keywords, Topic and

Abstract. We collect the Data and organize them in a spreadsheet and treat the data and organize them by Author, Year, Journal, Title, Affiliation, Country, and Area of Study.

In the case of RCAAP because of the browse limitations (which don't allow us to find by Topic, Keywords and Abstract) and sample dimension, we expand the search for more 2 terms (Sustainable Design and Circular Economy – in Portuguese and English) doing the search by Topic. In the data organisation, we used the same parameters used in Web of Science search.

It's possible to conclude, based on Web of Science results that the Topic has more information entries (211), followed by Abstract (161) and Keywords (51). Findings make through Keywords it can be readied as the more important method of data collection in this type of analysis because create a direct relation in the real subject of the article.

But, in the 3 types of searches, it's possible to establish coherence in the qualitative data analysed:

- Netherlands is the most representative country in both searches and TUDelft the most representative University.
- Environmental Studies and Science Technology are represented in all searches as one of the most scientific productions in CDR.
- Design representation in Web of Science assumes a residual position
- Portugal is represented by 6 communications indexed by Web of Science.

In RCAAP database it concluded that only exist 14 PhD Thesis and 53 MsC Dissertations:

- Design has a representative position in Portugal in CDR, on par with Management and Engineering.
- The expression "Circular Economy" (in Portuguese and English) is the most expressive Keyword because of your thematic coverage.
- The PhD in Design in Portugal 2 they are made using the Methodology of Research for Design (based in Frayling).

The temporal comparison between Web of Science and RCAAP shows us that is a similarity in growth and decrease in the same time spaces.

## 2. RCAAP Search in Portuguese MSc Dissertations and PhD Thesis with Portuguese ('economia circular', 'design circular', 'design sustentável') and English ('circular economy', 'circular design', 'sustainable design') Keywords

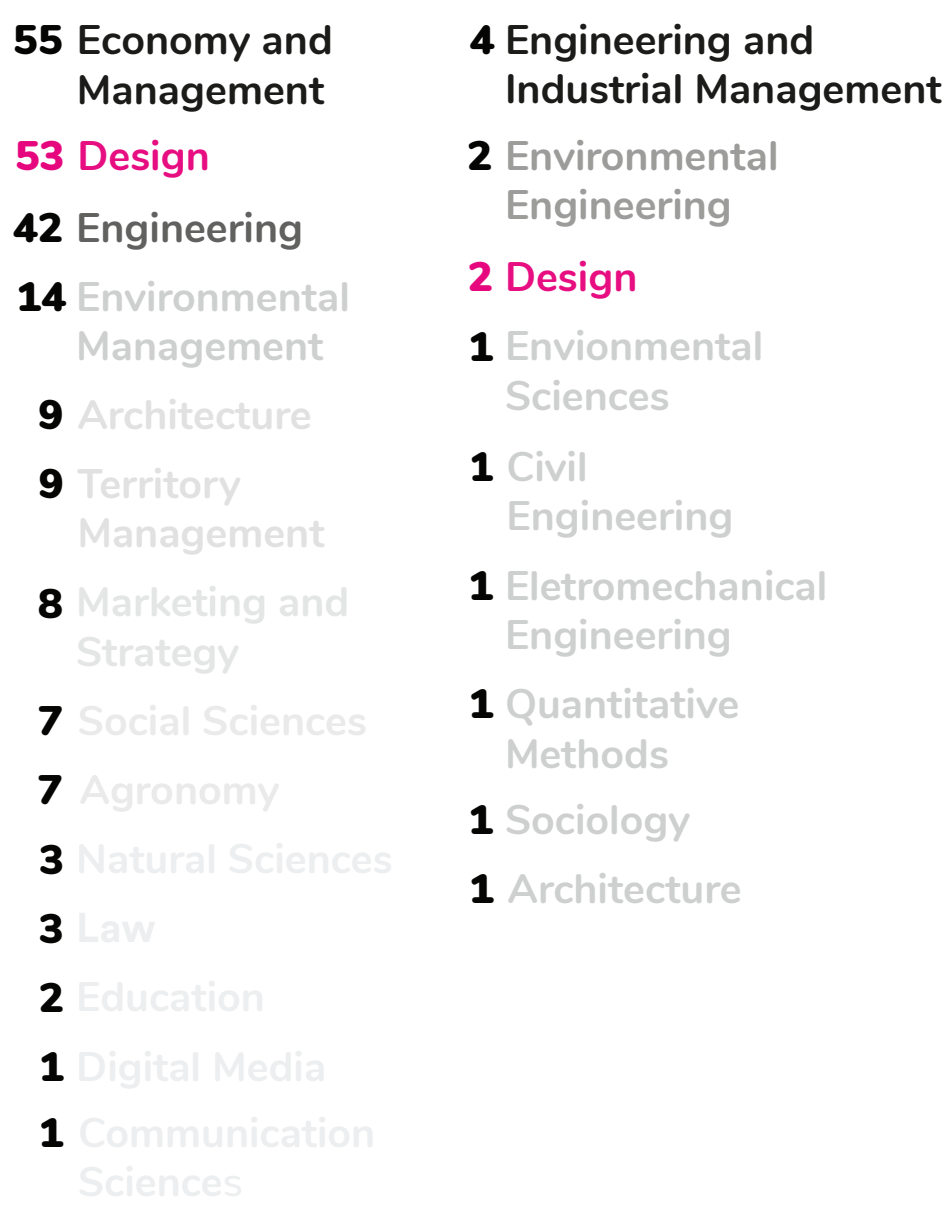


Figure 2  
 MSc Dissertations (left) and PhD thesis (right) by keywords: 'economia circular', 'design circular', 'design sustentável' and 'circular economy', 'circular design' and 'sustainable design'.  
 magenta : design metrics

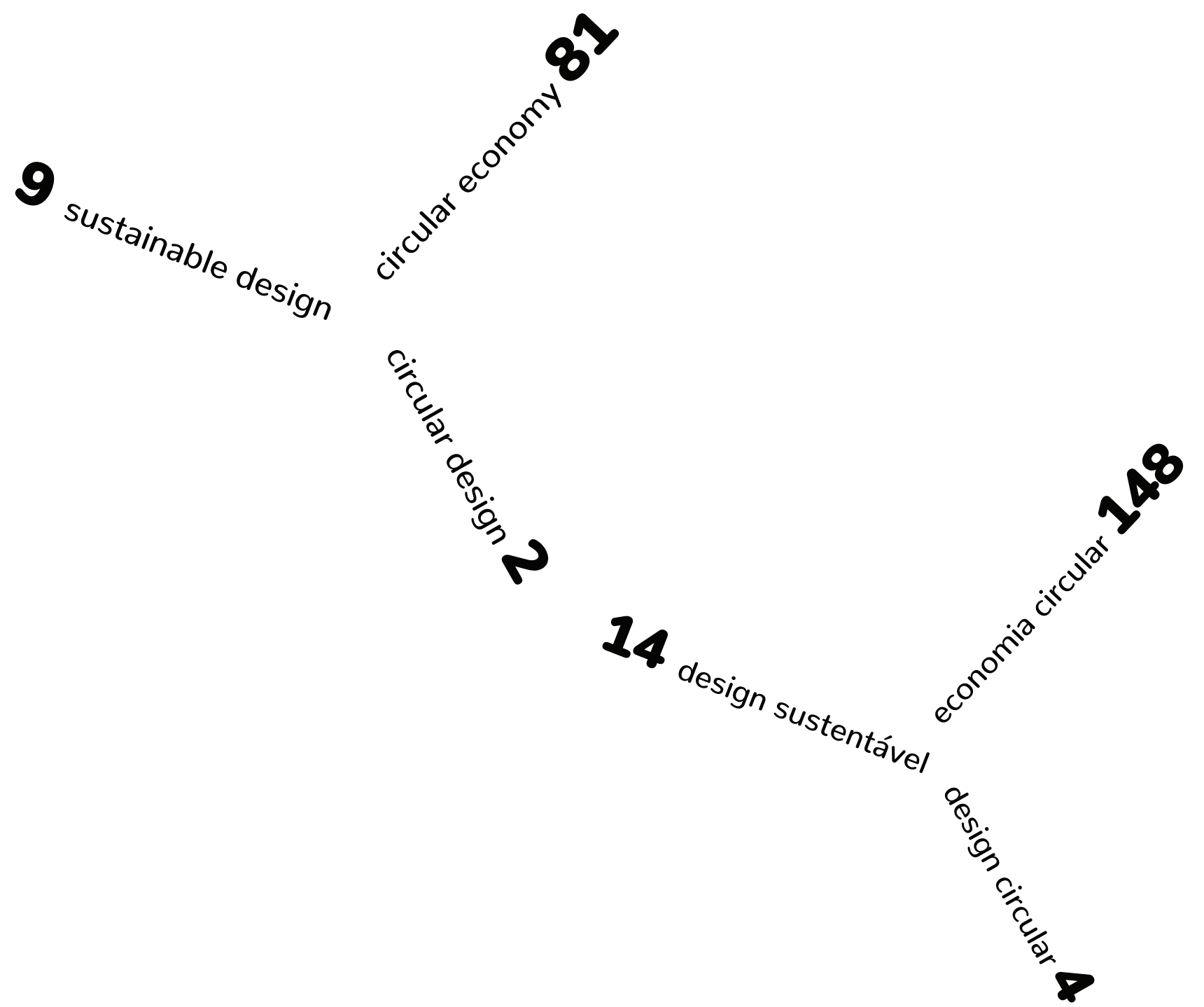


Figure 3 and 4  
 Number of keywords found in RCAAP (above)  
 Number of keywords in Portuguese found in RCAAP (below)

## 3. Comparison metrics between RCAAP and Web of Science search

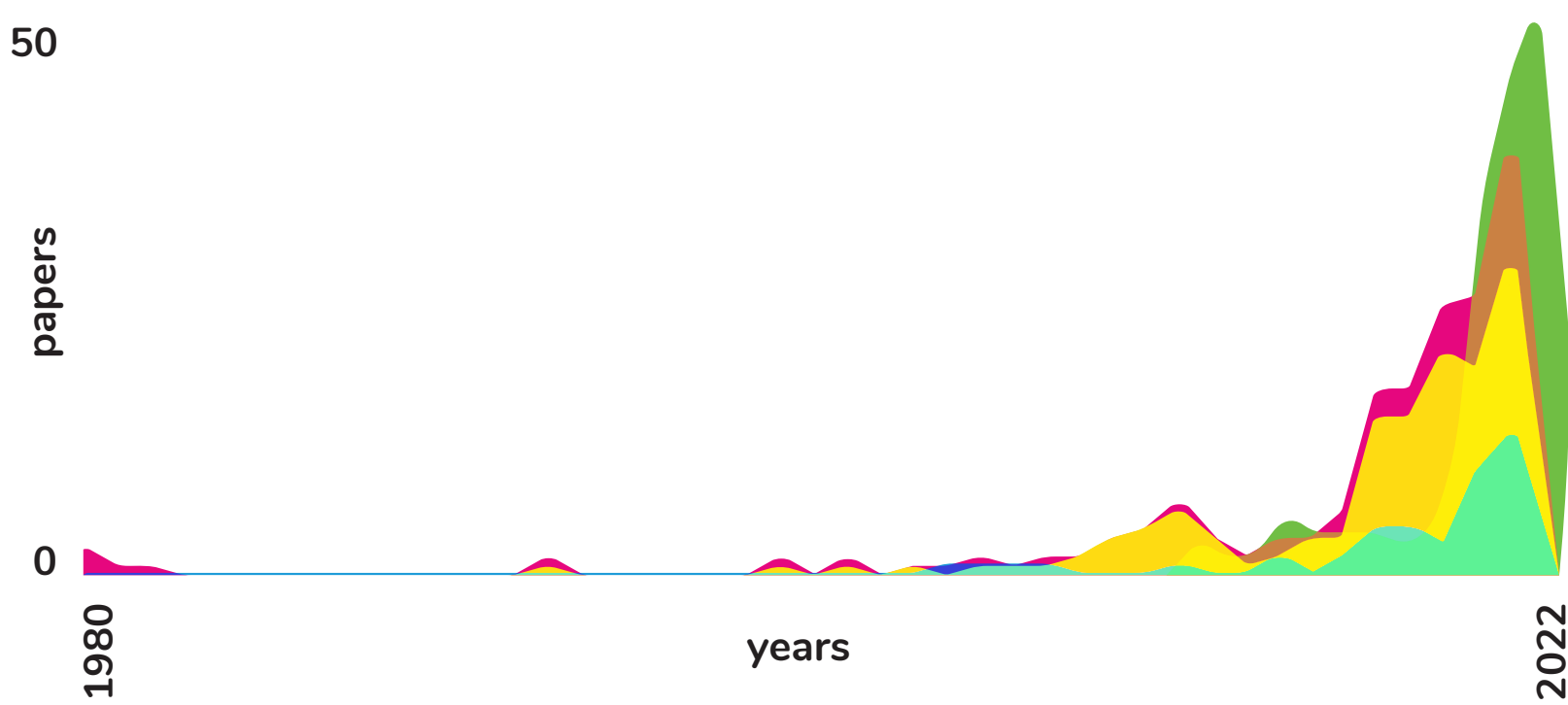


Figure 5  
 Comparison and evolution of terms in Portugal by RCAAP and in the world by Web of Science  
 blue : keywords  
 magenta : topic  
 yellow : abstract  
 green : RCAAP metrics

## 4. Comparison between number of papers by topic per country

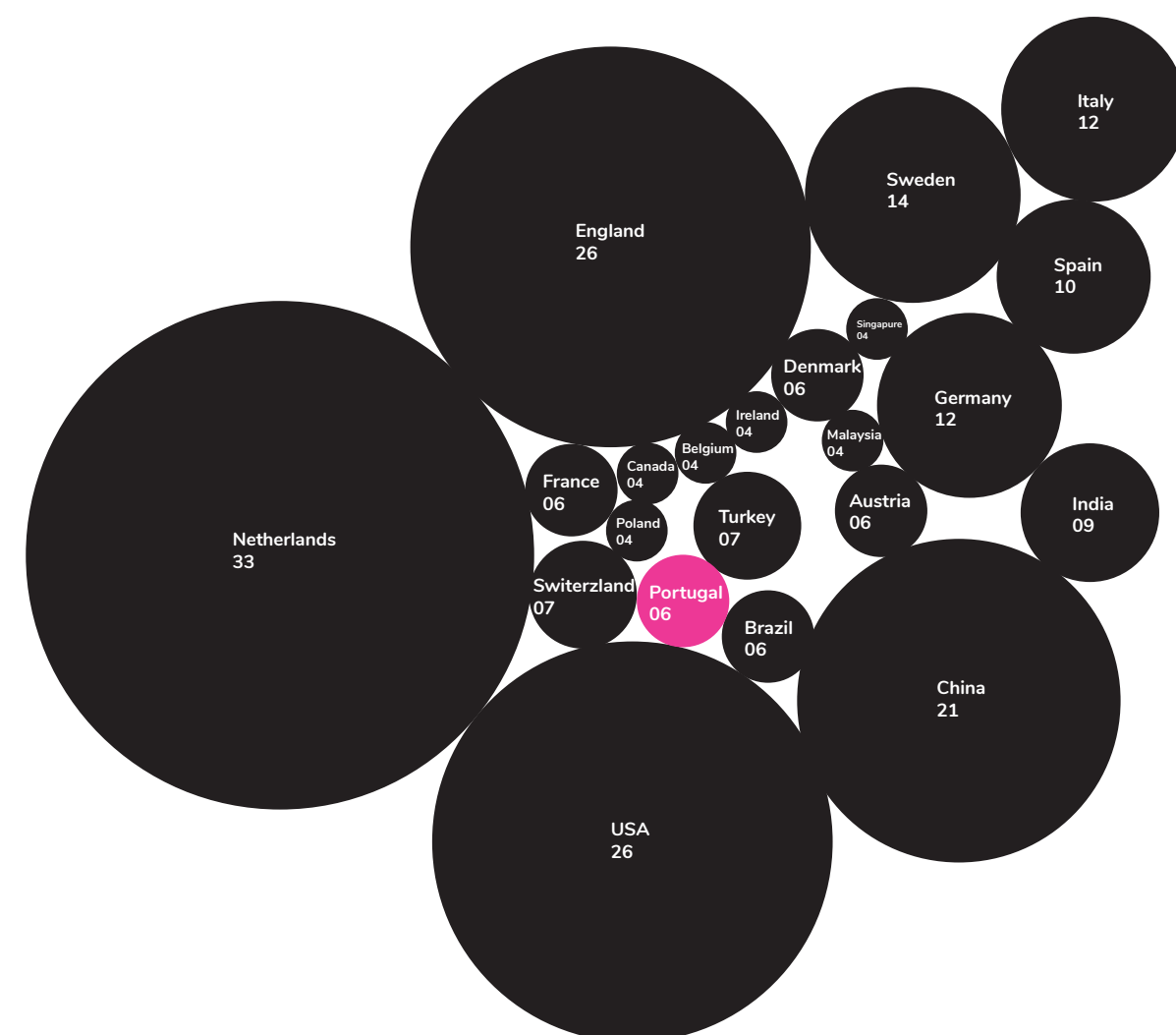


Figure 6  
 Comparison Between number of papers by topic per country using Web of Science Data  
 magenta : portugal

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