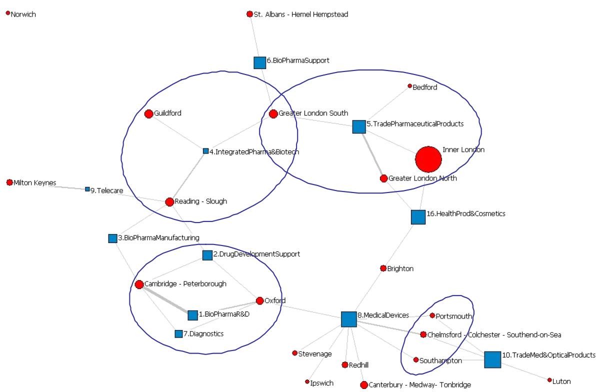
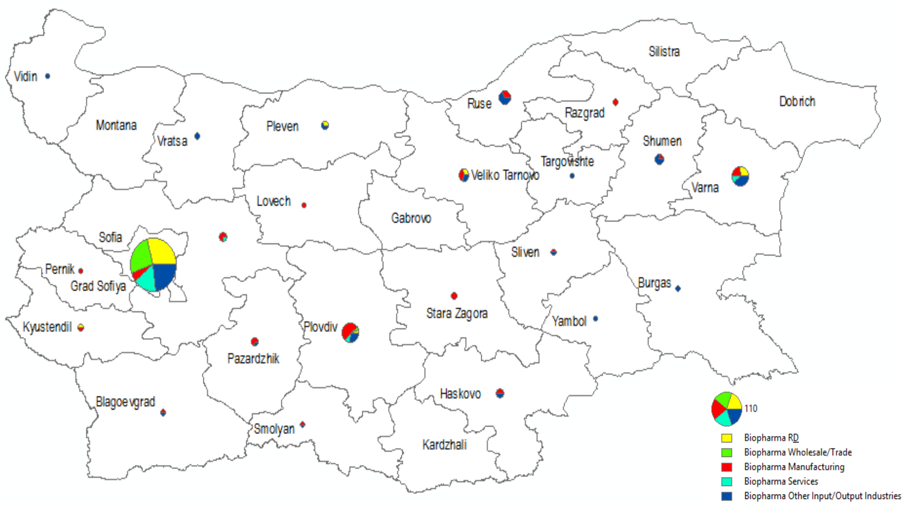
Mapping Value Chains & Regional / Sectoral Capabilities

Prof Emanuela Todeva, 2018

Previous Work

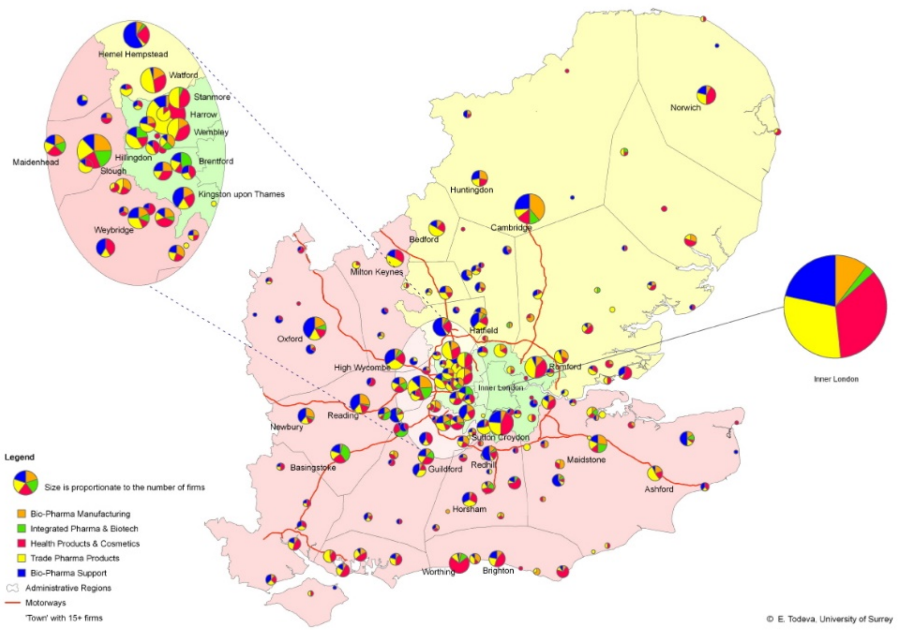
- ➢ Business Clusters
- ➢ Business Networks
- ➢ Strategic Alliances
- ➢ Partnerships & Collaborative Relations in International Business Context
- ➢ Mapping of Capabilities
- ➢ Global Value Chains





Mapping Methodology

- Building bespoke and comprehensive datasets with firms
- Data analysis & data categorisation using network analysis and cluster analysis techniques
- Mapping geographic concentrations of capabilities
- Mapping strategic diversification of firms and scale and scope of their value chains using industry codes
- Mapping business portfolios using ownership data

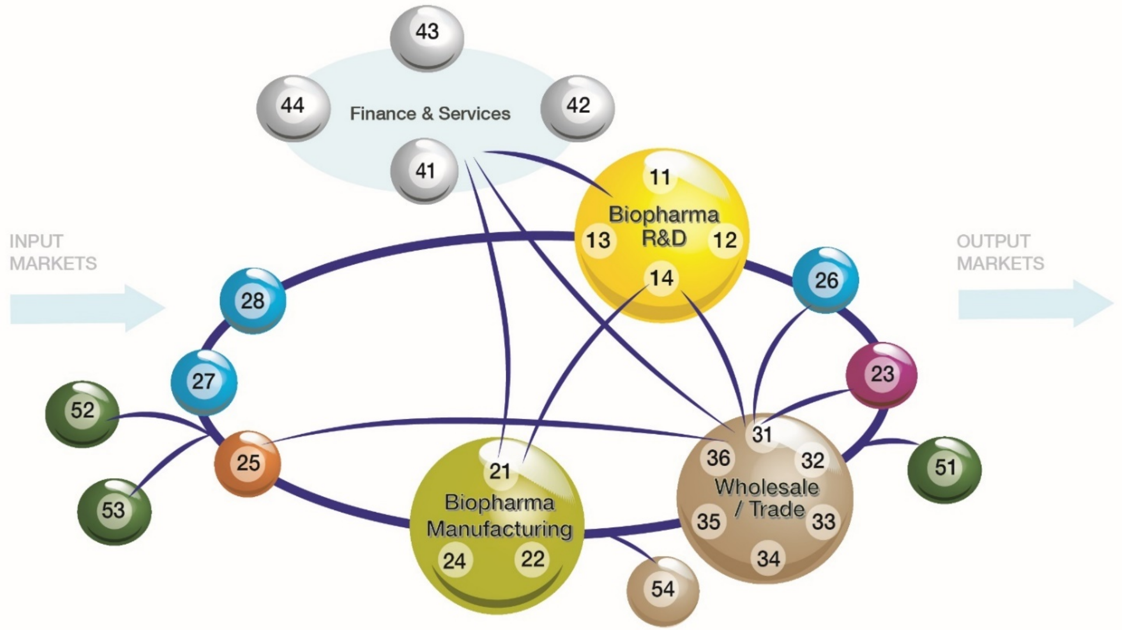


- From DATA – to data CATEGORISATION
- Mapping of ACTORS and RELATIONS across
  - Firms
  - Industry capabilities (*NACE codes*)
  - Geographic location
- Intelligence on PRIVATE SECTOR CAPABILITIES

Biopharma Global Value Chain Flows

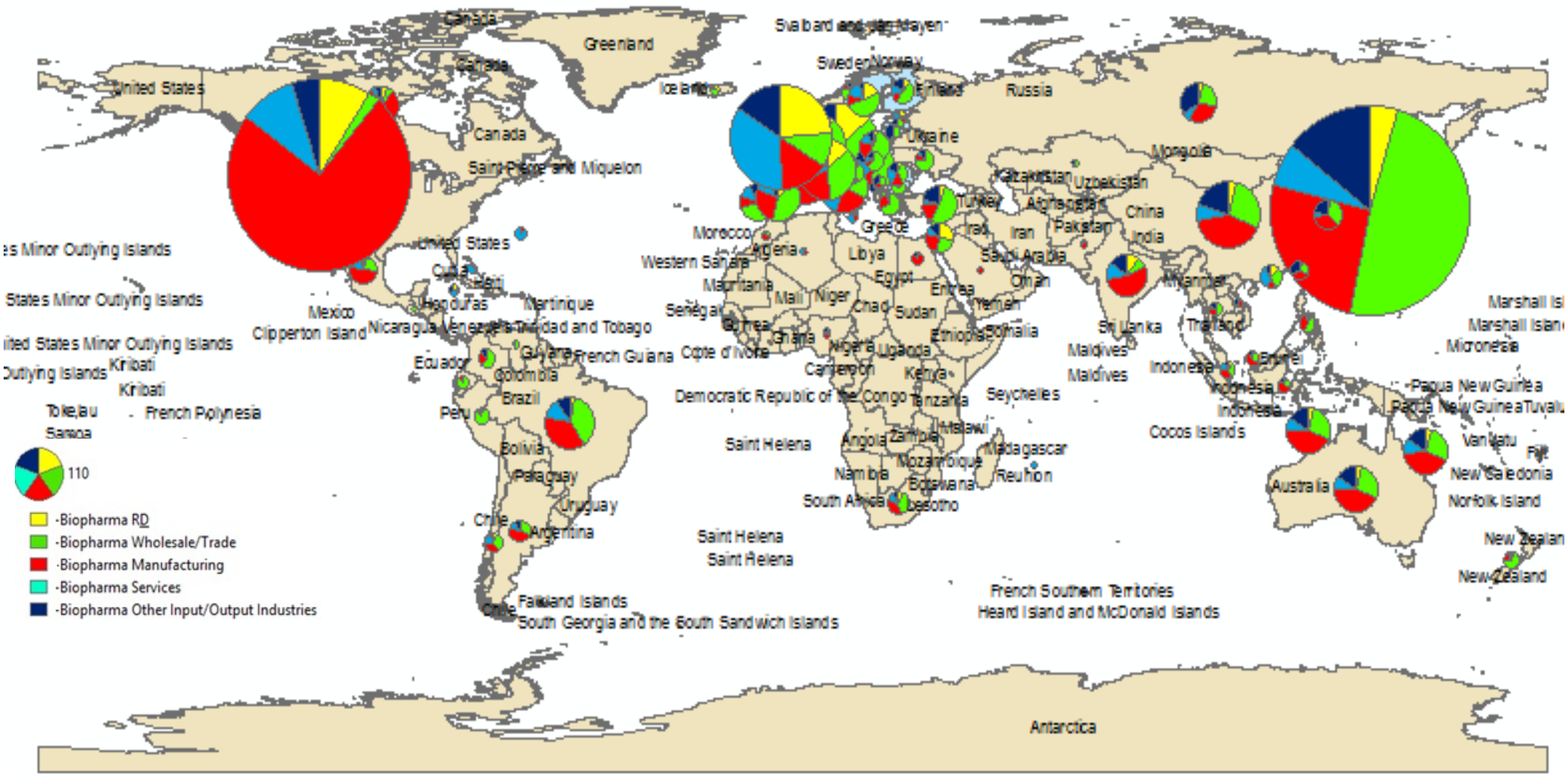
Mapping ownership and supply relationships of the top 20,508 firms that participate in the Biopharma GVC

Number	Cluster
11	Biopharma R&D
12	Biopharma R&D & manufacturing
13	Biopharma R&D & services diversified
14	Clinical research & human health activities
21	Bio-pharma manufacturing
22	Biopharma manufacturing and wholesale
23	Perfumes and cosmetics manufacturing
24	Biopharma manufacturing multi-diversified
25	Chemical & biopharma manufacturing diversified
26	Medical instruments, dental & electrotherapeutic manufacturing
27	Manufactured goods, electronics and instruments
28	Special purpose machinery and equipment
31	Specialised biopharma wholesale
32	Biopharma retail
33	Biopharma & cosmetics wholesale
34	Pharma wholesale trade & services diversified
35	Chemical & biopharma wholesale
36	Medical & hospital equipment wholesale & supplies
41	Holding, financial & administrative head office services
42	Other business and management services
43	Finance & insurance services
44	Miscellaneous services
51	Agriculture, food processing & drinks of bio products
52	Manufactured miscellaneous goods
53	Electricity, gas and water supply & services
54	Other miscellaneous wholesale

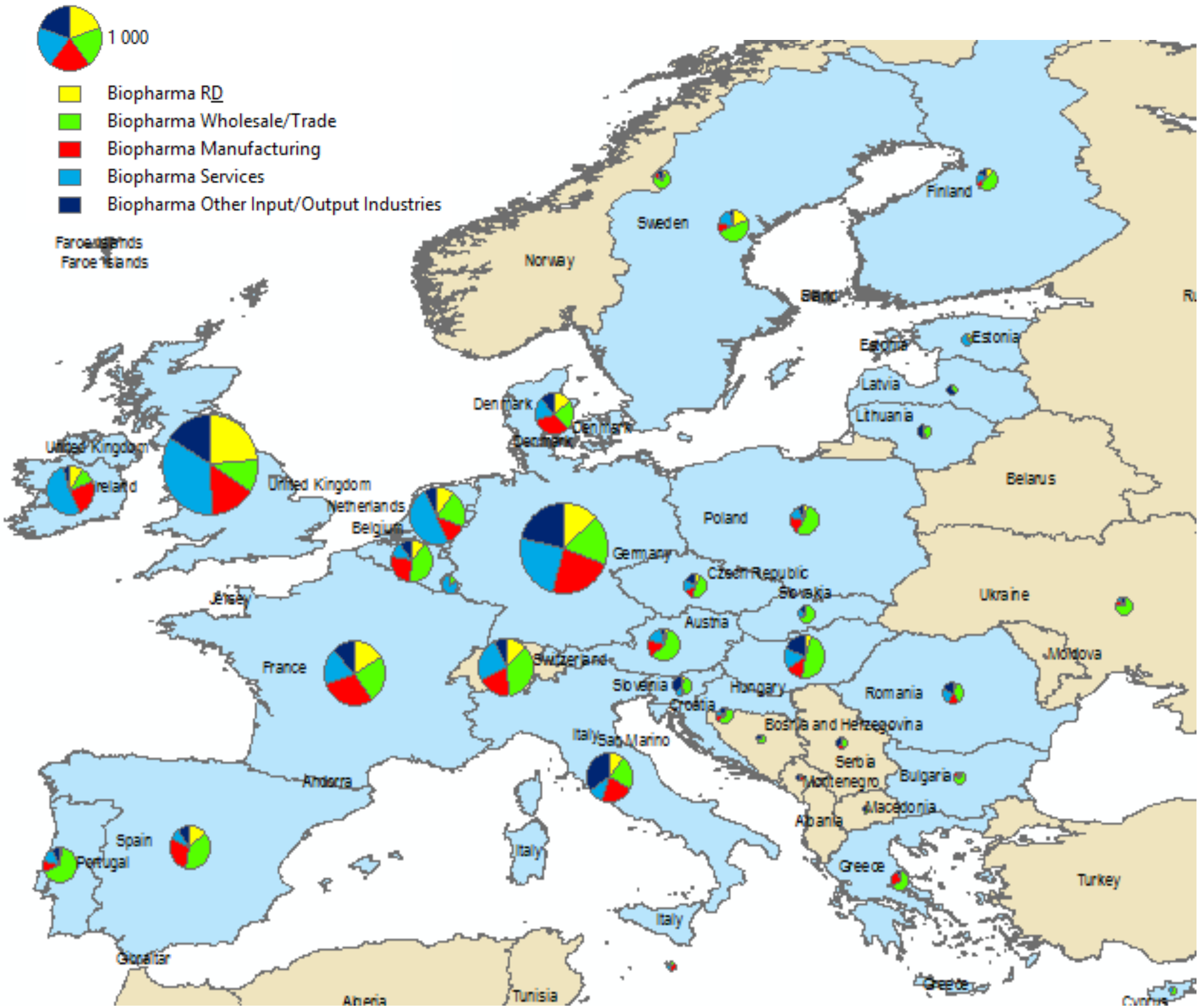


- Biopharma is the fastest growing sector in Europe, attracting the largest proportion of investment, with 77 multinational firms and 6,505 operating establishments (2015)
- The average R&D investment by the parents is over €53 mln (2013) with average profits of €49 mln (2013) and revenue from sales over €512 mln (2013)
- Biopharma GVC is entangled in finance, business and management services, and wholesale, retail, trade services that secure financing of the R&D and the manufacturing operations
- There is simultaneously increasing specialization within firms, and new emergent diversification portfolios
- The GVC is pulled by the output markets, including pharma wholesale and retail (31, 32), cosmetics (23), medical instruments, dental, hospital and electro-therapeutic manufacturing (26) and agro-food, drinks and bio-products (51)
- Innovation from all other sectors is integrated in the biopharma GVC, including chemicals, plastics, eco-bio products, miscellaneous products, miscellaneous services, medical and hospital services

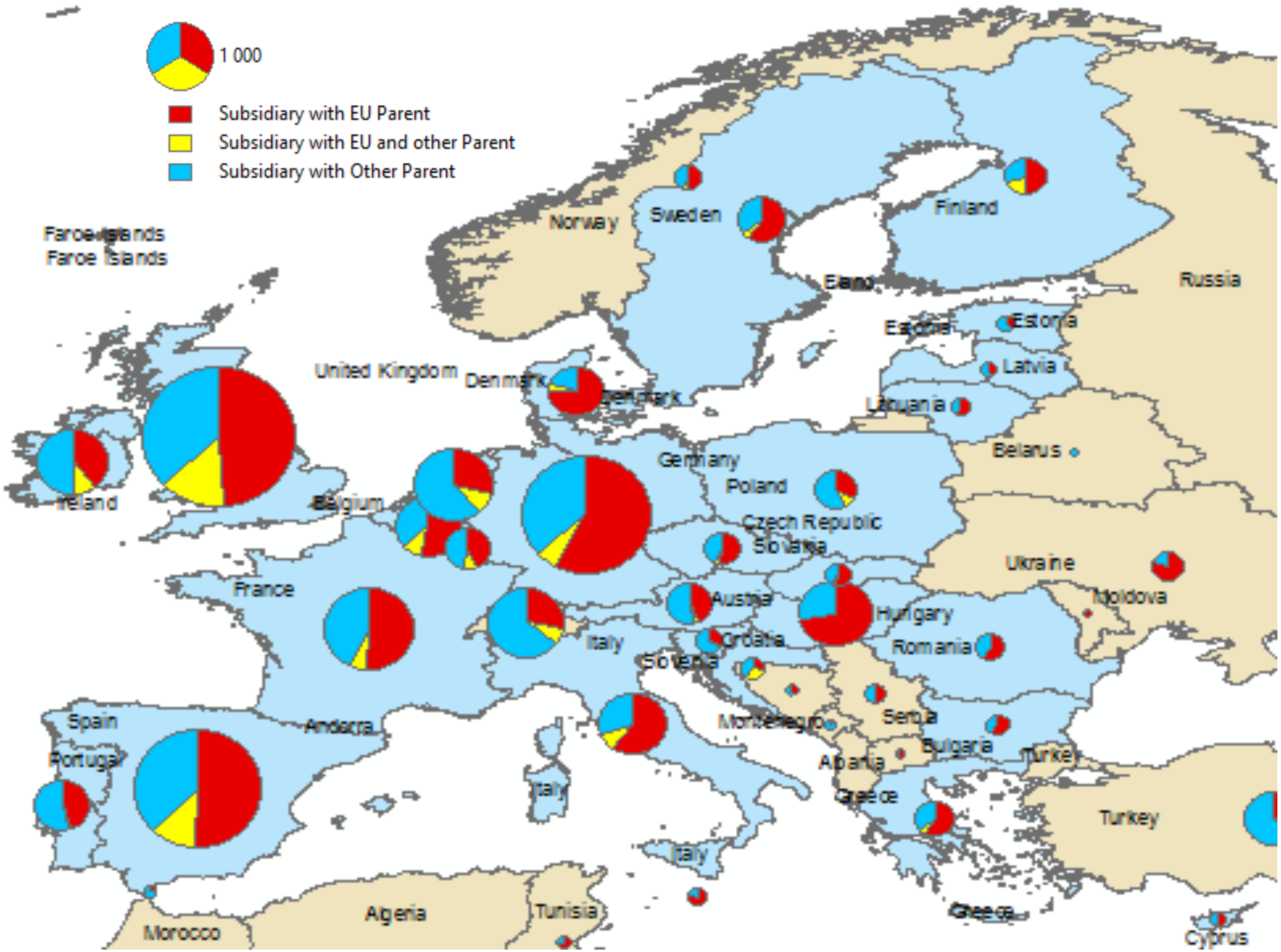
Global Biopharma (Bespoke dataset 2015: 20508 firms)



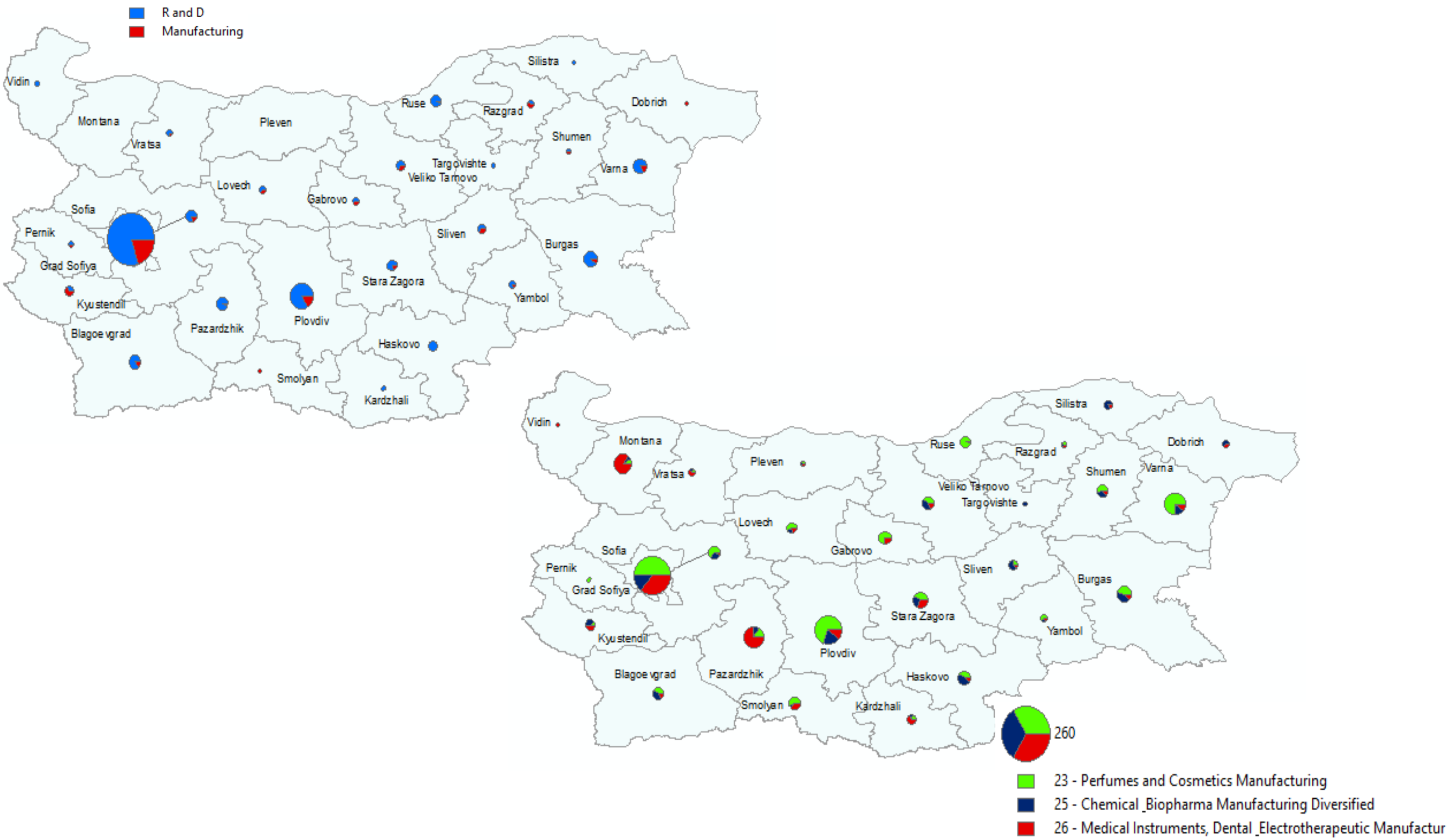
European Parents and Subsidiaries
(6505 firms)



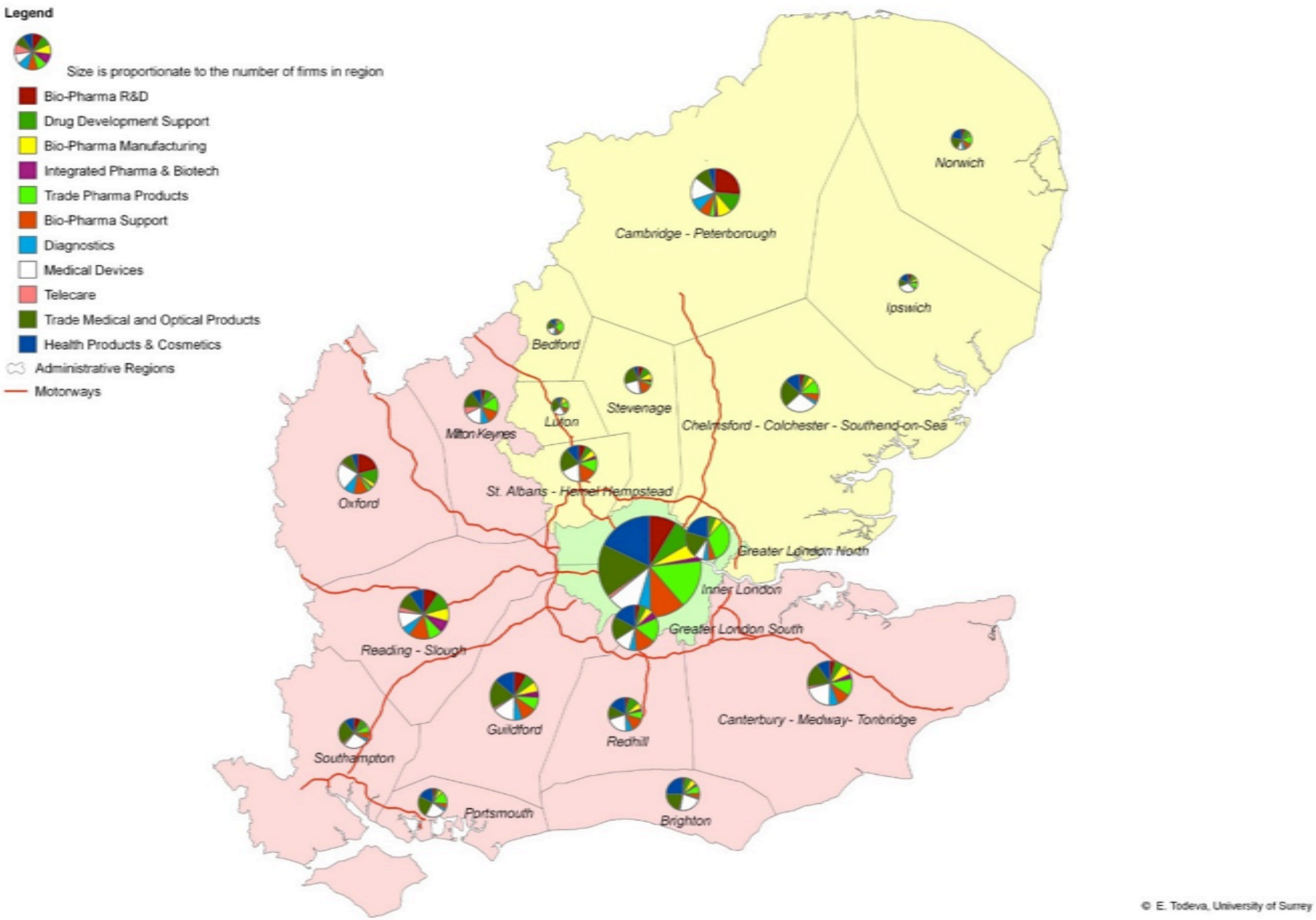
Subsidiaries by Source of Ownership (EU vs Other, 29,237 firms)



Competitive Strengths of the Bulgarian Biopharma (2015)



Bespoke GSE (UK) biomedical and biopharma dataset (2008)



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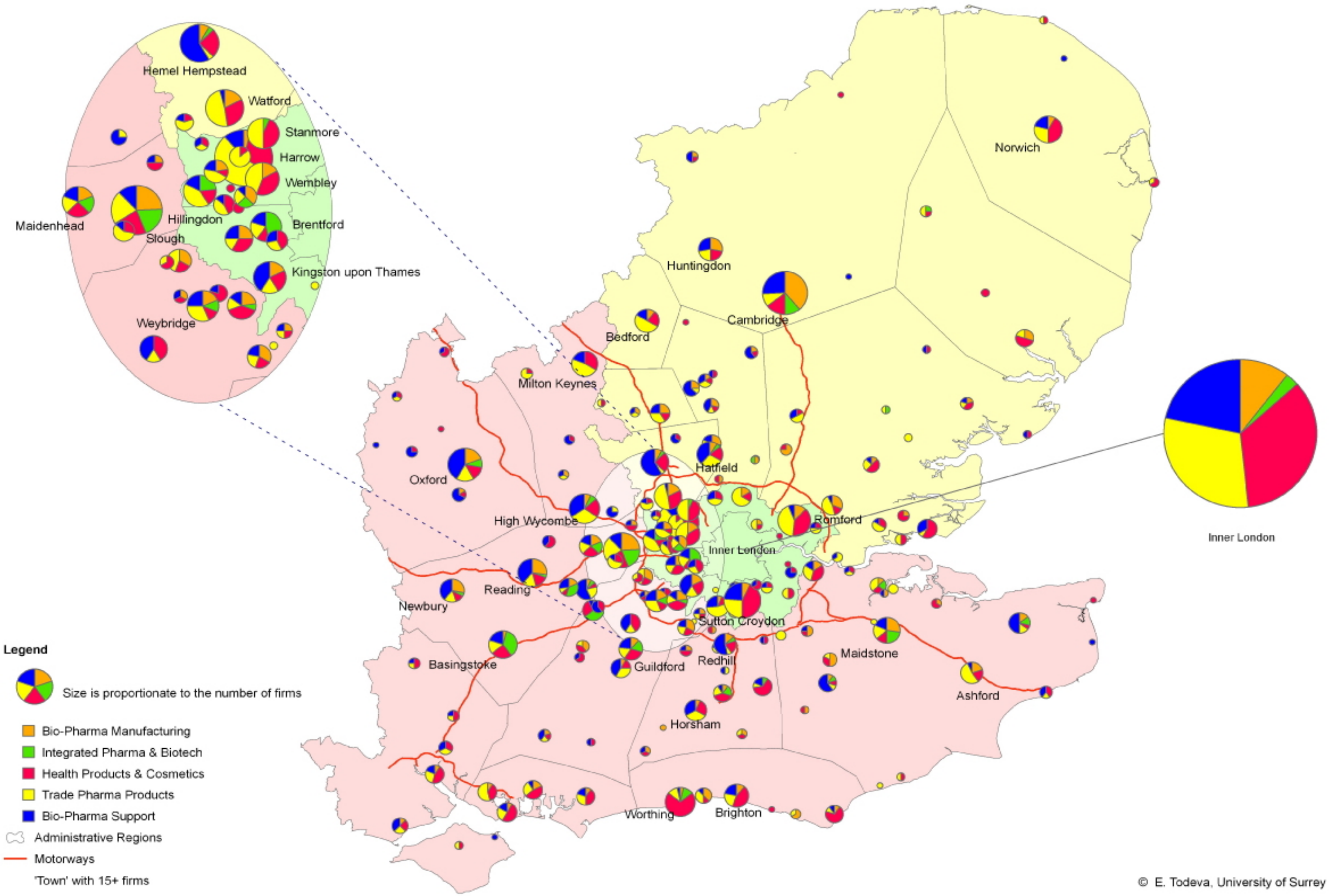
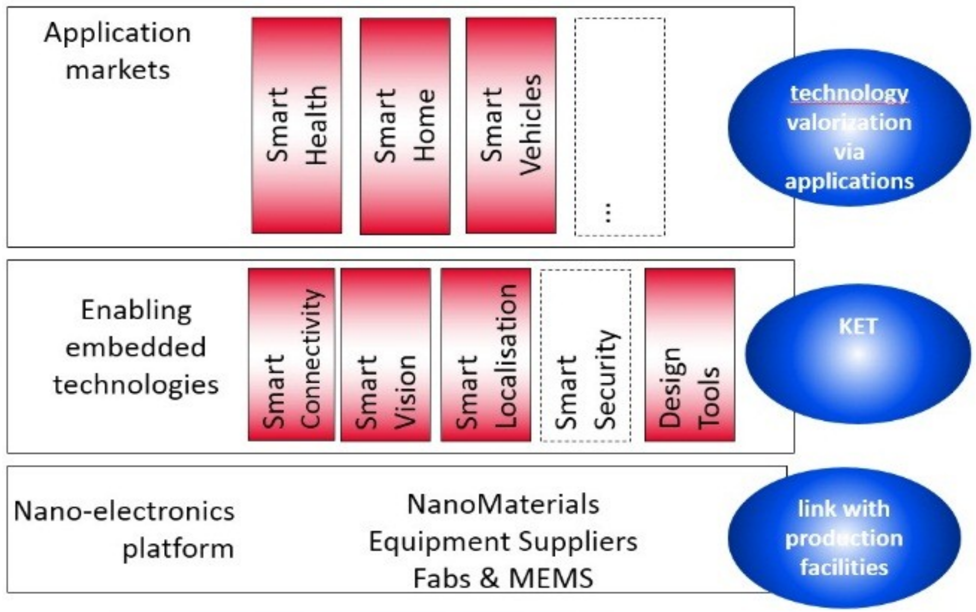


Mapping of Cluster Capabilities – The Case of System Integrators

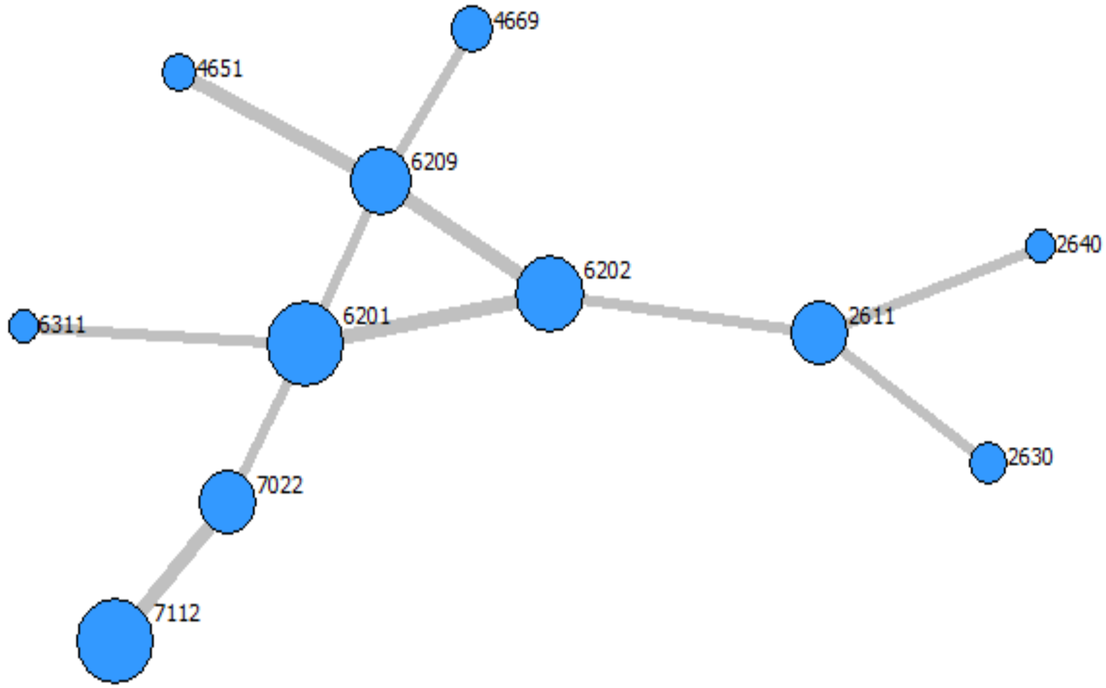
- Mapping of cluster capabilities for **DSP Valley (Flanders – BE2)** - an independent cluster of excellence in **smart electronic systems** and **embedded technology solutions**
- DSP Valley groups 100+ members: universities, research institutes and companies, from small start-ups, over SMEs to large international groups with a local R&D activity
- Established in 1996, as a private initiative co-founded by Philips (International Technology Centre Leuven), Imec and KULeuven
- Cross-border co-operation between neighboring regions - ELAT (Eindhoven – Leuven – Aachen Technology Triangle)

- **Obtained a database of all of their members (59 members + 73 direct subsidiaries + the corporate portfolio of the Parent (Global Ultimate Owner [GUO] – total of 1037 firms**
- **Obtained the concentration of codes / capabilities (certain categories of head-offices and business Services excluded)**



Mapping of the Smart Systems Value Chain

2611	Manufacture of electronic components
2630	Manufacture of communication equipment
2640	Manufacture of consumer electronics
4651	Wholesale of computers, computer peripheral equipment and software
4669	Wholesale of other machinery and equipment
6201	Computer programming activities
6202	Computer consultancy activities
6209	Other information technology and computer service activities
6311	Data processing, hosting and related activities
7022	Business and other management consultancy activities
7112	Engineering activities and related technical consultancy



- **Value-chain integrators**
  - **2611**
  - **6201**
  - **6202**
  - **6209**

Sectoral Boundaries
(of the Smart Systems Cluster in Belgium)

2611 - Manufacture of electronic components
2620 - Manufacture of computers and peripheral equipment
2630 - Manufacture of communication equipment
2640 - Manufacture of consumer electronics
2651 - Manufacture of instruments and appliances for measuring, testing and navigation
2660 - Manufacture of irradiation, electromedical and electrotherapeutic equipment
2670 - Manufacture of optical instruments and photographic equipment
2711 - Manufacture of electric motors, generators and transformers
2790 - Manufacture of other electrical equipment
283 - Manufacture of agricultural and forestry machinery
2899 - Manufacture of other special-purpose machinery nec.
3030 - Manufacture of air and spacecraft and related machinery
3250 - Manufacture of medical and dental instruments and supplies
5829 - Other software publishing
6201 - Computer programming activities
6202 - Computer consultancy activities
6203 - Computer facilities management activities
6209 - Other information technology and computer service activities
6311 - Data processing, hosting and related activities
6312 - Web portals

7112 - Engineering activities and related technical consultancy
7120 - Technical testing and analysis
7219 - Other research and experimental development on natural sciences and engineering

DSP Global Value Chain

		59 firms *cluster members*	GUO of 59 firms	Subsidiaries of 59 firms	Other firms with the same GUO as 59 firms	Subsidiaries of firms with the same GUO as 59 firms	Total
	Total	59	21	73	287	597	1037
Belgium	BE	47	4	13	13	6	83
Netherlands	NL	9	2	11	21	20	63
Germany	DE	2	1	5	17	20	45
France	FR	1	1	7	16	19	44
USA	US		10	5	58	204	277
Switzerland	CH		1		7	13	21
Ireland	IE		1		7	15	23
China	CN			8	8	25	41
Brazil	BR			4	3	10	17
Portugal	PT			3	2	1	6
Czech Republic	CZ			2	4	1	7
India	IN			2	1	9	12
Luxembourg	LU			2	4	14	20
Austria	AT			1	3	1	5
Colombia	CO			1	1	1	3
Spain	ES			1	7	3	11
United Kingdom	GB			1	8	24	33
Hong Kong	HK			1	3	13	17
Italy	IT			1	8	15	24
Malaysia	MY			1	2	4	7
Poland	PL			1	4	3	8
Sweden	SE			1	5	6	12
Singapore	SG			1	3	11	15
Turkey	TR			1	3	4	8

Members in	4 EU countries
Parents in	6 EU countries + USA
Subsidiaries of the members	22 countries (incl. 11 EU countries
Total portfolio	71 countries

Value Chains and Value Chain Integrators for High-Tech Farming

- Multinational Enterprises (MNEs)
- Finance and Business Services
- Wholesale / Trade

- Cross-section Technologies
- Private sector Implementation Services
- High-tech System Integrators

- Preliminary analysis reveals that the value chains of the two segments (FARMING + HIGH TECH) are disconnected
  - Which segments of the value chain have the potential to become INTEGRATORS FOR High Tech farming?
    - NACE: 0161, 0130, 0119, 8130 …

- European value chains are entangled in global technology and resource flows
  - How regional capabilities are connected to national and pan-European value chains?
    - Connectivity is limited and mostly within the selected regions

- Regional concentrations of firms participate differently in input and output markets. Diversified regions are leading in value chain integration.

VC1: Tree nursery, viticulture, fruits (TREES)

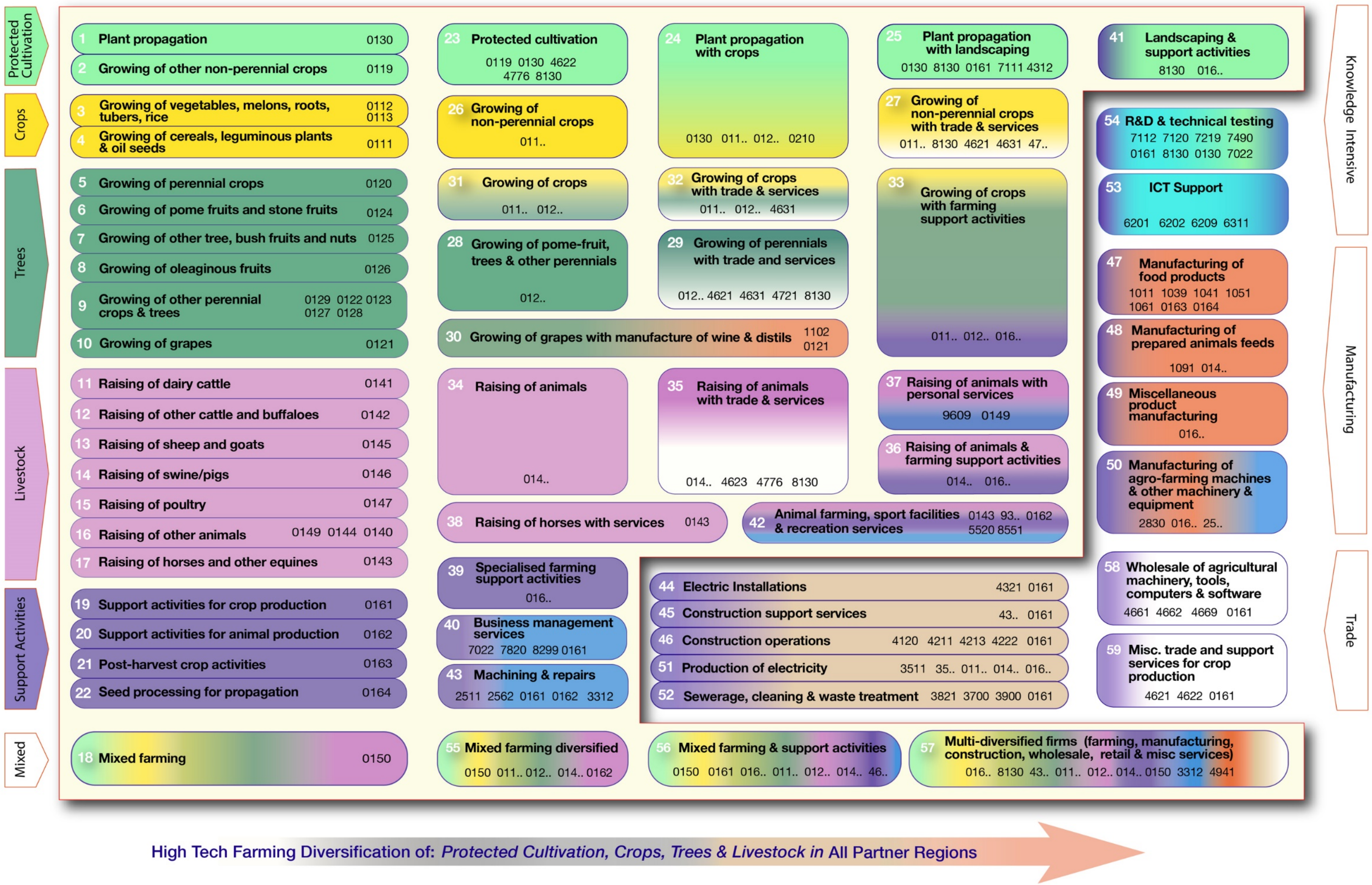
VC2: Livestock (outdoor & indoor)

VC3: Arable, cereals, vegetables (CROPS)

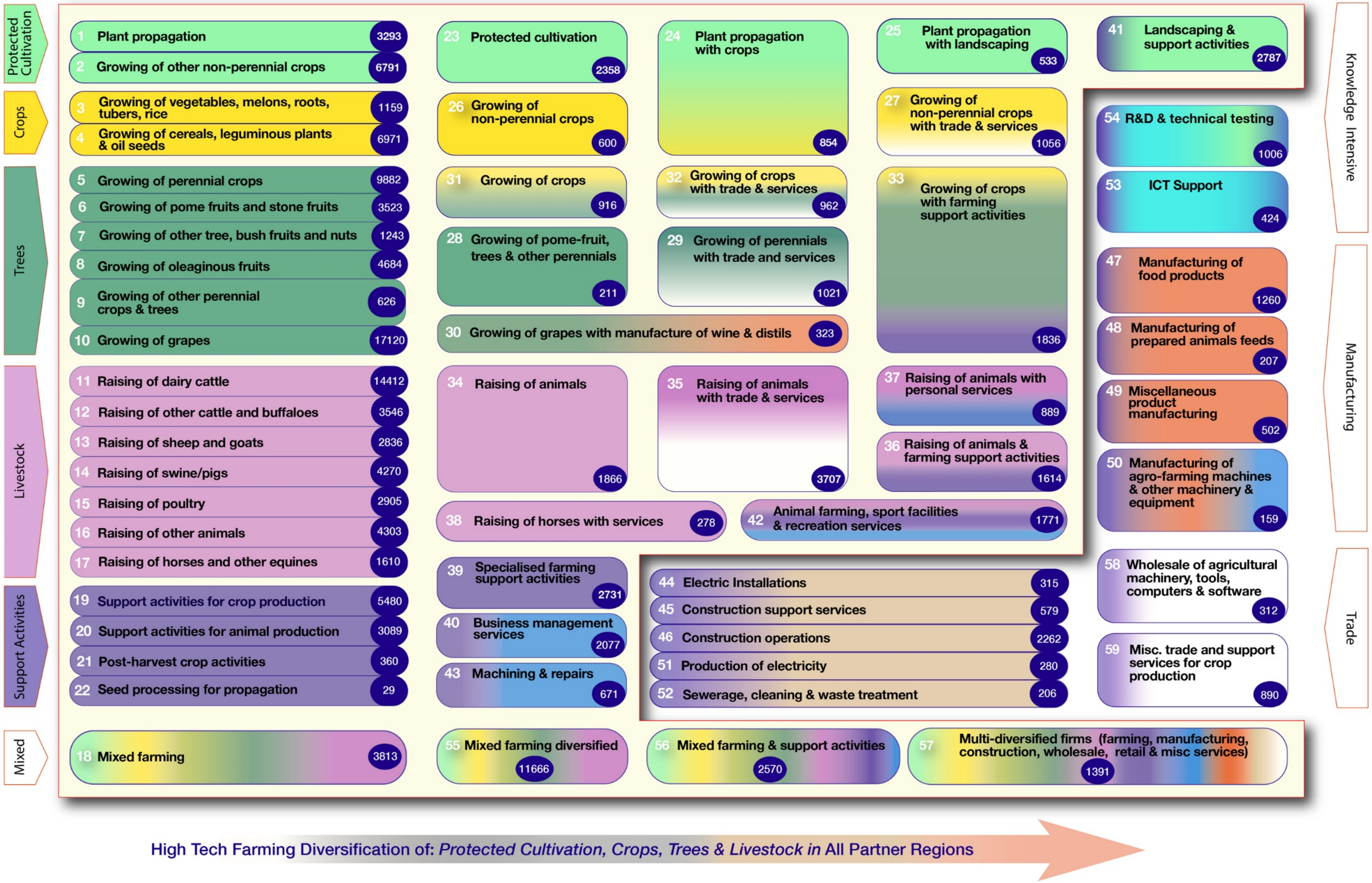
VC4: Protected cultivation (different types of greenhouses, highly intensive)

Region	NUTS	VC1	VC2	VC3	VC4
Estonia	EE		1	1	
Flanders	BE2	1	1	1	1
Centre Portugal	PT16	1	1	1	1
Weser-Ems Landkreis Osnabrück AgritecNet cluster	DE94	1	1	1	
Central Macedonia	EL52	1	1	1	1
West Macedonia	EL53	1	1		
Galicia	ES11	1	1	1	
Extremadura	ES43	1	1	1	
South Ostrobothnia	FI194		1	1	
Pays de la Loire	FR51	1		1	1
Toscana - ITI1	ITI1	1	1	1	1
Marche	ITI3	1		1	
Veneto	ITH3	1	1	1	
Emilia-Romagna	ITH5	1	1	1	
North East Romania	RO21	1		1	
East Sweden Region Östergötland	SE12		1	1	
Northern Netherlands	NL1		1		
Gelderland	NL22	1			
Noord Holland	NL32			1	1
Zuid Holland	NL33	1			1
North-Brabant	NL41		1		
Limburg (NL)	NL42	1			1
Norther Ireland	UKN		1	1	

High-Tech Farming Value Chain



Concentration of Capabilities in High-Tech Farming *(number of firms across the partnering regions)*



Future Applications

- Clusters
- Pilot Cases
- NUTS 3 level mapping of capabilities
- KETs
- Measuring sectoral internationalization and / or European scope of the value chain