



# **BRIEF EVALUATION OF THE CZECH PARTICIPATION IN THE INSTITUTIONAL PARTNERSHIPS OF THE PROGRAMME H2020**

**19<sup>th</sup> CZECH DAYS FOR EUROPEAN RESEARCH CZEDER 2021**  
Daniel Frank, [frank@tc.cz](mailto:frank@tc.cz)

# INNOVATION STRATEGY OF THE CR 2019 – 2030

*„According to the SII, the Czech Republic is in the most numerous group of Moderate Innovators. The plan? We want to be among the Strong Innovators by 2025, and by 2030 in the leading European group, Innovation Leaders. Our fourteenth place in the EU in the GII and 13<sup>th</sup> place according to the IOI criteria now put us at the exact average of the European twenty-eight. **By 2025, we want to be in the top ten and by 2030 in the top seven EU countries, within both the GII and the IOI.**“*

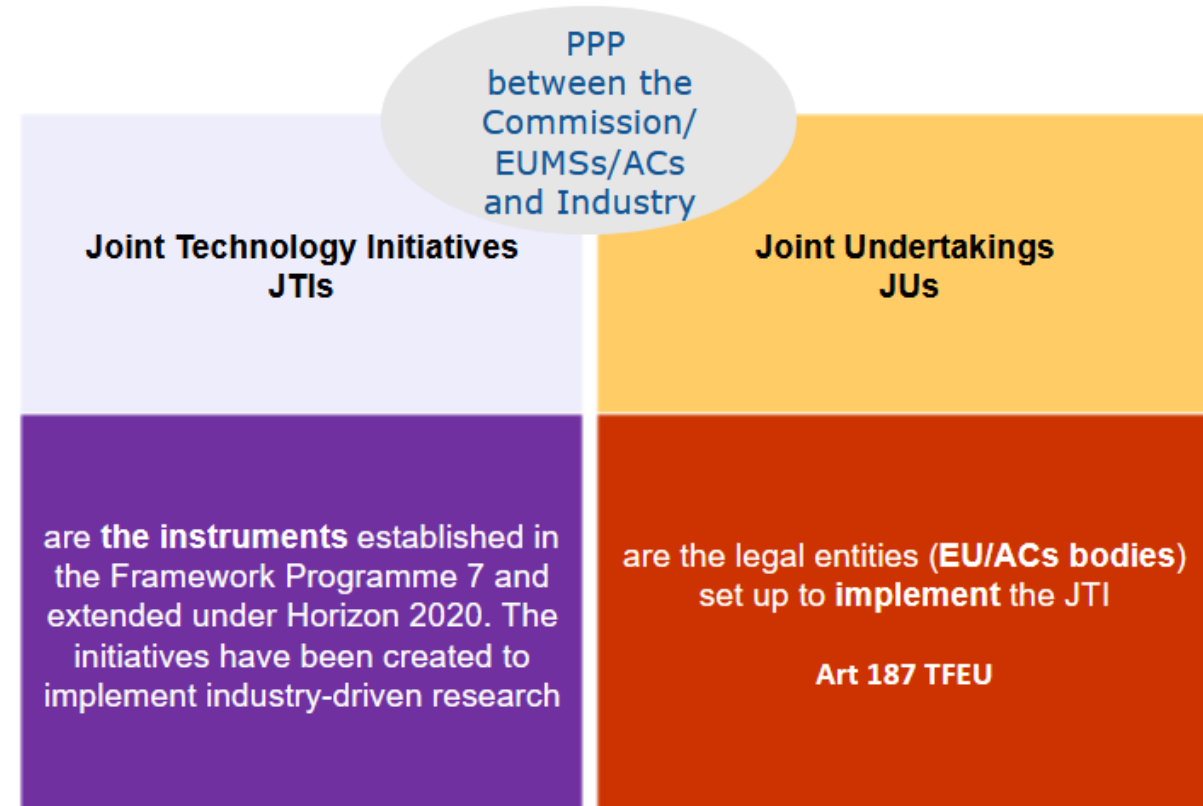
Karel Havlíček, Council for Research, Development and Innovation

<https://www.vyzkum.cz/FrontClanek.aspx?idsekce=867922>



# JTIs - JOINT TECHNOLOGY INITIATIVES, JUs – JOINT UNDERTAKINGS

- The Joint Technological Initiatives (JTI) are **public-private partnerships (PPP)** created by the European Commission within Article 187 of the Treaty of the Functioning of the European Union.
- **JTIs** aim to increase the competitiveness of industry and to foster cooperation with the private sector and Member States in strategic areas of EU research and innovation, to achieve results that one country or company is less likely to achieve alone and to bring research and innovation results closer to the market.
- **JUs** were established to implement the objectives of the JTIs
- **JUs** consist of public members, typically the European Union (represented by the Commission), private members, which are from industry and research, and in some cases participating Member States and international organizations. JUs adopt their own research agendas and work plans and award funding mainly through open calls for proposals.



<https://ec.europa.eu/programmes/horizon2020/en/partnerships-industry>

# JTI - JOINT TECHNOLOGY INITIATIVES

The Joint Technology Initiatives (JTIs) in H2020 programme:

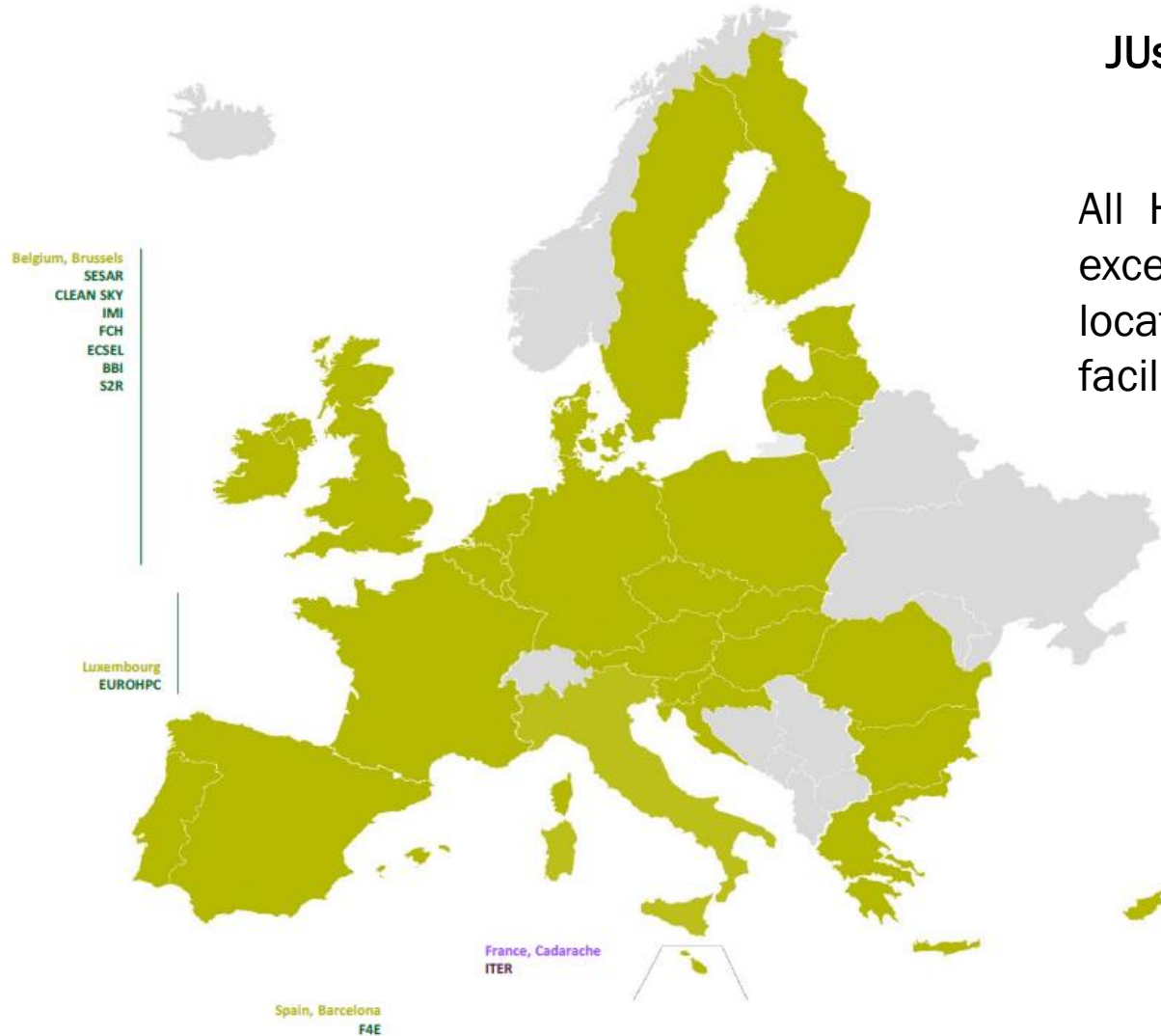
- **Clean Sky 2 (CS2):** to develop cleaner, quieter aircraft with significantly less CO2 emissions
- **Shift2Rail (S2R):** to develop better trains and railway infrastructure
- **SESAR:** to develop the new generation European air traffic management system
- **Fuel Cells and Hydrogen 2 (FCH):** to develop and demonstrate clean and efficient fuel cell and hydrogen technologies for stationary and mobile applications
- **Innovative Medicine 2 (IMI):** to develop next generation vaccines, medicines and treatments, such as new antibiotics
- **Biobased Industries (BBI):** to use renewable natural resources and innovative technologies for greener everyday products
- **Electronic Components and Systems for European Leadership (ECSEL):** to boost Europe's electronics manufacturing capabilities. ECSEL combines the Joint Technology Initiatives (JTI) ARTEMIS - Embedded Systems, ENIAC - Nanoelectronics and EPoSS
- **EuroHPC – European High Performance Computing:** established 2018 to support the implementation of several supercomputers in Europe, and to foster the development of High Performance Computing technologies.



# JUs IN THE EUROPEAN UNION

JUs are located in the European Union

All H2020 JUs are based in Brussels (Belgium), with the exception of EuroHPC, which is located in Luxembourg. F4E is located in Barcelona (Spain), whereas the main fusion facilities are being built in Cadarache, France



Source: ECA.

## ***F4E is operating under Euratom to establish ITER***

*In 2007, under the Euratom Treaty, the EU established the 'Fusion for Energy' (F4E) JU for a period of 35 years. It is responsible for providing Europe's contribution to the International Thermonuclear Experimental Reactor (ITER), a global scientific partnership that aims to demonstrate that nuclear fusion can provide a viable and sustainable source of energy<sup>1</sup>. The founding members of F4E are Euratom, represented by the Commission, the Euratom Member States, and Switzerland.*



# JUs' H2020 RESEARCH ACTIVITIES ARE FINANCED BY BOTH THE EU AND THE INDUSTRY AND RESEARCH PARTNERS

For the JUs implementing H2020 projects, both the EU and industry and research partners contribute to funding the JUs' research and innovation activities:

- The EU (represented by the Commission) provides cash funds from the H2020 programme to co-fund the JUs' research and innovation projects.
- The private partners from industry and research provide in-kind contributions by delivering the research and innovation activities in which they invested their own financial resources, human resources, assets and technologies.
- Both the EU and private partners equally finance the JUs' administrative costs

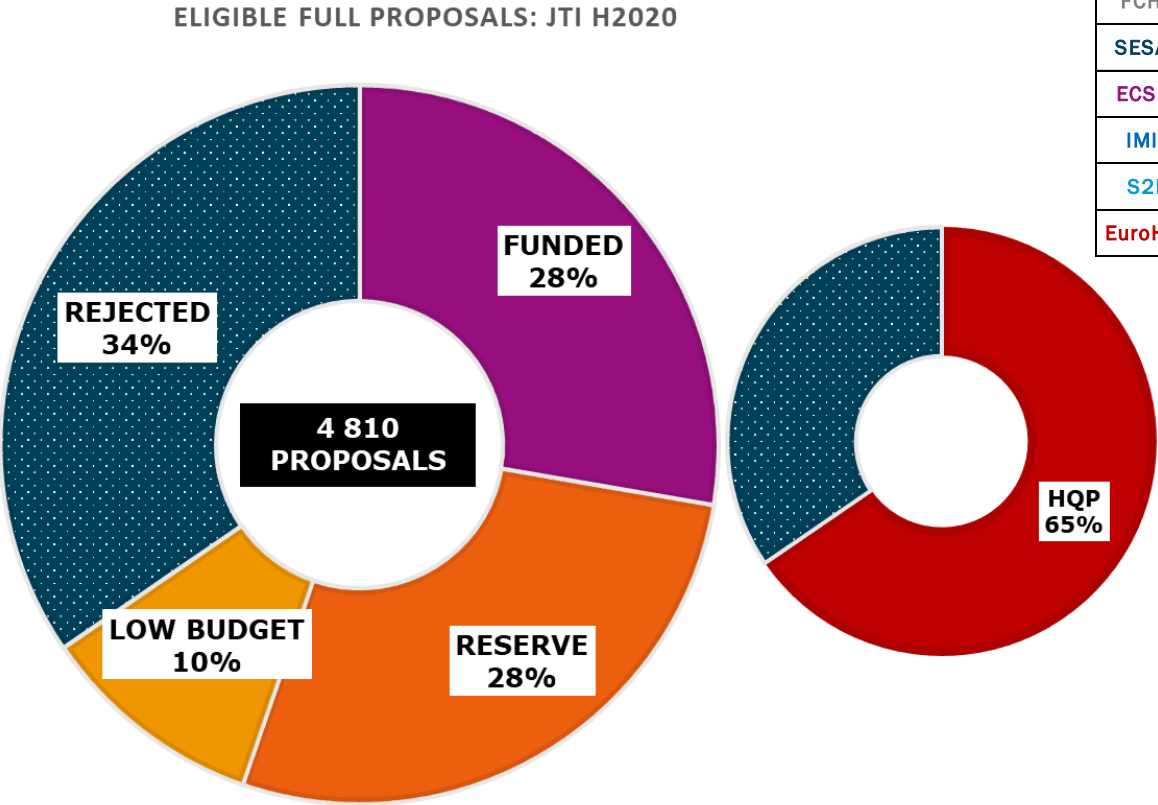
# JTI - JUs BUDGET 2014 - 2020

JTI JUs BUDGET (million € for 2014 - 2020)				
JUs under H2020	EU (H2020, CEF) - max.	Private Partners - min.	other	Total
ECSEL	1 185	1 657	1 170	4 012
FCH2	665	380		1 045
BBI	975	2730		3 705
CS2	1 755	2 194		3 949
IMI2	1 638	1 425	213	3 276
SESAR	585	500	500	1 585
S2R	450	470		920
EuroHPC	486	422	576	1 484

\*SESAR also received funding from the Connecting Europe Facility (CEF) under the current MFF 2014-2020

Source: EC calculation based on the Council Regulations establishing the JUs

# JOINT TECHNOLOGY INITIATIVES (JTIs) OF THE H2020 PROGRAMME: EVALUATION OF PROPOSALS



JTI	ELIGIBLE FULL PROPOSALS (%)						ELIGIBLE FULL PROPOSALS
	FUNDED	RESERVE	LOW BUDGET	REJECTED	TOTAL	HQP	
CS2	25	40	4	31	100	69	2 203
BBI	16	24	10	50	100	50	910
FCH2	31	21		48	100	52	435
SESAR	35	2	38	25	100	75	422
ECSEL	33	4	48	15	100	85	291
IMI2	48	2	2	48	100	52	258
S2R	41	35		24	100	76	244
EuroHPC	57	26		17	100	83	47

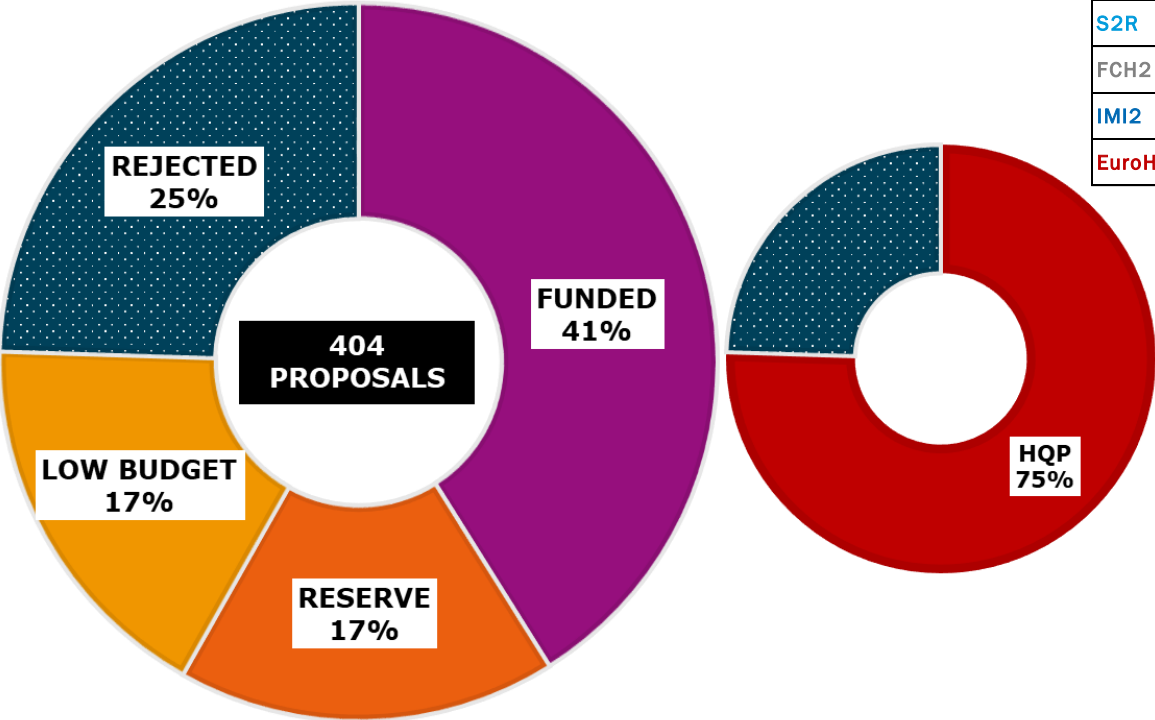
Source: e-Corda H2020 proposals and applicants 09/2021, own data processing





# JOINT TECHNOLOGY INITIATIVES (JTIs) OF THE H2020 PROGRAMME: EVALUATION OF PROPOSALS (CZ)

ELIGIBLE FULL PROPOSALS: JTI H2020 WITH CZ



JTI	ELIGIBLE FULL PROPOSALS (%)						ELIGIBLE FULL PROPOSALS
	FUNDED	RESERVE	LOW BUDGET	REJECTED	TOTAL	HQP	
ECSEL	37	1	50	12	100	88	102
CS2	46	30	4	20	100	80	74
BBI	10	25	9	56	100	44	67
SESAR	68	5	17	10	100	90	60
S2R	49	36		15	100	85	47
FCH2	26	15		59	100	41	27
IMI2	71			29	100	71	14
EuroHPC	46	38		16	100	84	13

The high success rates in JTI-related calls can be explained by the focused industry related calls, highly relevant to the particular sector with fewer potential applicants.

Source: e-Corda H2020 proposals and applicants 09/2021, own data processing



# HORIZON 2020 –JU CO-FUNDING (IN MILLION EUROS)

EU contributions (as per Founding Regulations)			
EU total	JU administration	max JU co-funding	JUs under Horizon 2020
585,0	29,3	555,8	SESAR 2020
1 755,0	39,0	1 716,0	CS2
1 638,0	42,6	1 595,4	IMI2
665,0	19,0	646,0	FCH2
1 185,0	15,3	1 169,7	ECSEL
975,0	29,3	945,8	BBI
398,0	13,5	384,5	S2R
<b>7 201,0</b>	<b>187,9</b>	<b>7 013,1</b>	<b>Total</b>

Source: Data provided by the JUs.

Source: [2019 Audit of EU Joint Undertakings in brief](#)

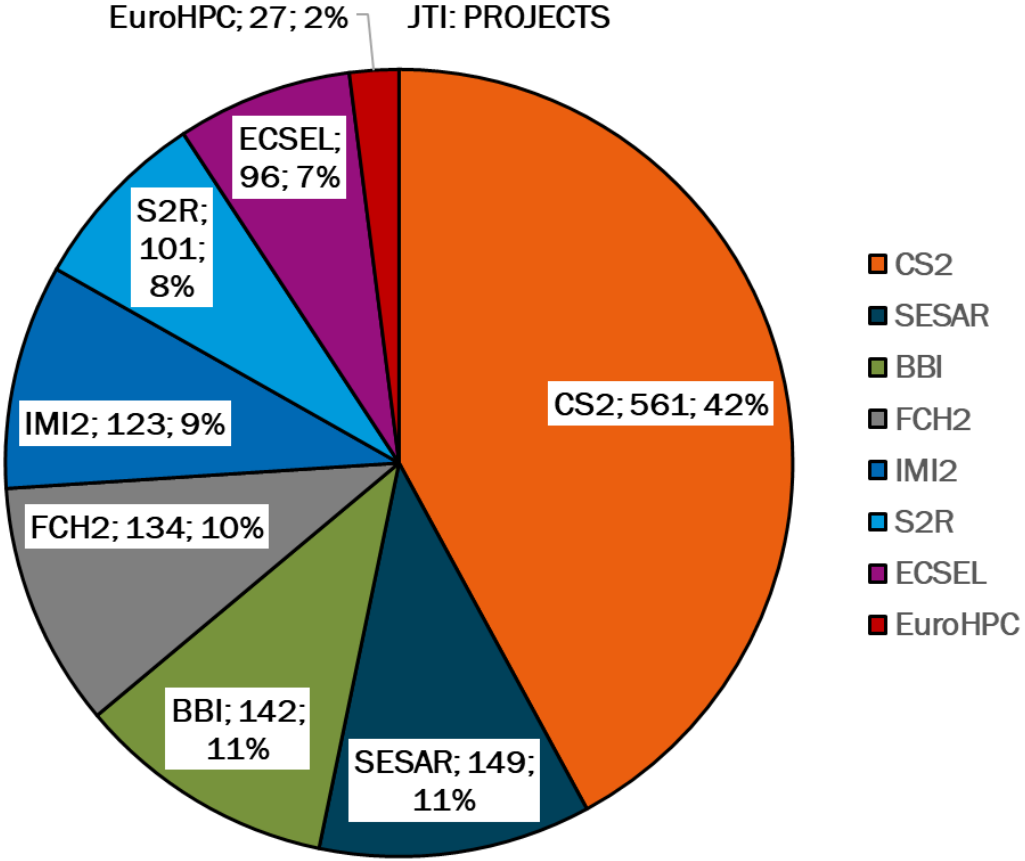
JTI	H2020 contrib. (mil.€)	H2020 co-funding (mil.€) without administration	Programme implementation rate (%)
SESAR	545,6	555,8	98,2
CS2	1 622,9	1 716,0	94,6
IMI2	1 464,2	1 595,4	91,8
FCH2	639,4	646,0	99,0
ECSEL	1 162,2	1 169,7	99,4
BBI	821,5	945,8	86,9
S2R	372,9	384,5	97,0
EuroHPC	141,4	180,0	78,6
TOTAL	6 770,1	7 193,2	94,1

For the current MFF 2014-2020, JUs manage aprox. 10 % of the global H2020 budget.

Source: e-Corda H2020 grant agreements and participants 09/2021, own data processing



# INSTITUTIONAL JOINT TECHNOLOGY INITIATIVES (JTIs) OF THE H2020 PROGRAMME - PROJECTS



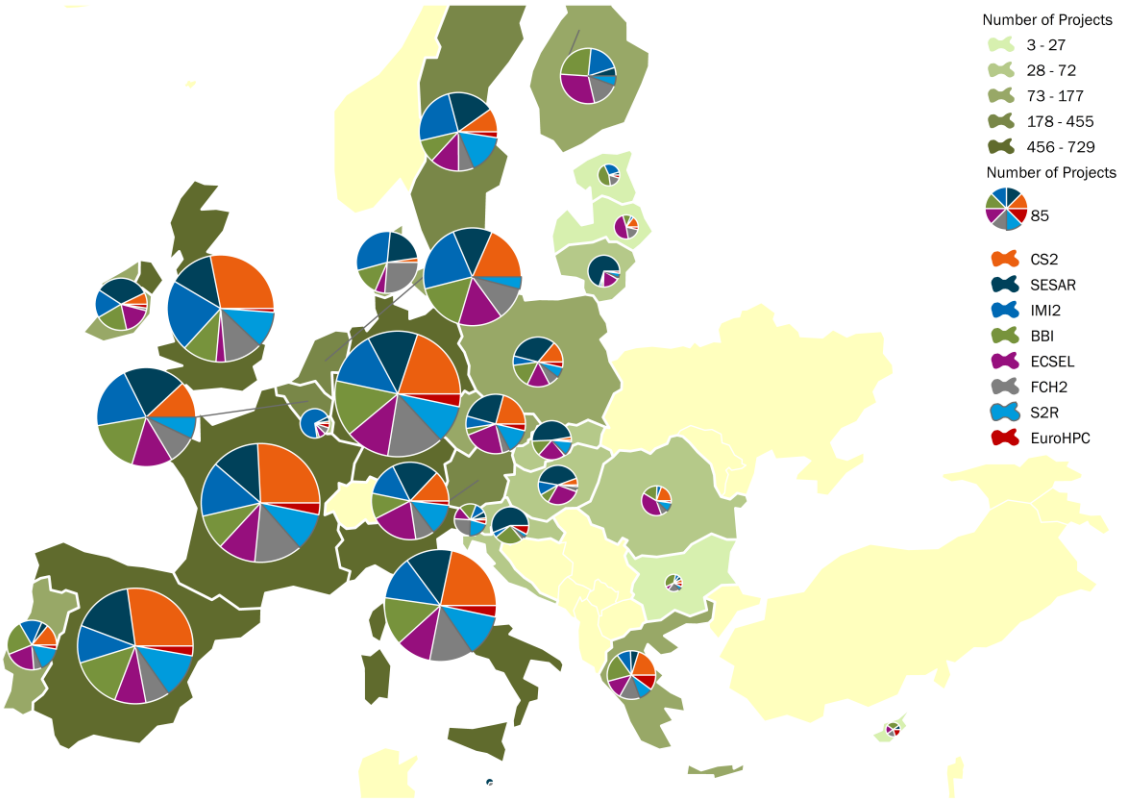
JTI	JTI projects	JTI projects CZ	CZ share (%)
ECSEL	96	37	38,5
SESAR	149	41	27,5
EuroHPC	27	6	22,2
S2R	101	22	21,8
IMI2	123	11	8,9
CS2	561	34	6,1
FCH2	134	7	5,2
BBI	142	6	4,2
TOTAL	1 333	164	12,3

Source: e-Corda H2020 grant agreements and participants 09/2021, own data processing



# PARTICIPATION OF EU COUNTRIES IN INSTITUTIONAL JOINT TECHNOLOGY INITIATIVES (JTIs) OF THE H2020 PROGRAMME

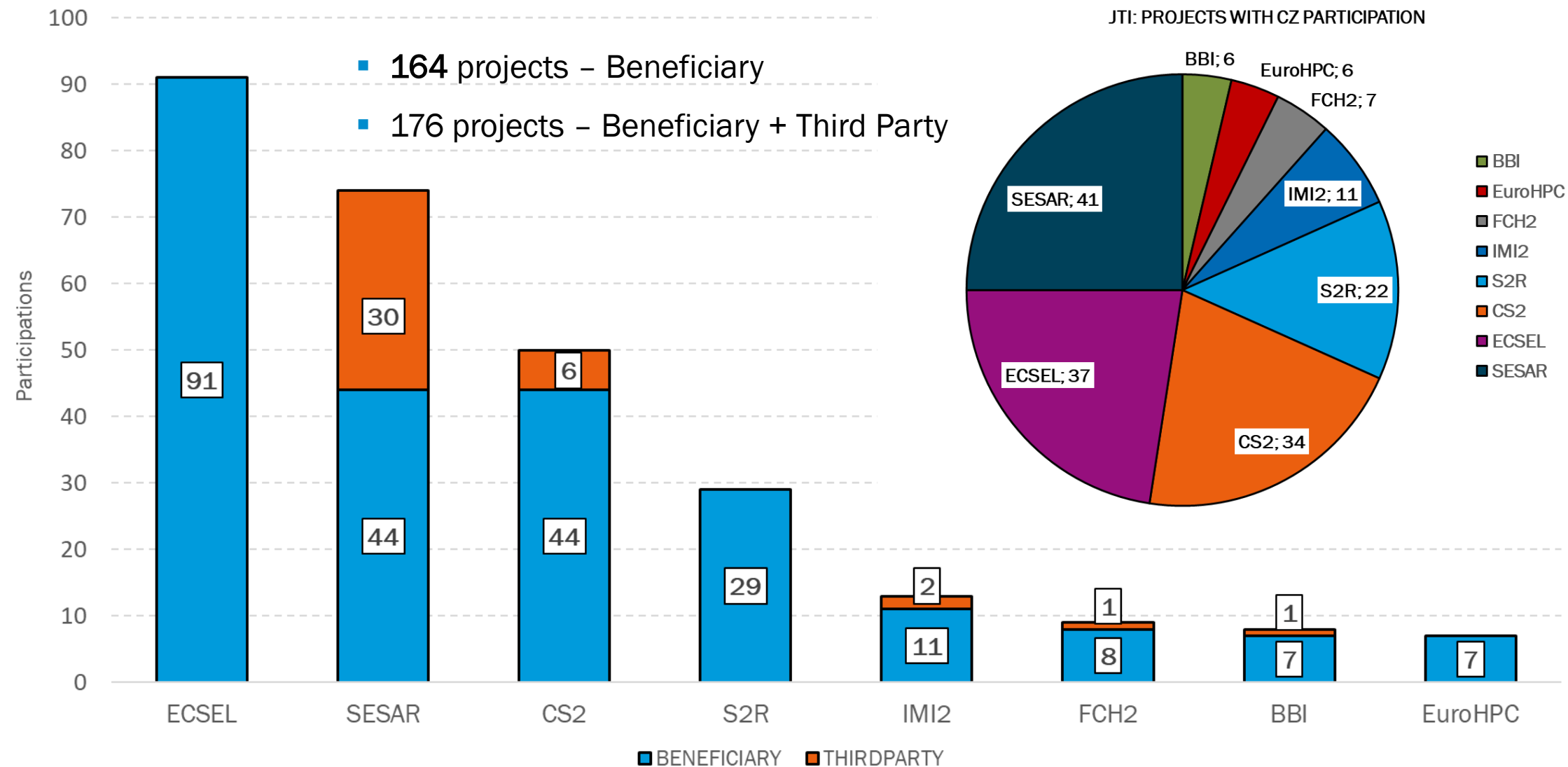
country	CS2	SESAR	IMI2	BBI	ECSEL	FCH2	S2R	EuroHPC	total
DE	145	94	101	105	83	106	71	24	729
FR	168	84	97	62	67	85	67	21	651
ES	168	105	65	89	54	42	77	17	617
IT	126	78	73	81	59	73	71	19	580
UK	149	71	115	55	15	61	58	6	530
BE	54	92	92	79	60	42	32	4	455
NL	81	57	99	72	64	48	18	3	442
SE	28	55	70	27	34	18	46	7	285
AT	36	54	40	30	55	22	36	5	278
DK	4	37	54	25	9	46	1	1	177
CZ	34	41	11	6	37	7	22	6	164
FI		7	26	36	42	22	8	1	142
IE	9	42	22	25	22	2	1	3	126
PL	16	37	7	18	17	8	8	4	115
PT	16	5	17	26	23	6	18	3	114
EL	22	6	10	21	14	15	10	11	109
HU	4	30	8	6	20	2	1	1	72
SK	2	34		9	16	1	8	1	71
HR		36	3	16		2	2	5	64
LT		33	1	1	8	1	2	1	47
SI	1	3	5	8	6	12	10	2	47
RO	8		2	7	16	3	4	1	41
LU	1	2	28	1	3	3		2	40
LV	4		1	3	13	5		1	27
EE		1	6	10		4		1	22
BG	1	1	1	5	1	3	1	1	14
CY		1		3	2	2		2	10
MT		2				1			3



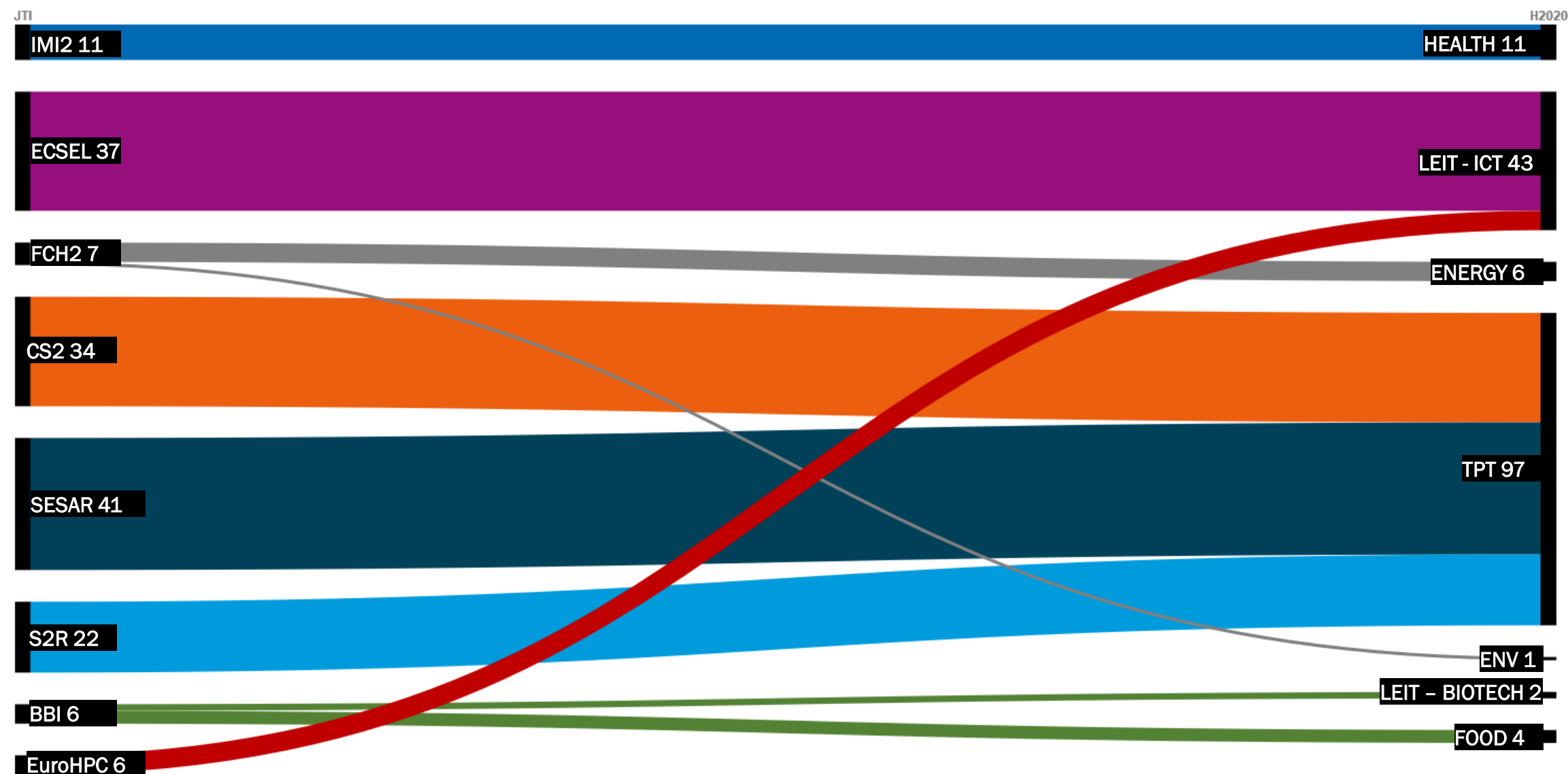
Source: e-Corda H2020 grant agreements and participants 09/2021, own data processing



# JTI H2020 – CZECH PARTICIPATION



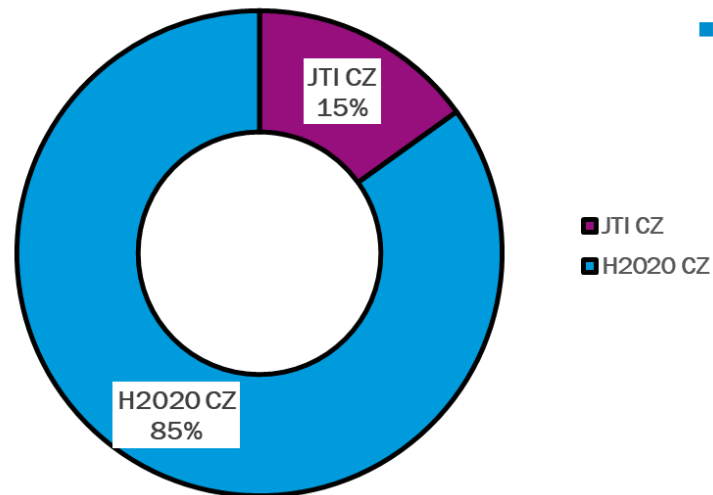
# JTI H2020 – CZECH PARTICIPATION



# JTI H2020 – CZECH PARTICIPATION

JTI	TOT COSTS (€)	EC NET CONTRIB (€)	EC CONTRIB BEN (€)
ECSEL	39 836 324,83	12 532 842,17	12 532 842,17
CS2	39 014 109,70	28 316 822,02	28 840 338,02
SESAR	30 540 234,40	18 690 861,73	7 320 764,02
S2R	5 221 157,17	6 789 310,42	6 789 310,42
EuroHPC	4 516 875,00	2 258 437,50	2 258 437,50
IMI2	3 896 547,50	3 056 790,00	3 014 370,00
BBI	3 343 557,39	2 563 058,43	2 164 710,43
FCH2	1 456 156,25	1 456 156,25	1 440 206,25
<b>TOTAL</b>	<b>127 824 962,24</b>	<b>75 664 278,52</b>	<b>64 360 978,81</b>

CZECHIA - H2020 EC NET CONTRIB (%)

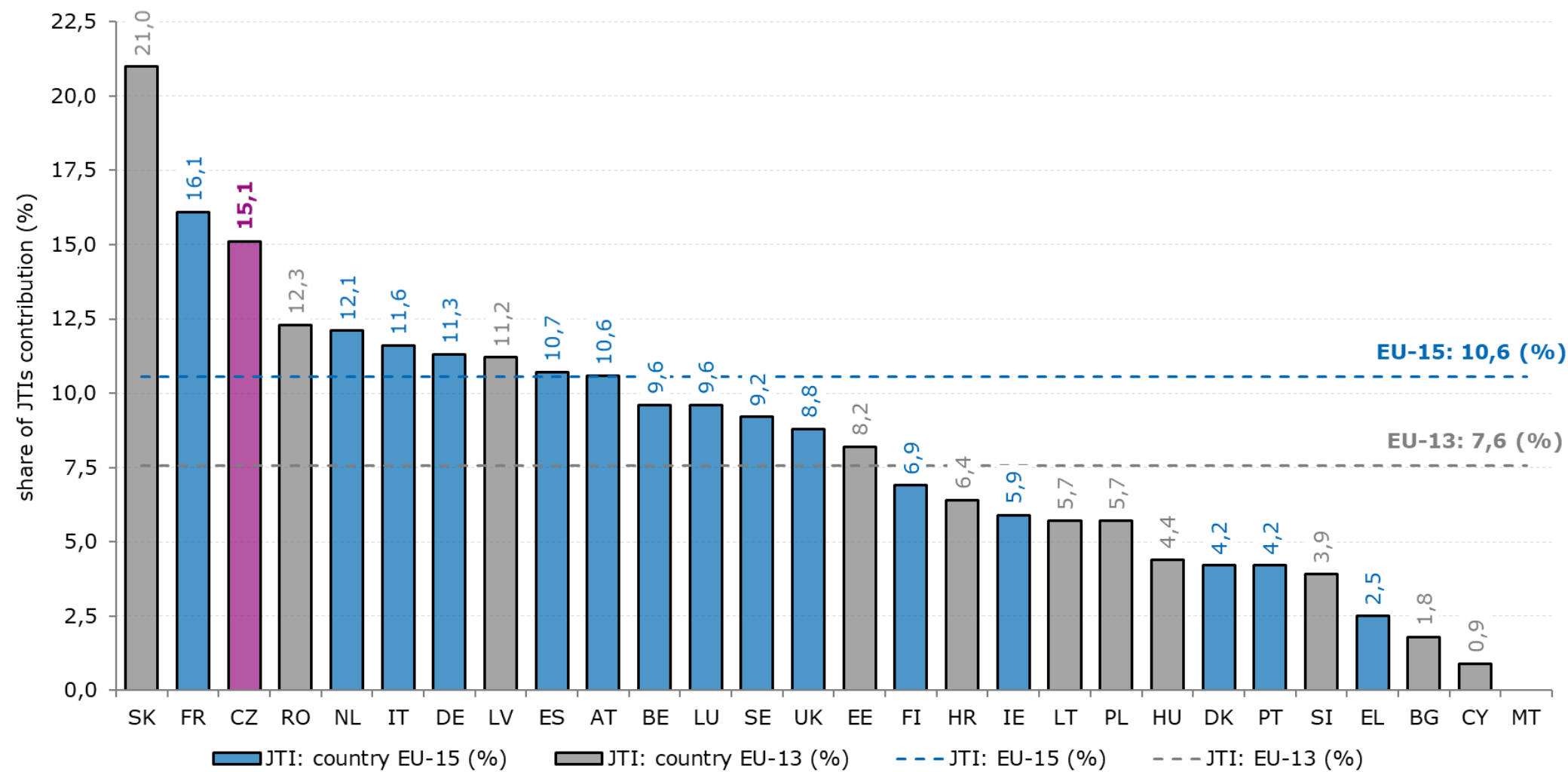


- CZ H2020 (2014 – 2020) – 501,5 € mil. – aprox. 1/3 CZECH Government budget allocations for R&D (GBARD) in 2020

Source: e-Corda H2020 grant agreements and participants 09/2021, own data processing



# PROPORTION OF FINANCIAL CONTRIBUTION FROM H2020 BUDGET FOR JTIs: EU



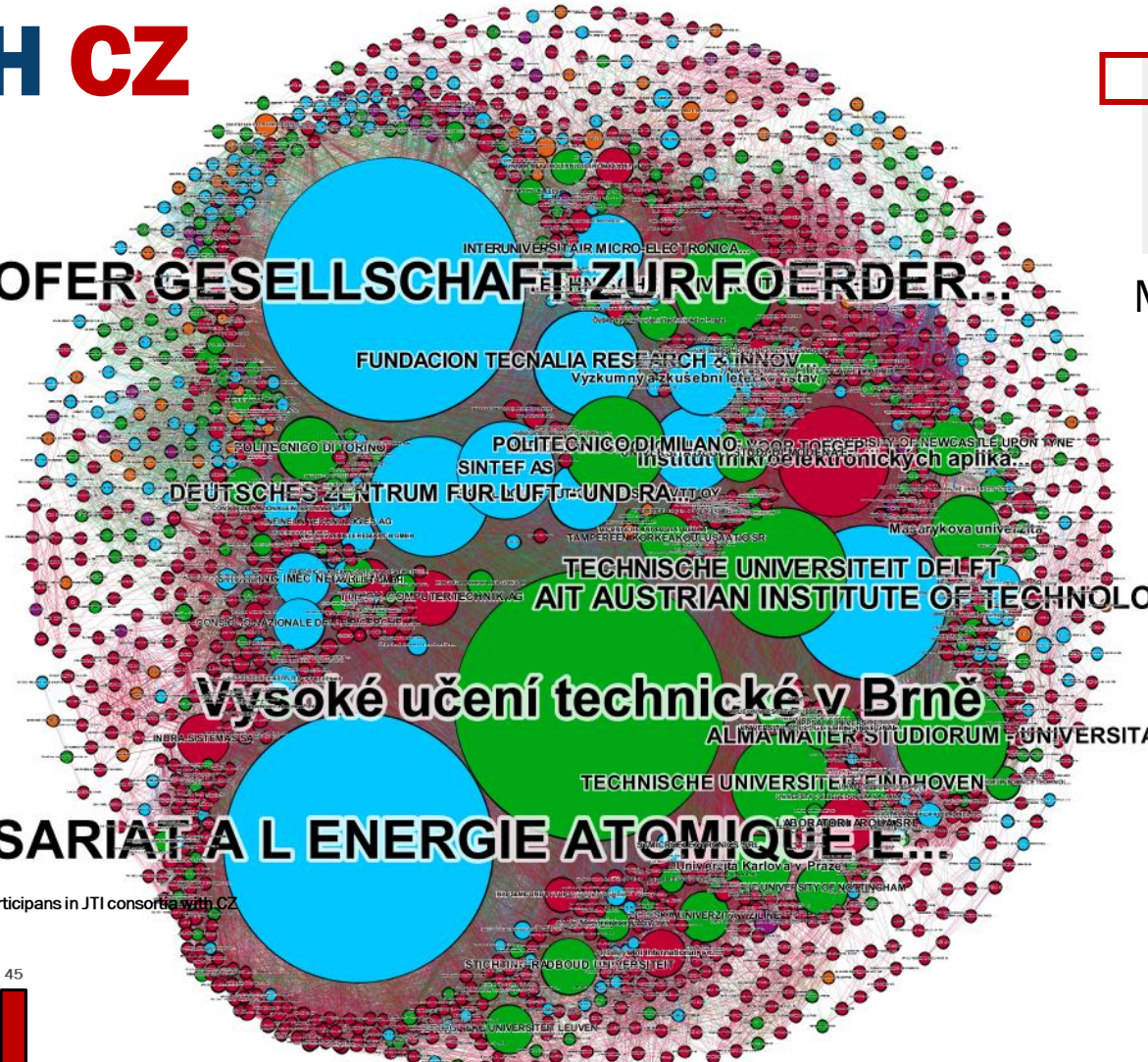
Source: e-Corda H2020 grant agreements and participants 09/2021, own data processing





# JTI H2020 – COLLABORATION NETWORK: PROJECTS WITH CZ

FRAUNHOFER GESELLSCHAFT ZUR FOERDER...



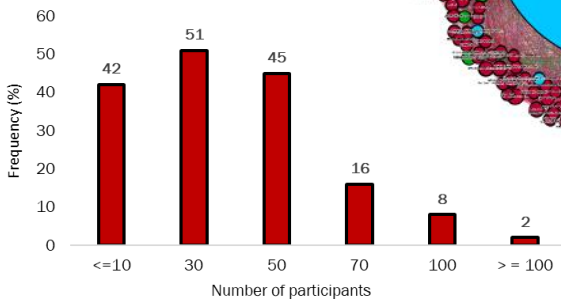
PRC	(66,54%)
HES	(15,43%)
REC	(12,46%)
OTH	(3,42%)
PUB	(2,15%)

Main Brokers

Id	Label	Betweenness Centrality
999873091;	Vysoké učení technické v Brně	102531.199006
999992401;	COMMISSARIAT A L ENERGIE ATOMIQUE ET AUX ENERGIES ALT...	102053.399713
999984059;	FRAUNHOFER GESELLSCHAFT ZUR FOERDERUNG DER ANGEWA...	99768.540698
999584128;	AIT AUSTRIAN INSTITUTE OF TECHNOLOGY GMBH	56395.418445
999977366;	TECHNISCHE UNIVERSITEIT DELFT	46481.286813
999981731;	DEUTSCHES ZENTRUM FUR LUFT - UND RAUMFAHRT EV	42907.191133
999993953;	ALMA MATER STUDIORUM - UNIVERSITA DI BOLOGNA	39718.16568
999697424;	Institut mikroelektronických aplikací, s.r.o.	39130.629647
999604110;	FUNDACION TECNALIA RESEARCH & INNOVATION	37098.565545
999977269;	TECHNISCHE UNIVERSITEIT EINDHOVEN	35923.388714
999879881;	POLITECNICO DI MILANO	35397.678118
999897729;	TECHNISCHE UNIVERSITAET DRESDEN	34209.257135
910945140;	SINTEF AS	33971.549941
999988909;	NEDERLANDSE ORGANISATIE VOOR TOEGEPAST NATUURWETE...	28555.061551
999981149;	INTERUNIVERSITAIR MICRO-ELECTRONICA CENTRUM	24103.485095
999497992;	Výzkumný a zkušební letecký ústav, a.s.	23171.597497
999880657;	Masarykova univerzita	22779.165005

COMMISSARIAT A L ENERGIE ATOMIQUE E...

Frequency of num. of participants in JTI consortia with CZ

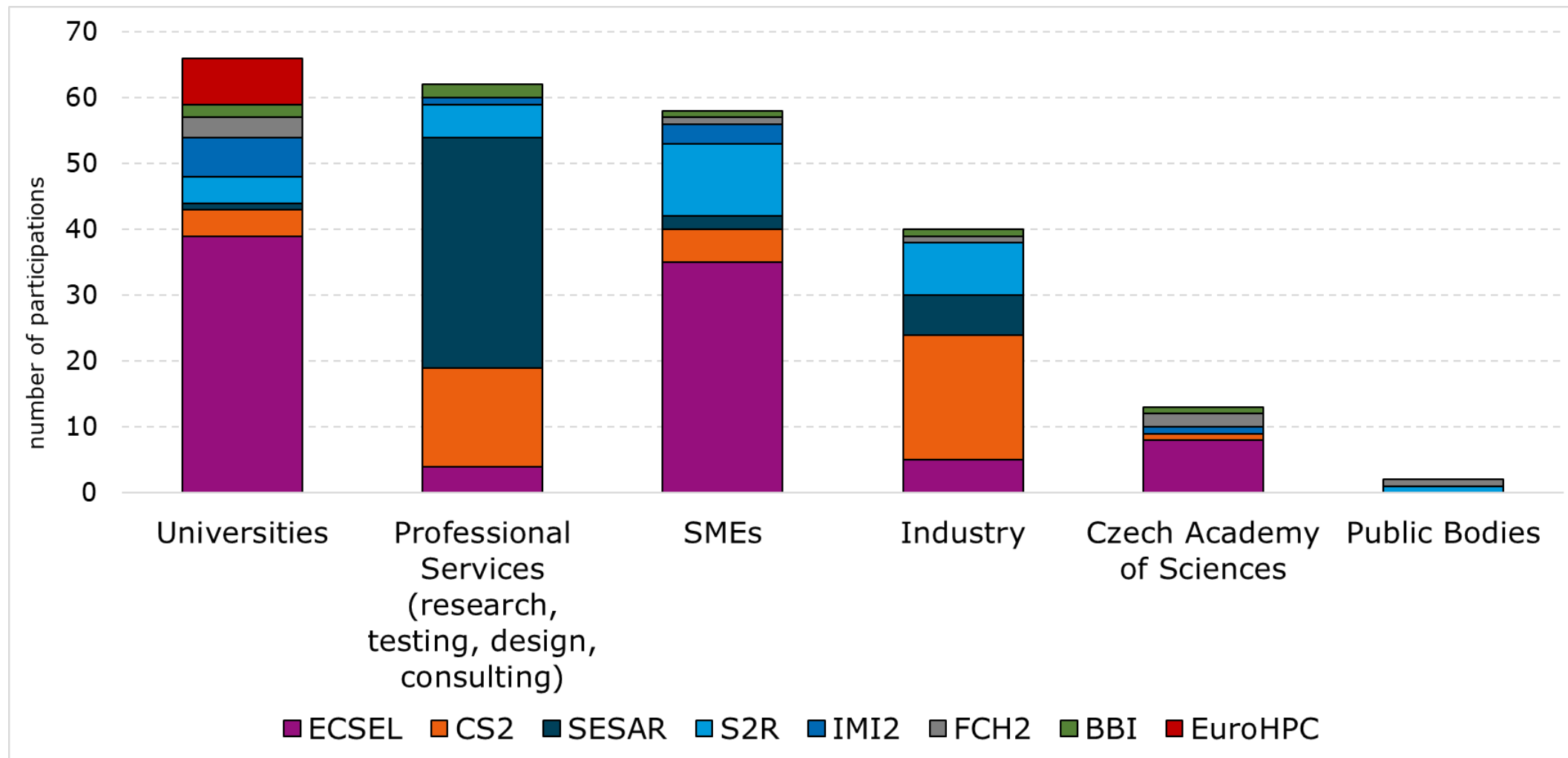


- 1 581 institutions in 164 JTI projects
- Num part: avg 29, median 26

Source: e-Corda H2020 grant agreements and participants 09/2021, own data processing



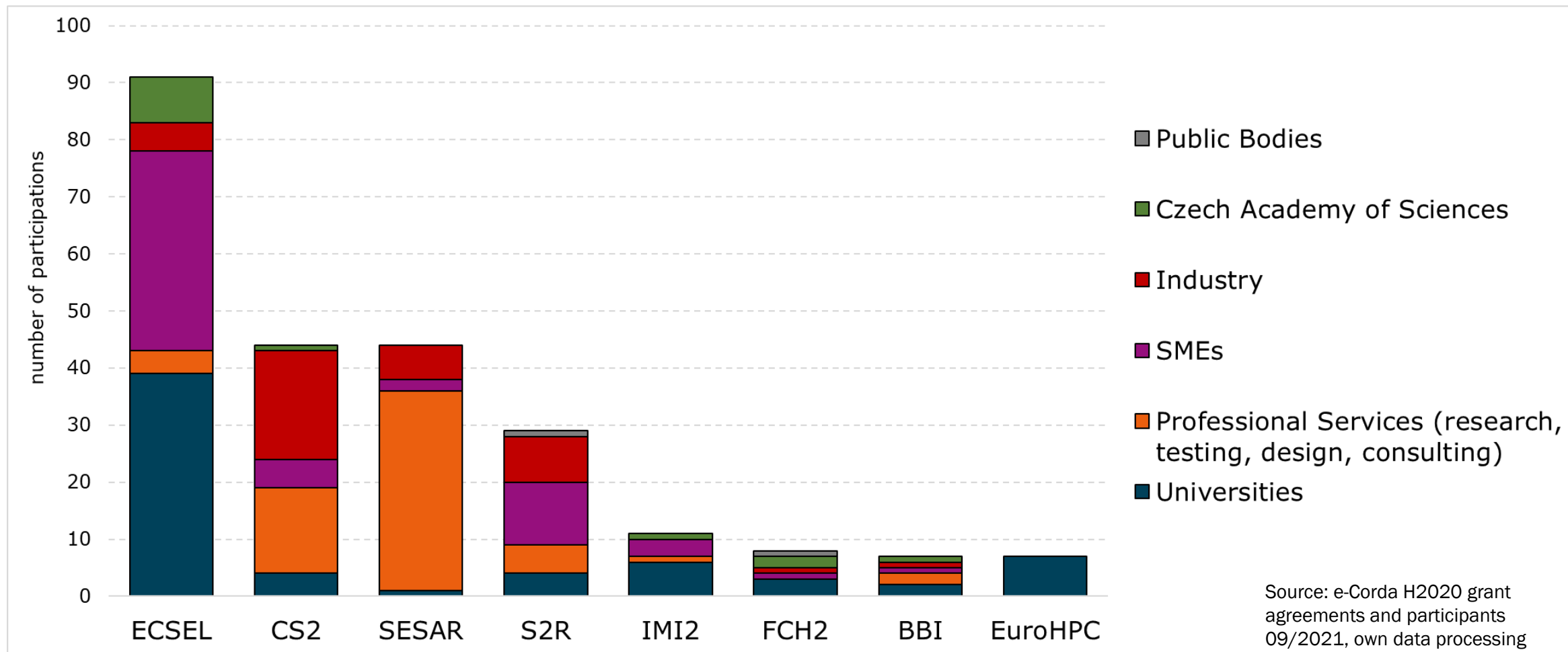
# NUMBER OF CZECH PARTICIPATIONS (BENEFICIARIES) IN THE JTIs SINCE 2014



Source: e-Corda H2020 grant agreements and participants 09/2021, own data processing



# NUMBER OF CZECH PARTICIPATIONS (BENEFICIARIES) IN THE JTIs SINCE 2014



**SMEs in ECSEL vs. SMEs in SESAR:** JTIs like SESAR, which support research in air traffic management in Europe, attract partners with a different profile, since air traffic management is not an area of interest to typical SMEs.

# JTI H2020 – CZECH SUCCESSFUL PARTICIPANTS

CZ participant - ECSEL	Type	Participations
Vysoké učení technické v Brně ( 15 CEITEC, 8 FTI)	HES	23
Institut mikroelektronických aplikací, s.r.o.	PRC	19
Ústav teorie informace a automatizace AV ČR, v.v.i.	REC	6
CAMEA, s r.o.	PRC	6
České vysoké učení technické v Praze (4 FEL, CIIRC 2)	HES	6
Západočeská univerzita v Plzni (6 FAV)	HES	6
Univerzita Karlova v Praze (2 MFF)	HES	2
CRYTUR, spol. s r.o.	PRC	2
Fyzikální ústav AV ČR, v.v.i.	REC	2
SmartMotion s.r.o.	PRC	2
STMicronics Design and Application, s.r.o.	PRC	2
REX Controls s.r.o.	PRC	2
others		13
<b>Total</b>		<b>91</b>

CZ participant - EuroHPC	Type	Participations
VŠB - TU Ostrava (IT4Innovations)	HES	6
Masarykova univerzita (CEITEC)	HES	1
<b>Total</b>		<b>7</b>

CZ participant - BBI	Type	Participations
Masarykova univerzita (CEITEC)	HES	1
Mikrobiologický ústav AV ČR, v.v.i.	REC	1
NAFIGATE Corporation, a.s.	PRC	1
SILON s.r.o.	PRC	1
Vysoké učení technické v Brně (FCH VUT)	HES	1
Výzkumný ústav veterinárního lékařství, v.v.i.	REC	1
Zemědělský výzkum, spol. s r.o.	REC	1
<b>Total</b>		<b>7</b>

CZ participant - IMI2	Type	Participations
Masarykova univerzita (2 CEITEC, 1 LF)	HES	3
Odysseus Data Services s.r.o.	PRC	2
Univerzita Karlova v Praze (2 1. LFK)	HES	2
Proton Therapy Center Czech s.r.o.	PRC	1
Mendelova zemědělská a lesnická univerzita v Brně (PEF)	HES	1
Mikrobiologický ústav AV ČR, v.v.i.	REC	1
MSD Czech Republic s.r.o.	PRC	1
<b>Total</b>		<b>11</b>

Source: e-Corda H2020 grant agreements and participants 09/2021, own data processing



# JTI H2020 – CZECH SUCCESSFUL PARTICIPANTS

CZ participant - S2R	Type	Participations
OLTIS Group a.s.	PRC	10
AŽD Praha, s.r.o.	PRC	7
Vysoké učení technické v Brně (FAST, FSI)	HES	2
Výzkumný ústav železniční, a.s.	PRC	2
ČD Cargo, a.s.	PRC	1
DT - Výhybkárna a strojírna, a.s.	PRC	1
KORDIS JMK, s.r.o.	PRC	1
KORID LK, spol. s r.o.	OTH	1
Masarykova univerzita (ESF)	HES	1
Správa železnic, státní organizace	PUB	1
UniControls, a.s.	PRC	1
Univerzita Pardubice (DFJP)	HES	1
<b>Total</b>		<b>29</b>

CZ participant - SESAR	Type	Participations
Řízení letového provozu České republiky, s.p.	PRC	35
Honeywell International, s.r.o.	PRC	5
AgentFly Technologies s.r.o.	PRC	1
EVEKTOR, spol. s r.o.	PRC	1
UpVision s.r.o.	PRC	1
Vysoké učení technické v Brně (FIT)	HES	1
<b>Total</b>		<b>44</b>

CZ participant - CS2	Type	Participations
Výzkumný a zkušební letecký ústav, a.s.	REC	12
EVEKTOR, spol. s r.o.	PRC	6
Honeywell International, s.r.o.	PRC	6
LA composite, s.r.o.	PRC	4
GE Aviation Czech s.r.o.	PRC	2
Jihostroj, a.s.	PRC	2
Vysoké učení technické v Brně (FIT, FSI)	HES	2
others		10
<b>Total</b>		<b>44</b>

CZ participant - FCH2	Type	Participations
Vysoká škola chemicko-technologická v Praze (FCHT)	HES	3
Elmarco s.r.o.	PRC	1
Ministerstvo vnitra ČR	PUB	1
Senior Flexonics Czech s.r.o.	PRC	1
Ústav fyziky materiálů AV ČR, v. v. i.	REC	1
Ústav makromolekulární chemie AV ČR, v.v.i.	REC	1
<b>Total</b>		<b>8</b>

Source: e-Corda H2020 grant agreements and participants 09/2021, own data processing





# CARBODIN 881814 (S2R-OC-IP1-01-2019)



Consortium



**CARBODIN** will improve car body shell manufacture by exploring the possibilities offered by composite materials. To this end, CARBODIN advocates for a modular tooling to manufacture a wide range of parts. In addition, the proposed process will combine different production techniques, automation concepts, introduction of co-cured and co-bonded composite parts and multi-material integrated joints and inserts. Besides, predictive maintenance will be reinforced by testing intelligent sensor nodes.

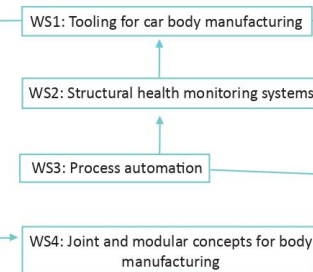
Composite materials will also be the core idea for cost-efficient doors with reduced Life Cycle Costs (LCC). The creation of modular tooling combined with 3D technology will enable the production of lighter doors with enhanced thermal and acoustic properties in the door and its vicinity.

**CARBODIN** will facilitate the design of train interiors by developing a configuration tool based on virtual reality. This will be complemented by innovative manufacturing tools for interior components. Other strategies for improving cost-effectiveness of manufacturing processes such as the integration of low-volt circuits in panels will be also explored.

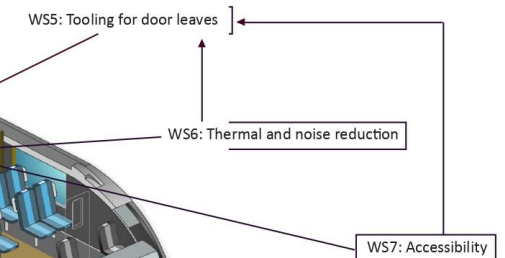
**CARBODIN** also aims at improving the performance of the future Human-Machine Interactions (HMI) system through a European survey to identify key interactions such as drivers' gestures or voices.

## Concept

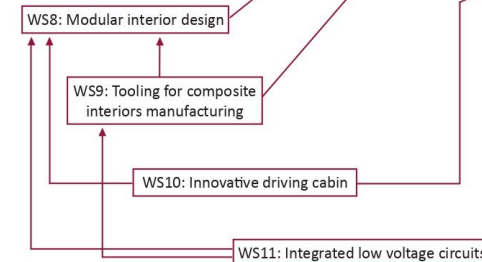
### Car Body Shell



### Doors



### Interiors



## Facts and figures

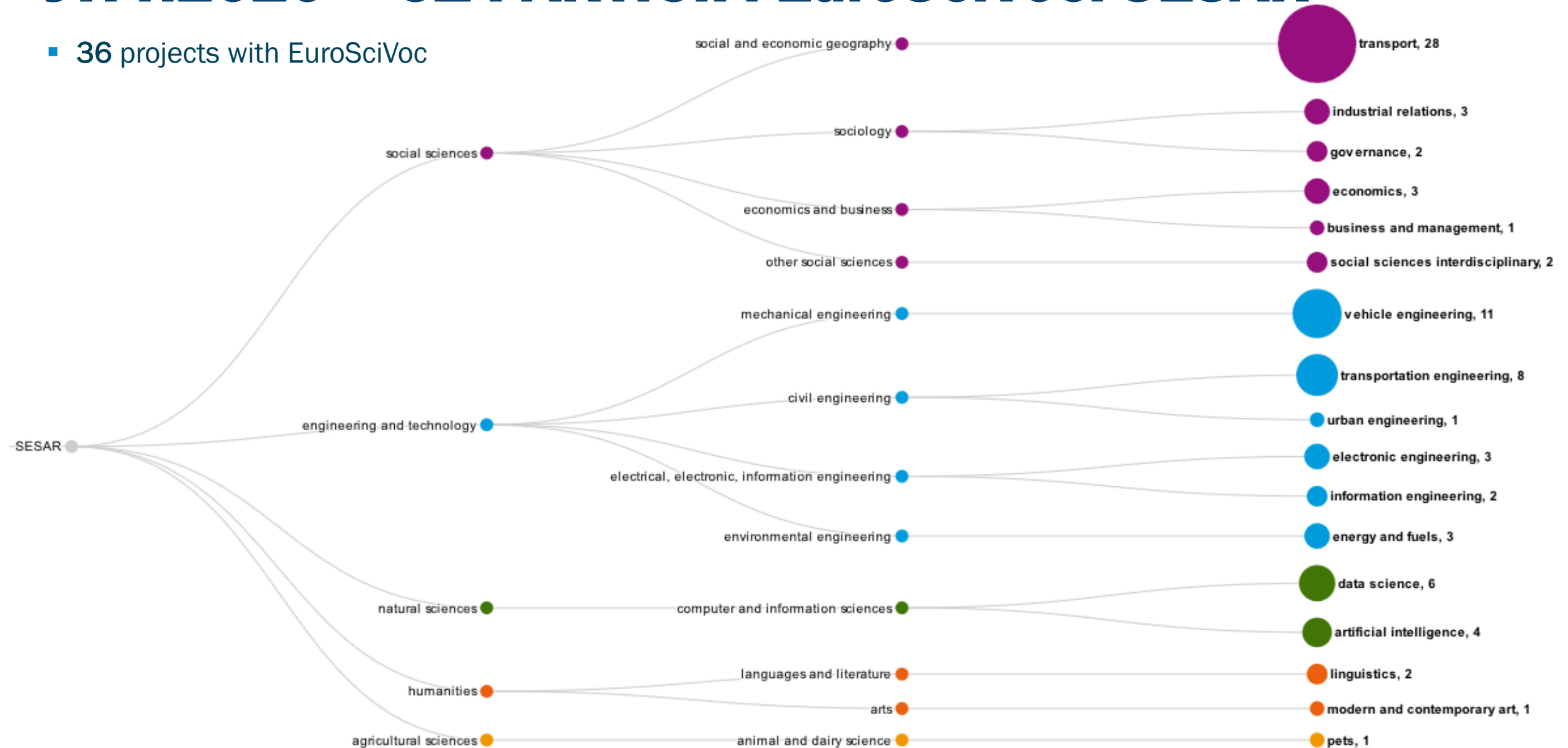
- Acronym: CARBODIN
- H2020-S2RJU-OC-2019
- Grant agreement n° 881814
- EU contribution: 3.5 m€
- Project coordinator: FUNDACIO EURECAT
- Duration: 24 months
- Project start date: 01/12/2019
- Project end date: 30/11/2021
- Partners: 14 partners from 7 countries: Spain, Greece, Poland, Italy, Germany, France, Czech Republic
- Shift2Rail Open Call "S2R-OC-IP1-01-2019: Advanced Car body shells for railways and light material and innovative doors and train modularity"

Source: <https://cordis.europa.eu/project/id/881814/reporting>



# JTI H2020 – CZ PARTICIP. EuroSciVoc: SESAR

- 36 projects with EuroSciVoc

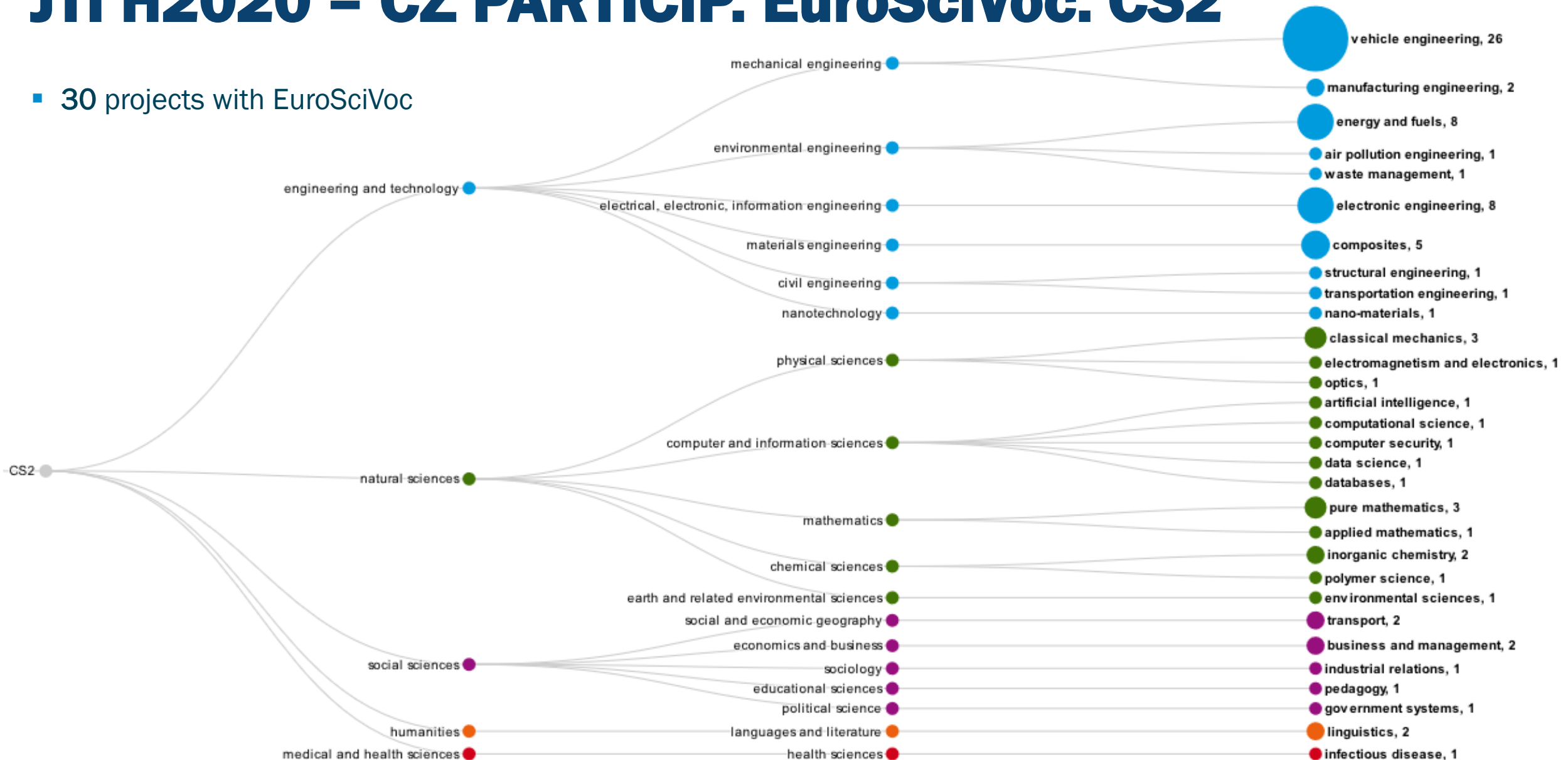


Source: e-Corda H2020 grant agreements and participants 09/2021, own data processing



# JTI H2020 – CZ PARTICIP. EuroSciVoc: CS2

- 30 projects with EuroSciVoc



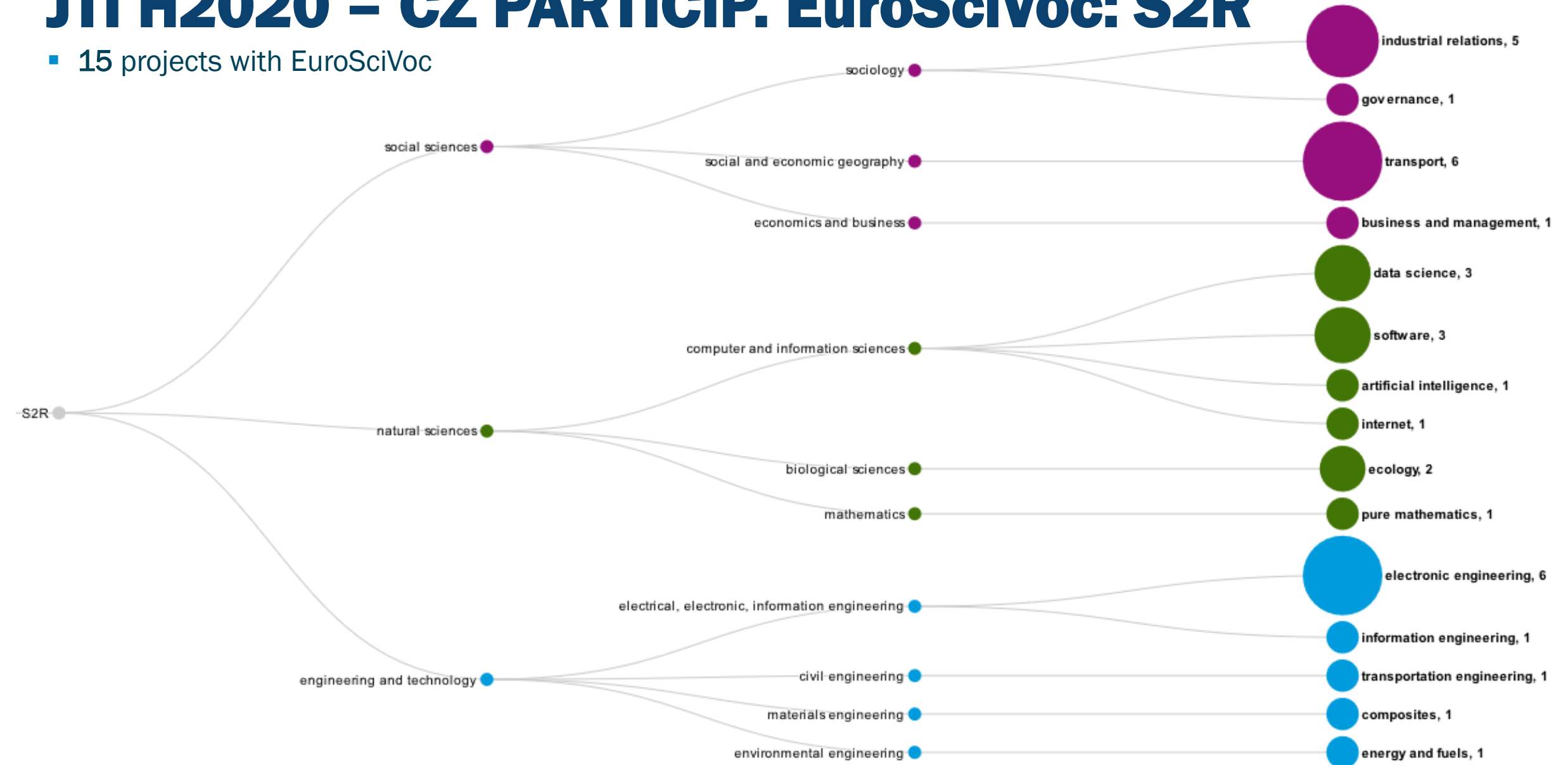
Source: e-Corda H2020 grant agreements and participants 09/2021, own data processing





# JTI H2020 – CZ PARTICIP. EuroSciVoc: S2R

- 15 projects with EuroSciVoc

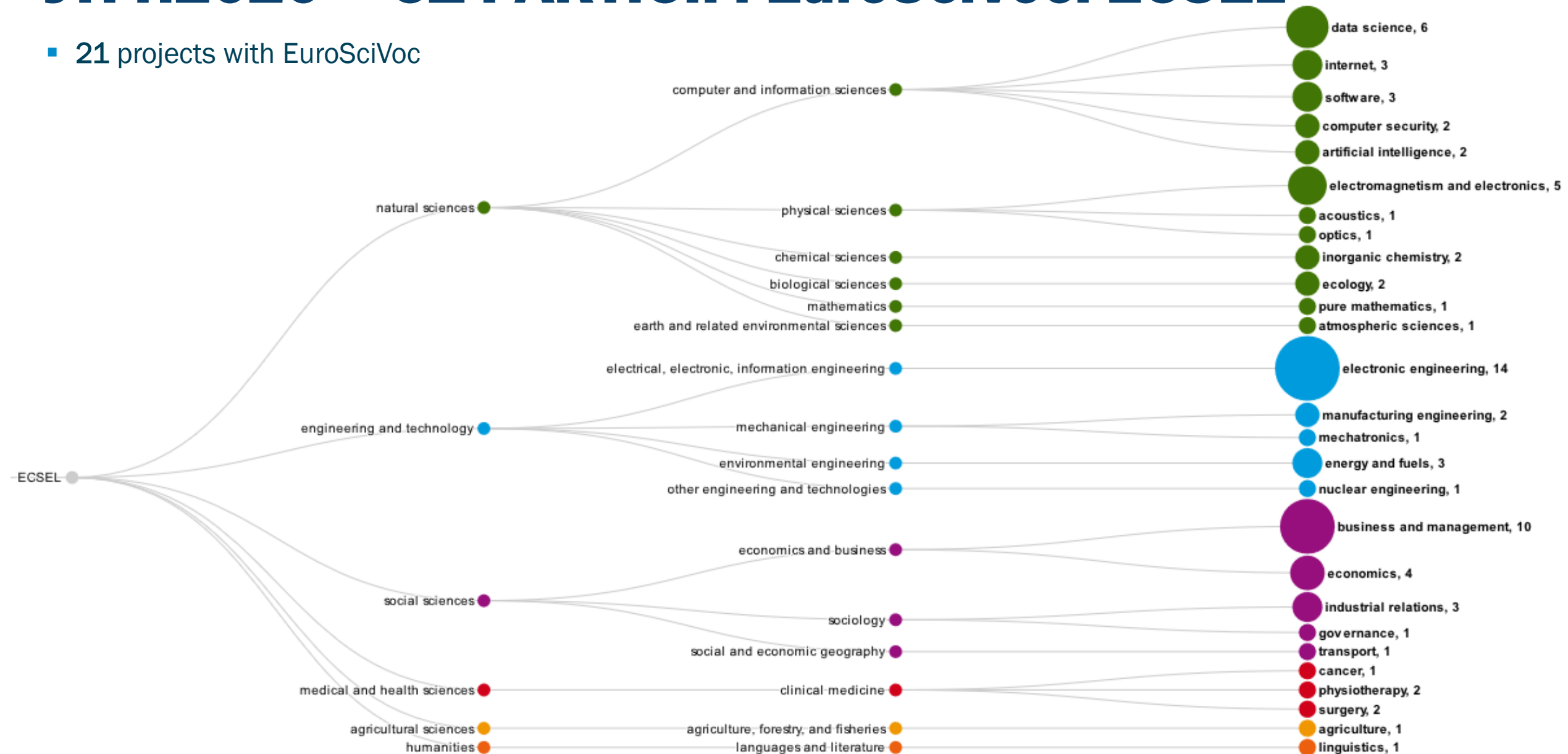


Source: e-Corda H2020 grant agreements and participants 09/2021, own data processing



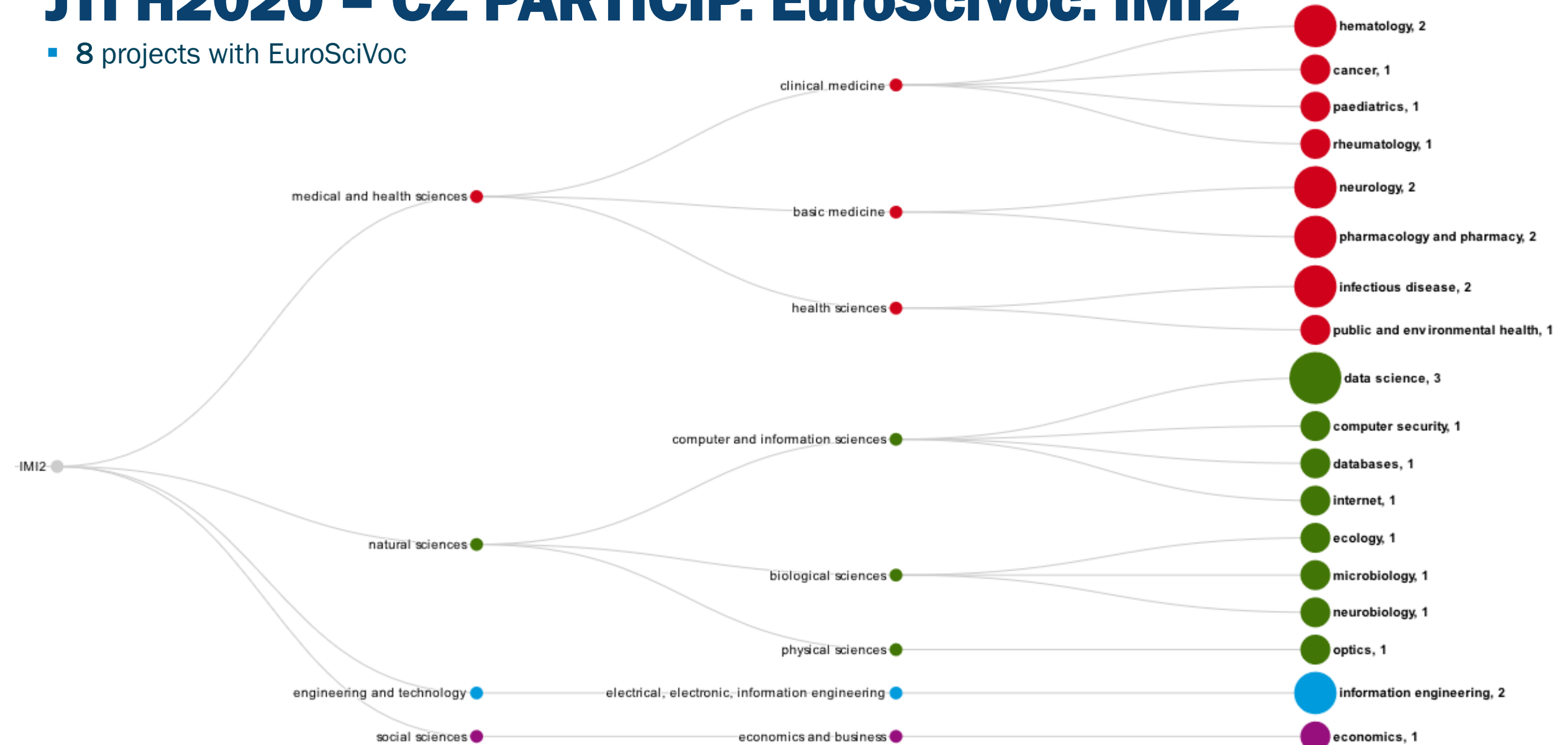
# JTI H2020 – CZ PARTICIP. EuroSciVoc: ECSEL

- 21 projects with EuroSciVoc



# JTI H2020 – CZ PARTICIP. EuroSciVoc: IMI2

- 8 projects with EuroSciVoc

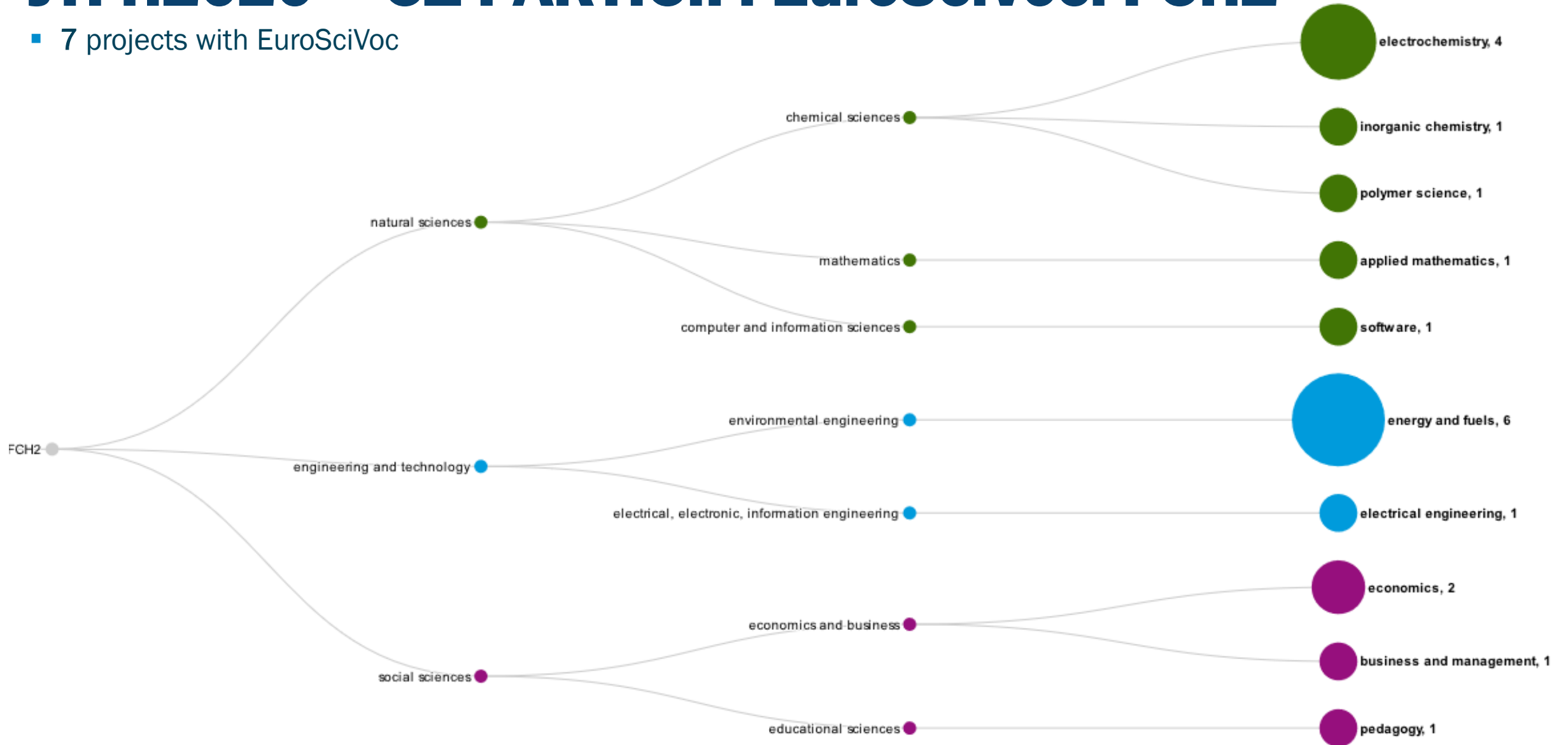


Source: e-Corda H2020 grant agreements and participants 09/2021, own data processing



# JTI H2020 – CZ PARTICIP. EuroSciVoc: FCH2

- 7 projects with EuroSciVoc

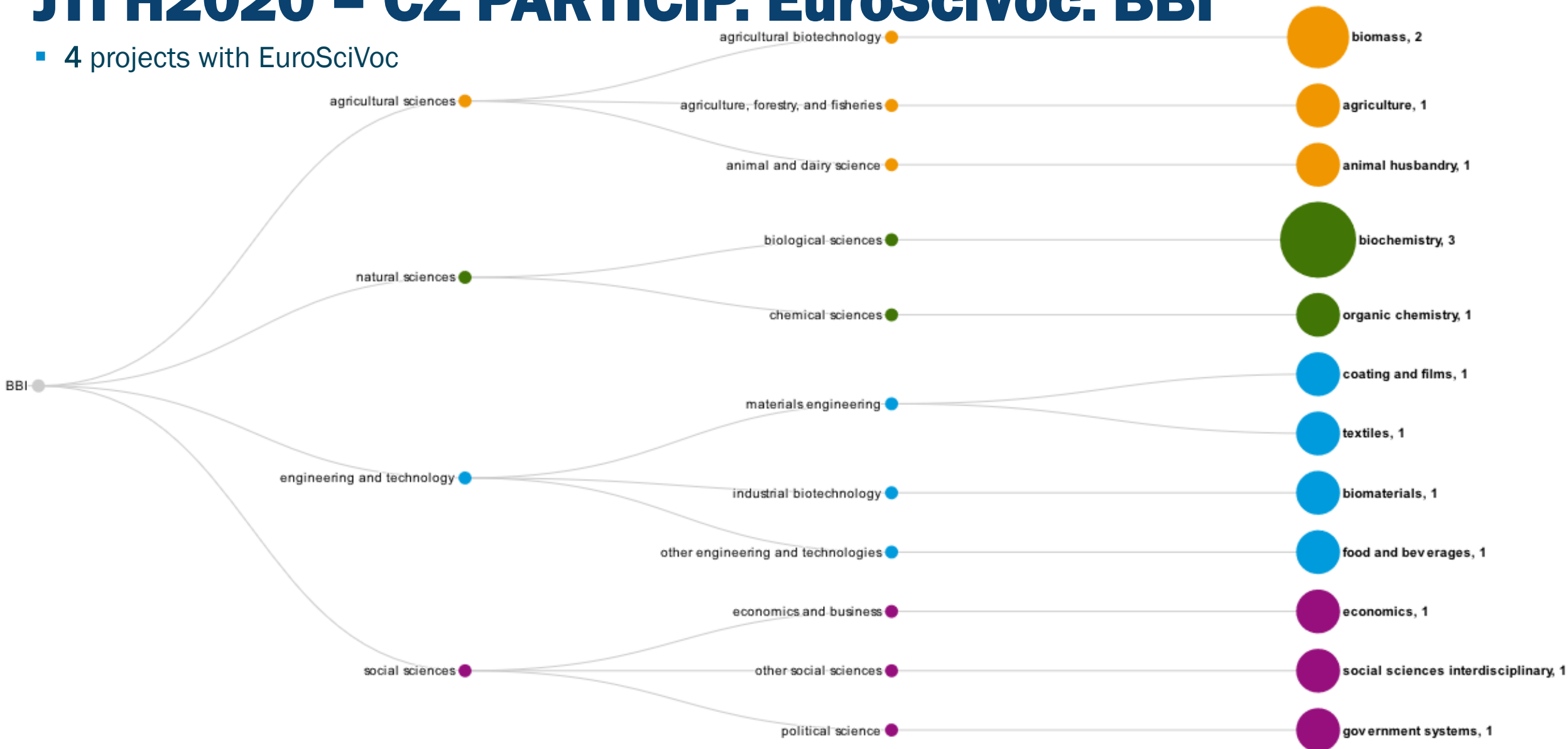


Source: e-Corda H2020 grant agreements and participants 09/2021, own data processing



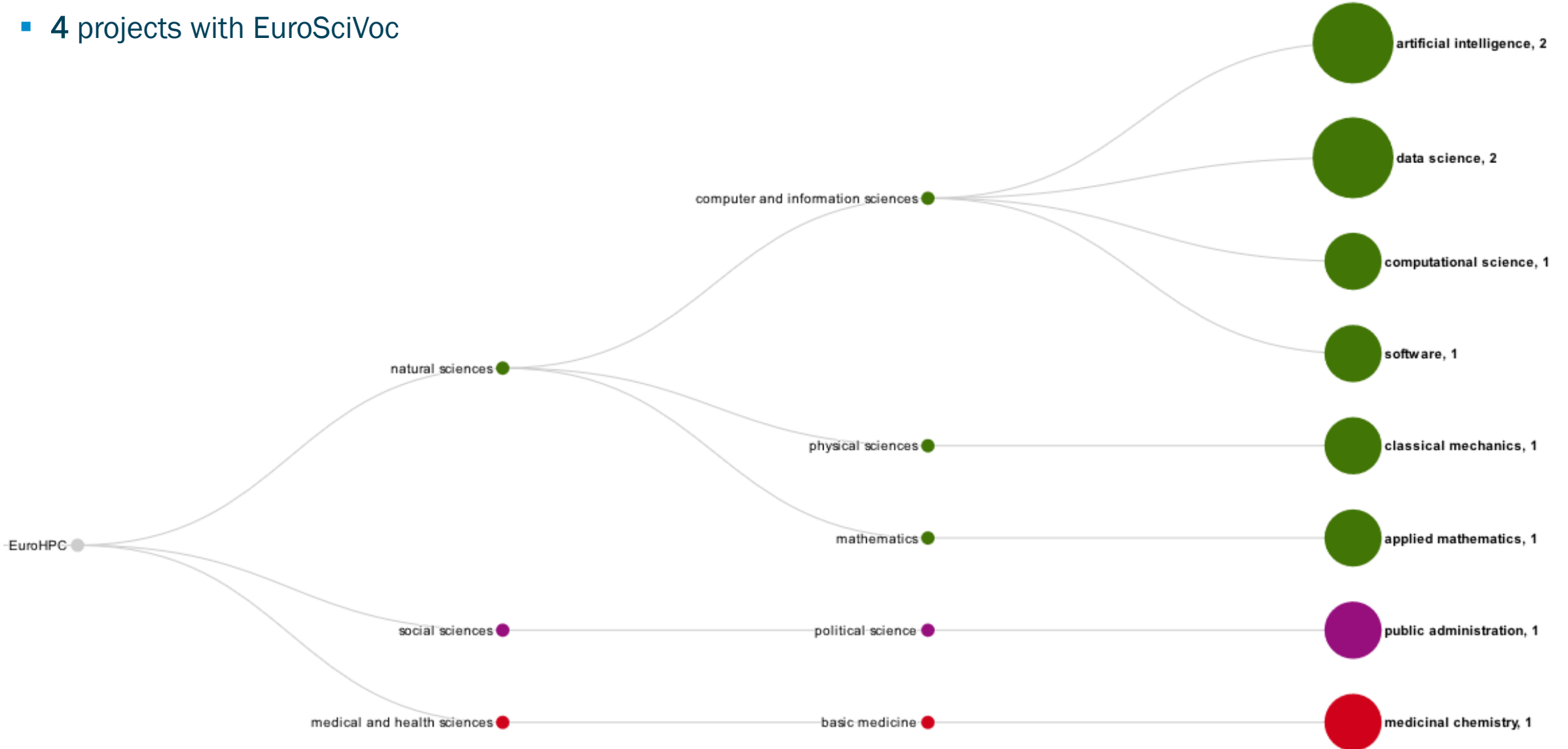
# JTI H2020 – CZ PARTICIP. EuroSciVoc: BBI

- 4 projects with EuroSciVoc



# JTI H2020 – CZ PARTICIP. EuroSciVoc: EuroHPC

- 4 projects with EuroSciVoc



Source: e-Corda H2020 grant agreements and participants 09/2021, own data processing



# JOINT UNDERTAKINGS

**IMI:** <http://www.imi.europa.eu/>



**ECSEL:** <http://www.ecsel-ju.eu/>



**Clean Sky:** <http://www.cleansky.eu/>



**Shift2Rail:** <http://www.shift2ra>



**FCH:** <http://www.fch-ju.eu/>



**EuroHPC:** <https://eurohpc-ju.europa.eu/>



**BBI:** <http://bbi-europe.eu/>



**SESAR:** <https://www.sesarju.eu/>



**THANK YOU VERY MUCH FOR  
YOUR ATTENTION !😊**







# CONTACT

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