



INCREASING INTERNATIONAL STI COOPERATION BETWEEN **BRAZIL** AND THE **EUROPEAN UNION**

Co-publication Analysis BR-EU+ 2003-2014



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Goal of this analysis:

- Examine S&T cooperation patterns between **Brazil** and the **EU28** (+ selected countries) in terms of co-publications involving both regions.
- Years to examine: 2003-2014
- Focus on four research themes:
 - Marine research, bio-economy, food security, and sustainable agriculture
 - Energy
 - Nanotechnology
 - ICT

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Methodological approach:

- Given:
 - 4 research themes
 - Several thematic foci (per theme)
 - List of European countries to use in the study
- Source for the co-publication analysis: Scopus
- In database queries, use keywords adapted to the above-mentioned foci

Foci of the four research themes:

- *Marine research, bio-economy, food security, and sustainable agriculture:*
 - e.g. Blue Growth strategy, Sustainable Atlantic ecosystem, Adaptation to climate change
- *Energy:*
 - e.g. Concentrated solar power, smart grids, environmental impacts of biofuels
- *Nanotechnology:*
 - e.g. nano EHS, manufactures nanomaterials
- *ICT:*
 - e.g. cloud computing, e-infrastructures, high performance computing applications

NB: a full list of sub-foci can be found in the annex

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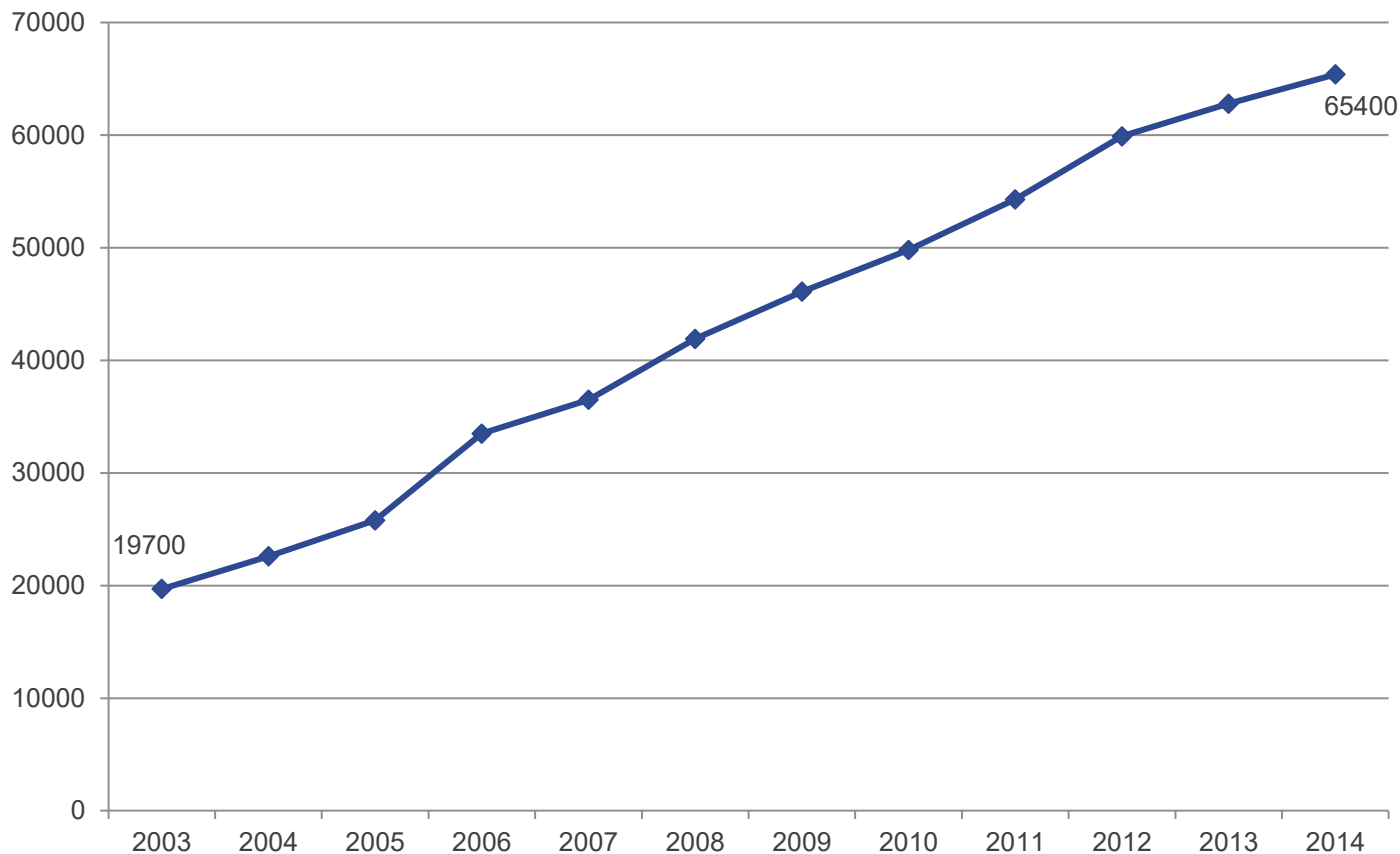
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BR overall publications (2004-2014)



BR more than tripled its publication output from 2003-2014
The total amount is about 520000 publications.

Subject area	publications
Medicine	149800
Agricultural and Biological Sciences	96400
Engineering	59300
Biochemistry, Genetics and Molecular Biology	58000
Physics and Astronomy	54400
Computer Science	40500
Chemistry	37100
Materials Science	33000
Mathematics	26900
Environmental Science	26500
Social Sciences	25400
Immunology and Microbiology	24300
Pharmacology, Toxicology and Pharmaceutics	19800
Earth and Planetary Sciences	19400
Veterinary	19100
Chemical Engineering	17900
Neuroscience	15900
Dentistry	14400
Energy	10800

Research areas w/ highest output in terms of BR publications

Top collaboration countries in terms of scholarly output with Brazil (2003-2014)

Country/region	co-publications
EU28+	72400
United States	48700
France	17100
United Kingdom	16700
Germany	14700
Spain	11900
Italy	10200
Canada	10000
Portugal	8500
Argentina	7400
Australia	6000
Netherlands	5700
Switzerland	4900
Japan	4500
Mexico	4400
China	4300
Russian Federation	3900
Colombia	3900
Belgium	3900
Chile	3900

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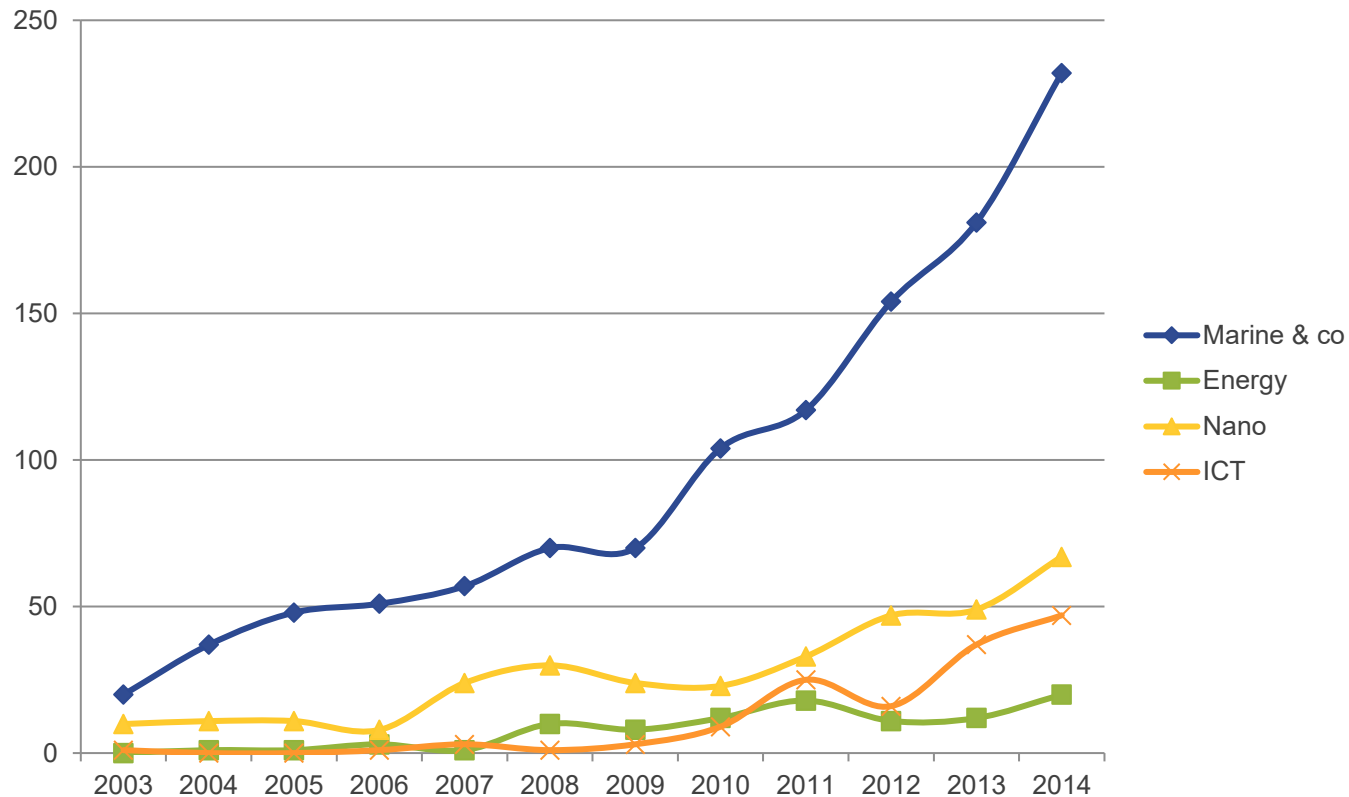
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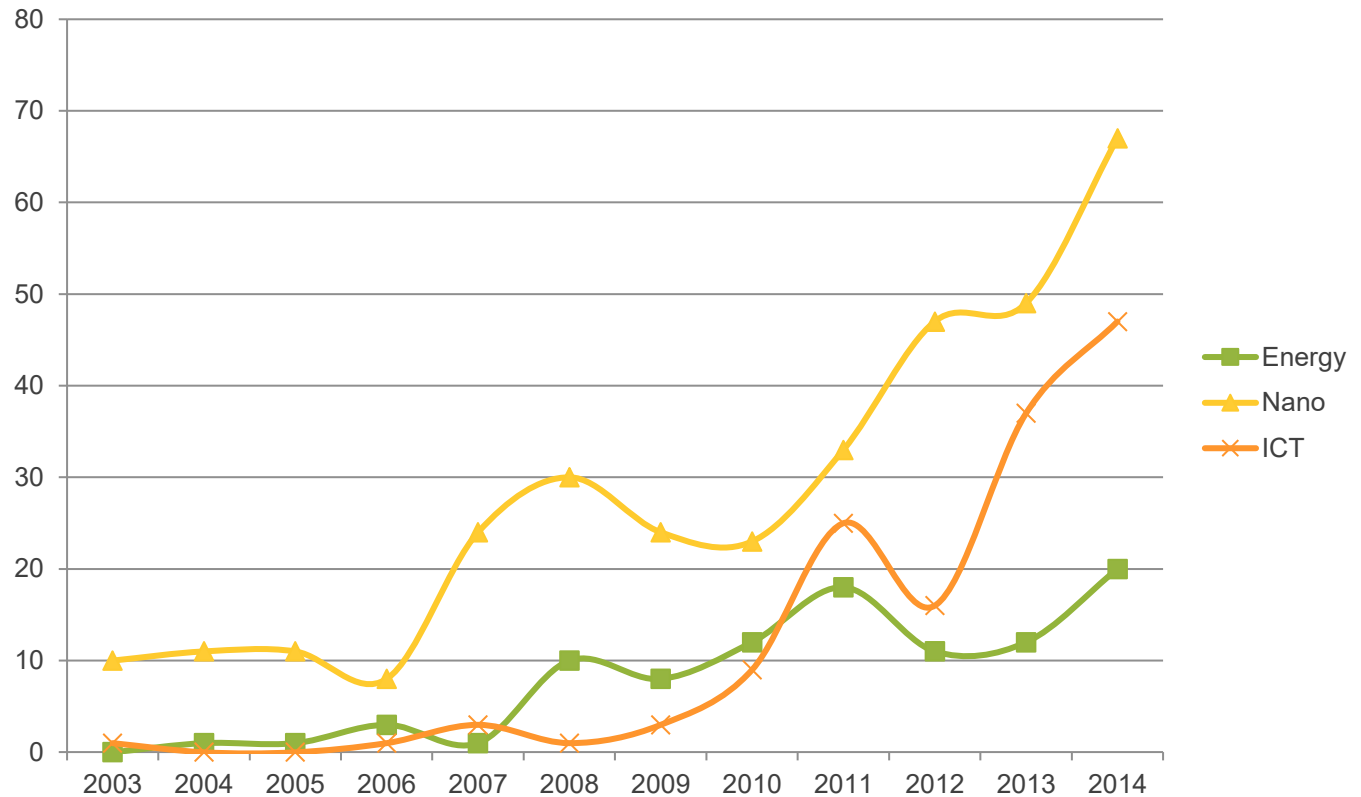
4 thematic areas

BR-EU+ co-publications in all four thematic areas (2003-2014)



4 thematic
areas

BR-EU+ co-publications in three of the four thematic areas (2003-2014)



NB: Marine research & co eliminated to make development of Energy, Nano, and ICT visible

**Marine
research,
bioeconomy,
food
security, and
sustainable
agriculture**

**Top collaboration
countries in terms of
scholarly output with
Brazil (2003-2014)**

Country	n
EU28+	1141
United Kingdom	400
United States	315
France	243
Germany	232
Spain	157
Netherlands	137
Australia	118
Portugal	104
Italy	97
Canada	93
Switzerland	86
Mexico	66
Denmark	59
Sweden	58
Belgium	52
China	52
India	49
South Africa	49

Thematic results

**Organisations that are most involved in BR-EU+
publications in this research field (2003-2014)**

n	organisation
211	Universidade de Sao Paulo - USP
85	Universidade Federal do Rio de Janeiro
73	Empresa Brasileira de Pesquisa Agropecuaria - Embrapa
68	Wageningen University and Research Centre
55	Instituto Nacional de Pesquisas Da Amazonia
52	UNESP-Universidade Estadual Paulista
52	Universidade Federal de Santa Catarina
50	University of East Anglia
50	Universidade Federal de Minas Gerais
45	University of Cambridge
44	Universidade de Brasilia
43	Lancaster University
43	University of Oxford
41	Universidade Estadual de Campinas
40	Universidade Federal do Parana
39	Museu Paraense Emilio Goeldi
37	Universidade Federal de Pernambuco
36	Universidade Federal do Rio Grande do Sul
36	Universidade Federal de Vicosa
36	Universidade Federal de Lavras
33	Universidade Federal de Goias

Energy

Top collaboration countries in terms of scholarly output with Brazil (2003-2014)

Country	n
EU28+	97
Germany	19
Portugal	19
Spain	18
Netherlands	17
United Kingdom	14
Sweden	13
Italy	12
United States	9
Denmark	7
France	6
Switzerland	4
Argentina	2
Belgium	2
Chile	2
Cuba	2
India	2

Organisations that are most involved in BR-EU+ publications in this research field (2003-2014)

n	organisation
19	Universidade de Sao Paulo - USP
17	Universidade Estadual de Campinas
11	Universidade Federal do Rio de Janeiro
10	Universidade Federal de Itajuba
6	The Royal Institute of Technology KTH
6	Technische Universiteit Eindhoven
5	Universidade Federal de Juiz de Fora
5	UNESP-Universidade Estadual Paulista
5	Instituto de Engenharia de Sistemas e Computadores Porto
5	Universidade Federal de Pernambuco
4	Universita degli Studi di Padova
4	Wageningen University and Research Centre
4	Empresa Brasileira de Pesquisa Agropecuaria - Embrapa
4	Danmarks Tekniske Universitet
4	Universidade Federal de Santa Catarina
4	Universidade Federal do Ceara
4	Universidade do Minho
4	University of Edinburgh

Nano-
technology

Top collaboration
countries in terms of
scholarly output with
Brazil (2003-2014)

Country	n
EU28+	337
France	82
Germany	67
Portugal	60
Spain	54
United States	53
United Kingdom	45
Italy	31
Australia	14
Belgium	13
Russia	12
Sweden	12
Denmark	10
India	9
Argentina	8
Ireland	8
Mexico	8
Switzerland	8

Organisations that are most involved in BR-EU+
publications in this research field (2003-2014)

n	organisation
74	Universidade de Sao Paulo - USP
37	Universidade Estadual de Campinas
27	UNESP-Universidade Estadual Paulista
27	Universidade Federal do Rio Grande do Sul
25	Universidade Federal do Rio de Janeiro
19	Universidade Federal de Minas Gerais
16	Universidade Federal de Santa Catarina
12	Universidade Federal do Rio Grande do Norte
12	Universidade de Aveiro
10	Universidade do Porto
10	Centro de Investigacao em Materiais Ceramicos e Compositos
10	Pontificia Universidade Catolica do Rio Grande do Sul
10	Universidade Federal do Ceara
10	Universite Grenoble Alpes
9	CNRS Centre National de la Recherche Scientifique
8	Instituto Superior Tecnico
8	Universidade Federal de Sao Carlos
8	Universidade Federal de Sao Paulo
8	Universidade Federal do Parana
8	Instituto Nacional de Metrologia

ICT

Top collaboration
countries in terms of
scholarly output with
Brazil (2003-2014)

Country	n
EU28+	143
France	32
Belgium	21
Germany	21
Portugal	20
United Kingdom	20
Spain	18
Sweden	15
Italy	11
United States	8
Greece	7
Malaysia	6
Netherlands	5
Australia	4
Canada	4
China	4
Switzerland	4

Organisations that are most involved in BR-EU+
publications in this research field (2003-2014)

n	organisation
35	Universidade de Sao Paulo - USP
15	Universidade Federal de Pernambuco
12	KU Leuven
12	Interuniversity Micro-Electronics Center at Leuven
11	Universidade Federal de Goias
10	Centro Universitario da FEI
9	Universidade Federal de Campina Grande
9	Universidade de Aveiro
8	Universidade Federal do Rio de Janeiro
8	L.M. Ericsson
8	Universidade Federal do Rio Grande do Norte
7	Universidade Federal do Rio Grande do Sul
6	Universite Catholique de Louvain
6	Universidade Federal do Para
6	Ericsson Sweden
6	Universidade Federal do Ceara
5	Universite Paris Sorbonne - Paris IV
5	Istituto Nazionale Di Fisica Nucleare, Frascati

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Conclusions:

- S&T cooperation patterns between **Brazil** and the **EU28** (+ selected countries) in terms of co-publications involving both regions have been analysed (2003-2014)
- BR overall output has tripled from 2003 to 2014
- The EU is the strongest collaboration partner, both in terms of the overall BR output as well as the output in the selected 4 themes
- In about 20 % of BR publications in Marine research, bio-economy, food security, and sustainable agriculture, the EU28+ is involved, in about 15 % in Energy, 20 % in Nanotechnology 20 %, and in ICT about 24 %.

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**Questions,
Feedback,
Comments,
Experiences?**

Annexe Foci of Marine research, bio-economy, food security, and sustainable agriculture:

- Marine Research
- Blue Growth strategy
- Sustainable Atlantic ecosystem
- Adaptation to climate change
- Innovative use and conservation of Atlantic
- Biodiversity
- bio-economy
- Nutritional aspects of food products
- Seabed critical raw materials
- Agro-economic areas
- Ocean literacy
- Ecological intensification
- sustainable aquaculture
- Sustainable development of aquaculture
- Low carbon agriculture
- Production of safe seafood products
- safe seafood
- Traceability
- Certification and standards to improve quality and trade conditions
- food security
- sustainable agriculture
- Improvement of agricultural production systems

Annexe

Foci of *Energy*:

- Biofuels
- Biofuel technologies
- Concentrated solar power
- Transport decarbonisation
- Wind power
- Environmental impacts of biofuels
- Smart grids
- New biofuels using sustainable feedstock need to reach the market

Annexe

Foci of *Nanotechnology*:

- Nanosafety
- Manufactured nanomaterials
- Nano EHS (environmental, health and safety) – Regulatory research activities

Foci of *ICT*:

- Cloud computing
- E-infrastructures
- Future Internet
- Cloud-centric applications for big data
- Microelectronics
- High Performance Computing applications
- Microsystems Experimental Platforms