



Energy & Agrifood in the
EU and Greece
Emerging Insights

Haris Papageorgiou
Athena Research Center

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EXPLORING EU'S ENERGY AND AGRIFOOD INNOVATION LANDSCAPES

- Our goal is to support policy makers & administrators in the full life-cycle processes of policies by turning the huge **amounts of dynamic, multilingual and heterogeneous data** into actionable insights and evidence-based policy-making.
- We built an STI AI-enabled platform for evidence-based, participatory policymaking in the STI domain.
- This presentation provides a sample analysis of innovation within the EU's energy and agrifood sectors, offering a glimpse into the insights that this type of data-driven analysis can provide and showcasing the analytical capabilities of the approach, revealing opportunities for informed policymaking and strategic innovation.

Business Question

- **Scope: AgriFood, Energy, Health, ... industrial ecosystems**
- **BQ1: To what extent did the investments in Research and Innovation lead to industrial application of the results, considering the Uptake of technologies resulting from Research and Innovation activities in public research Institutions and the internal use of R&I results obtained by enterprises. What are the major trends in green tech, in which EU countries ?**
- **BQ2:**

Policy/Business Question

Interaction with Analysts

Policy Assistant



ALL THE

Datasets

TO DEAL WITH



OpenAIRE



Augmented LLMs

{ API }

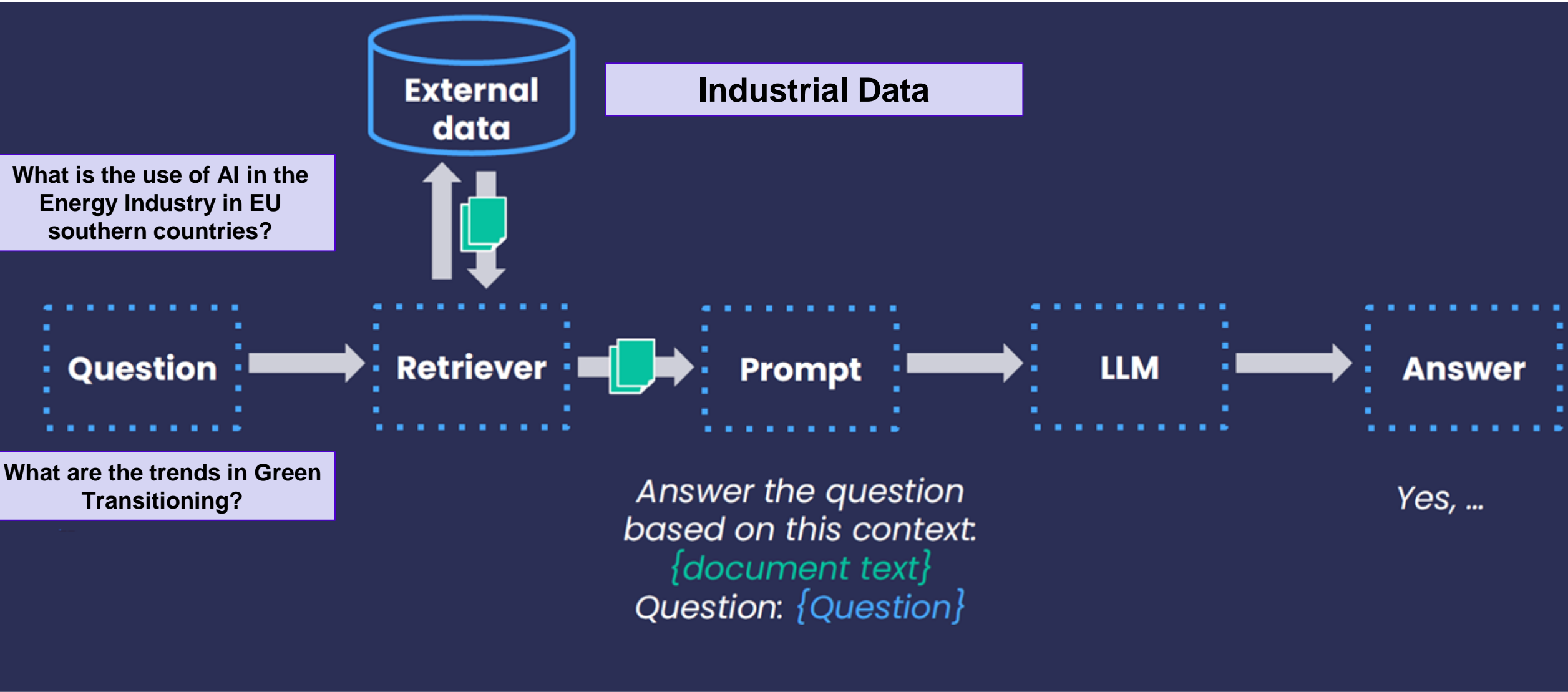
STI Analysis

Patent Analysis

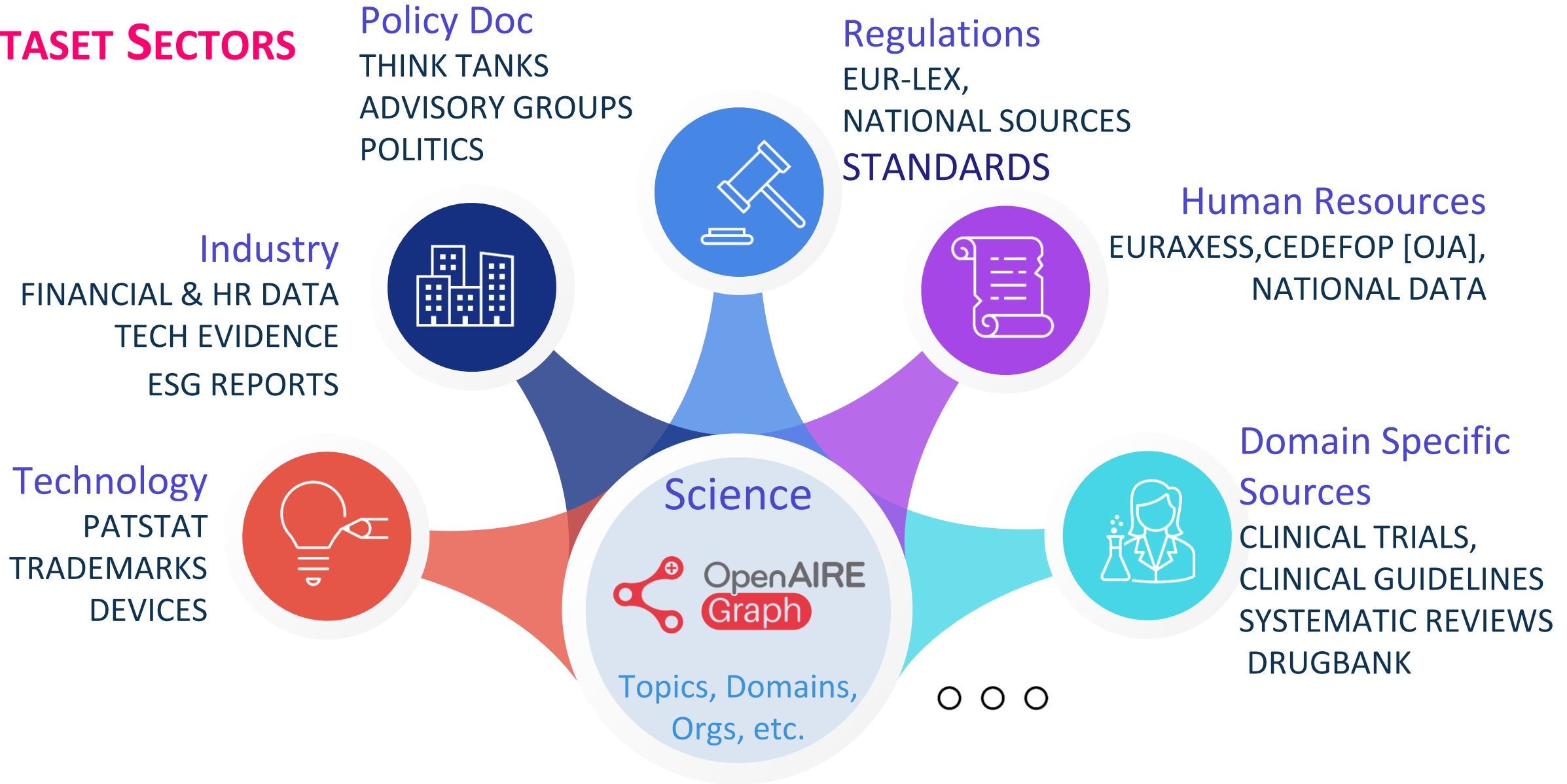
Industry Analysis

Trademarks

Data Quality



DATASET SECTORS

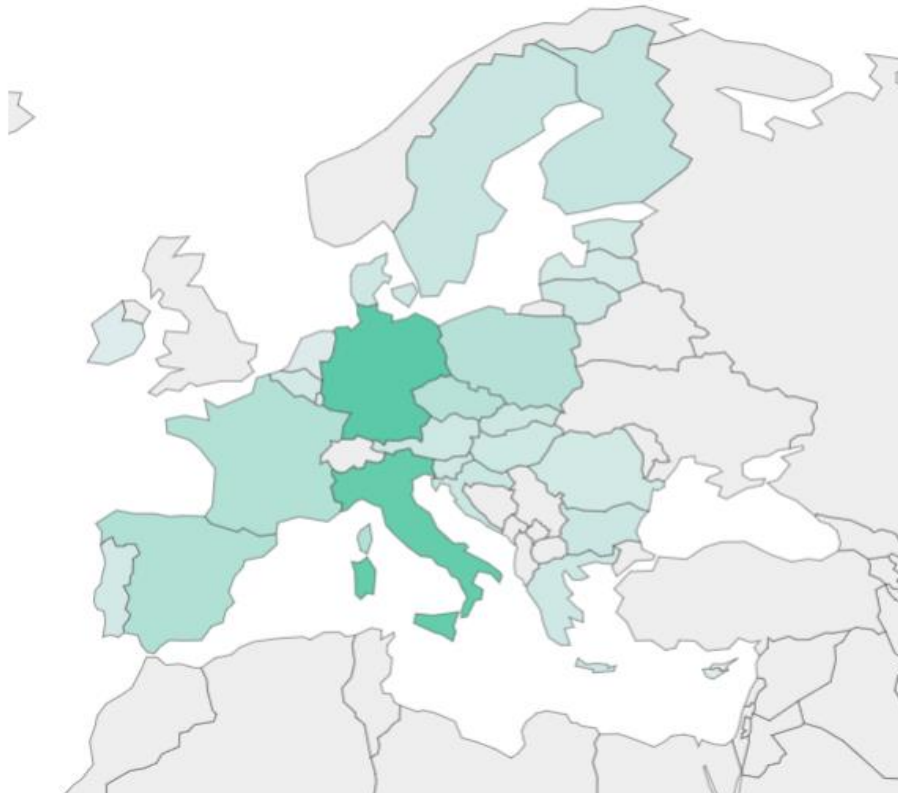


ENERGY – EU – INDUSTRY

Mapping the energy landscape:

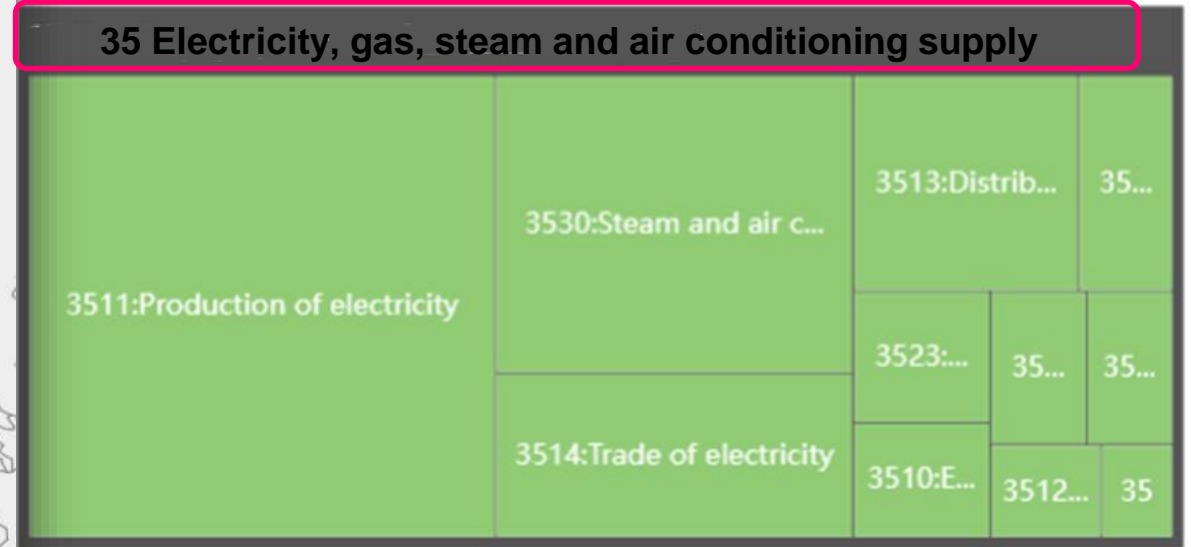
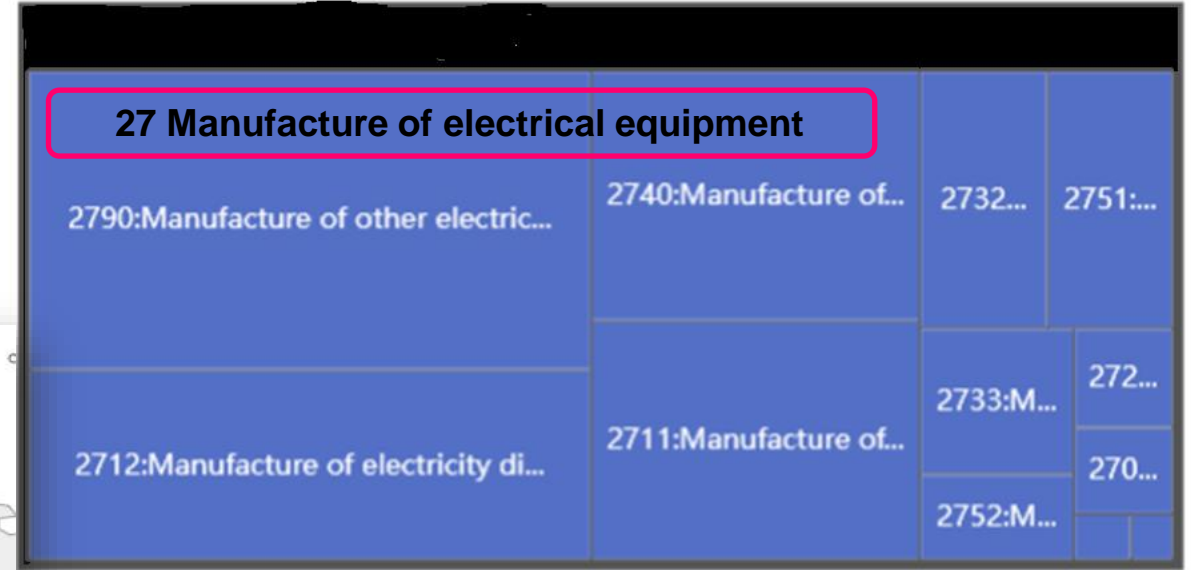
company distributions by NACE codes and EU countries (EUROSTAT, REGISTRIES, WEB)

Number of Companies by Country



Germany & Italy lead in # of companies in energy

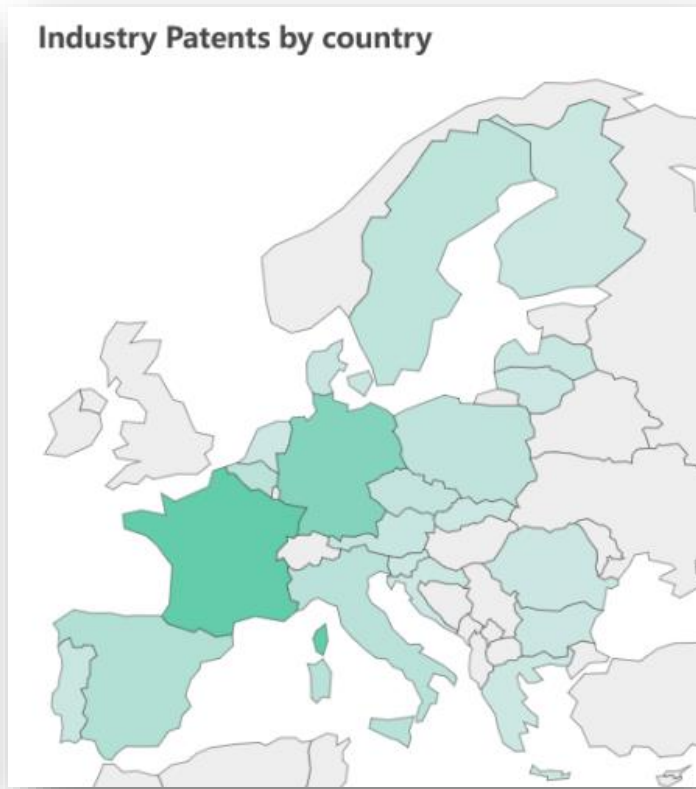
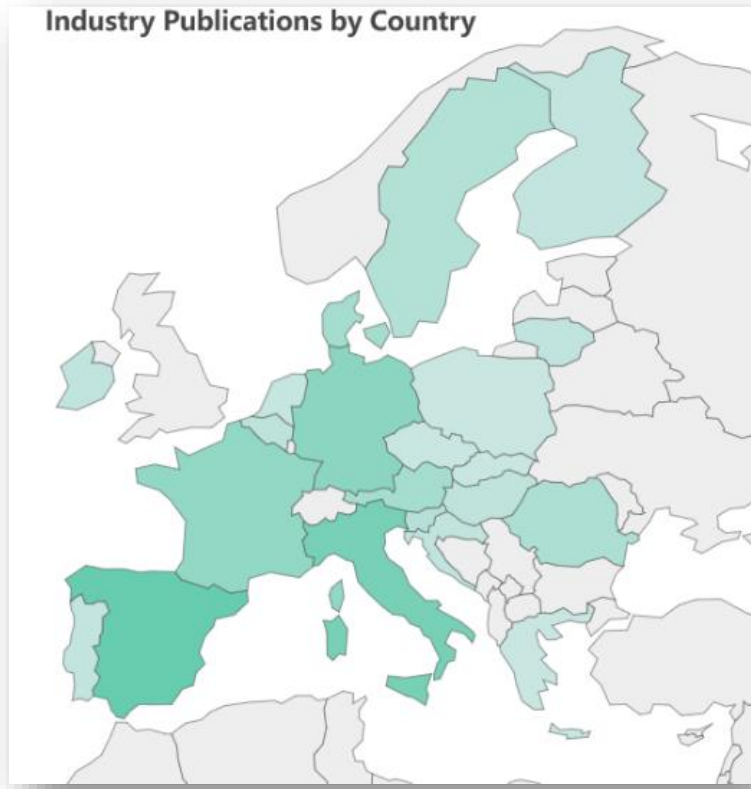
Number of Companies by NACE



ENERGY – EU – INDUSTRY

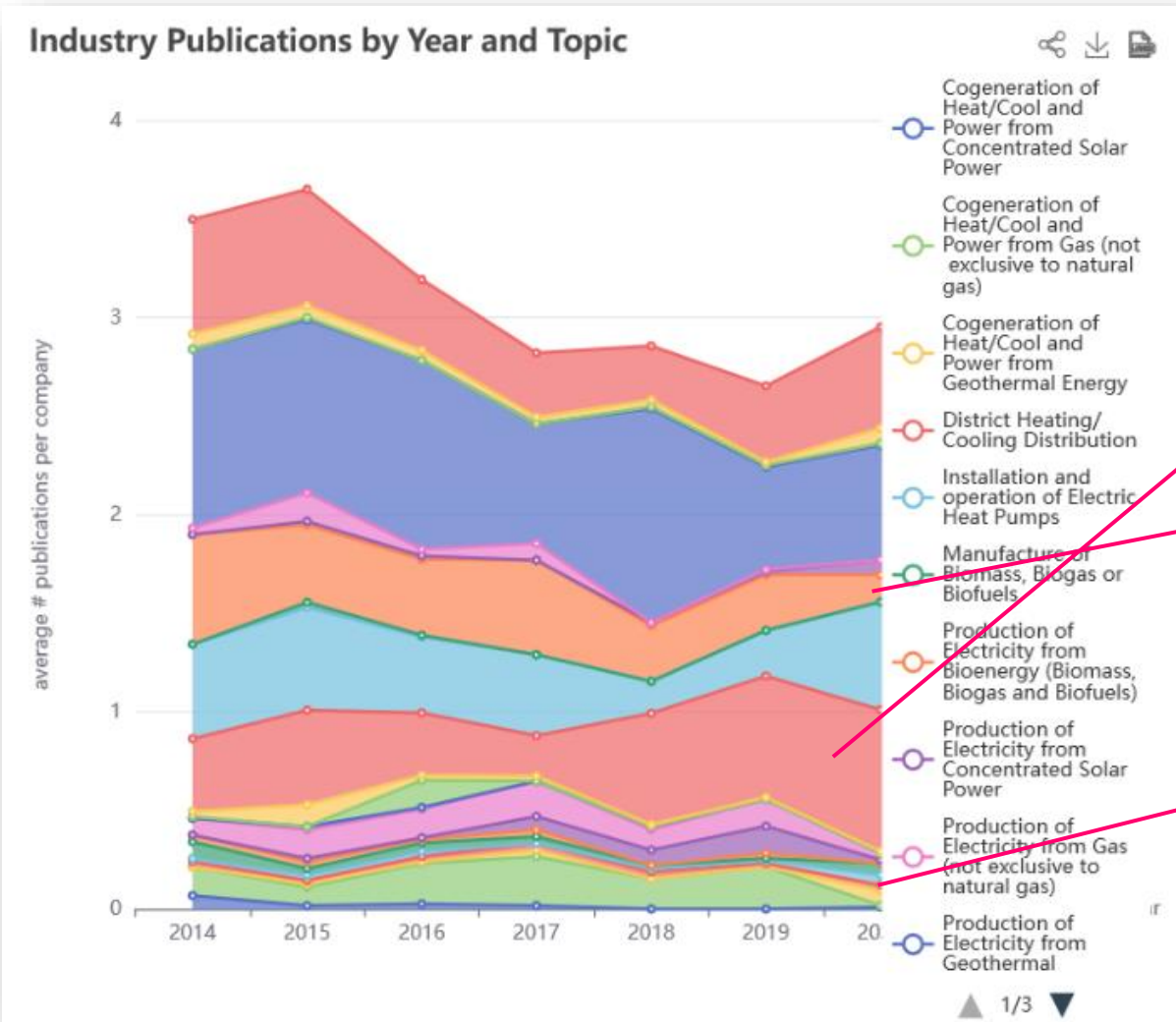
Measuring the Innovativeness of Industry: **patents, publications, and trademarks** distributions across countries

Company innovativeness distributed more evenly
France stands out in patents and trademarks
Germany consistent throughout
Spain leads in Energy-related research by the industry



ENERGY – EU – SCIENTIFIC RESEARCH INDUSTRY VS. ACADEMIA

Bridging Industry and Science: comparative analysis of publication topics



Industrial research (that gets published) **trending** in “production of electricity of solar PV” & Heat Pumps

“production of Heat/Cool from gas combustion” **declining** importance

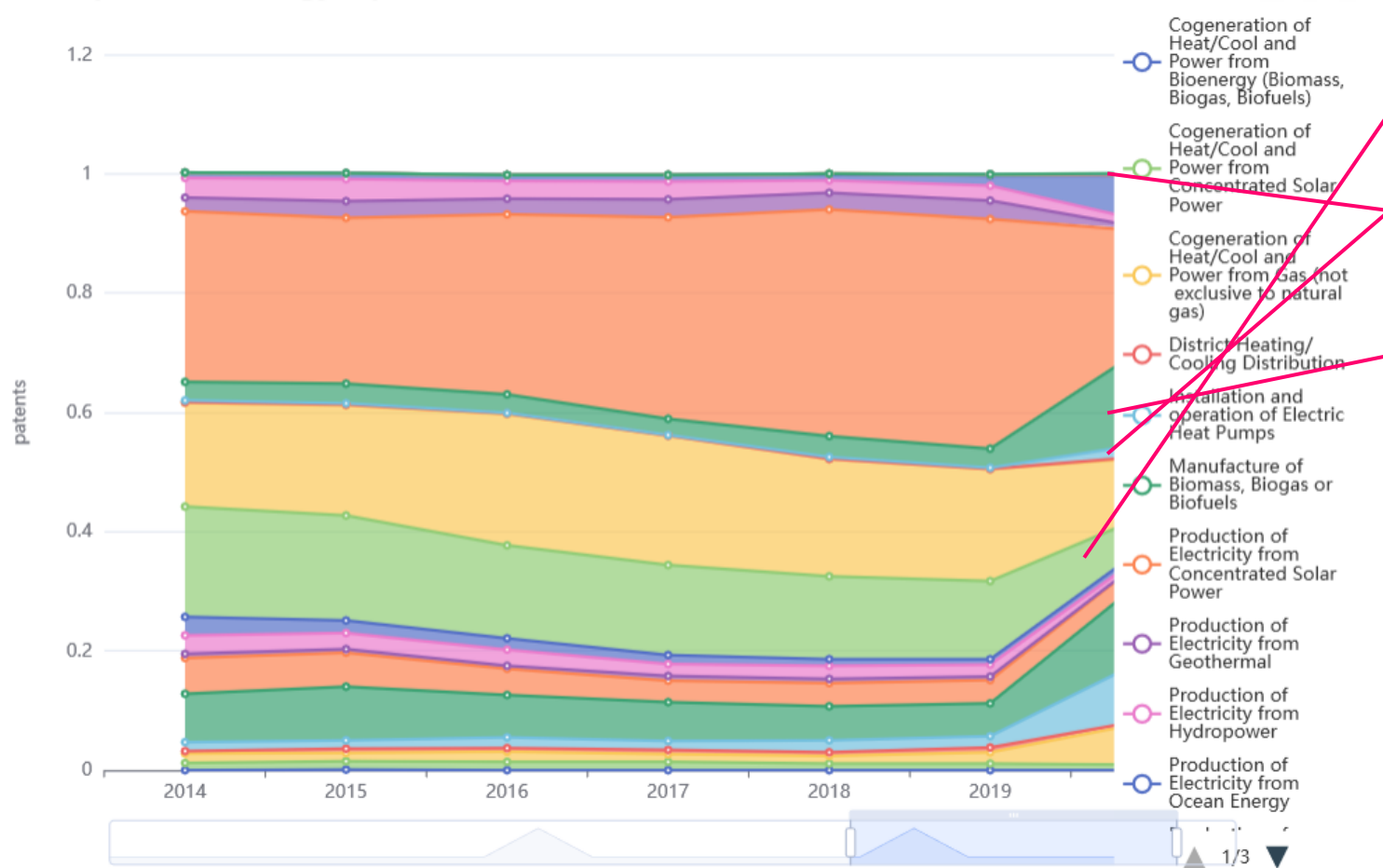
Geothermal energy seems to be **emerging**



ENERGY – EU – PATENTS

Analyzing Divergence: patents vs publication topics in Energy Innovation

Share of patents in Energy topics over time



Comparing patent topic trends tells a different story:

- “production of electricity of solar PV” (decreasing # of patents vs increasing # pubs)

- “production of Heat/Cool from gas combustion” (very little patenting)

- Geothermal energy (no emerging trend)

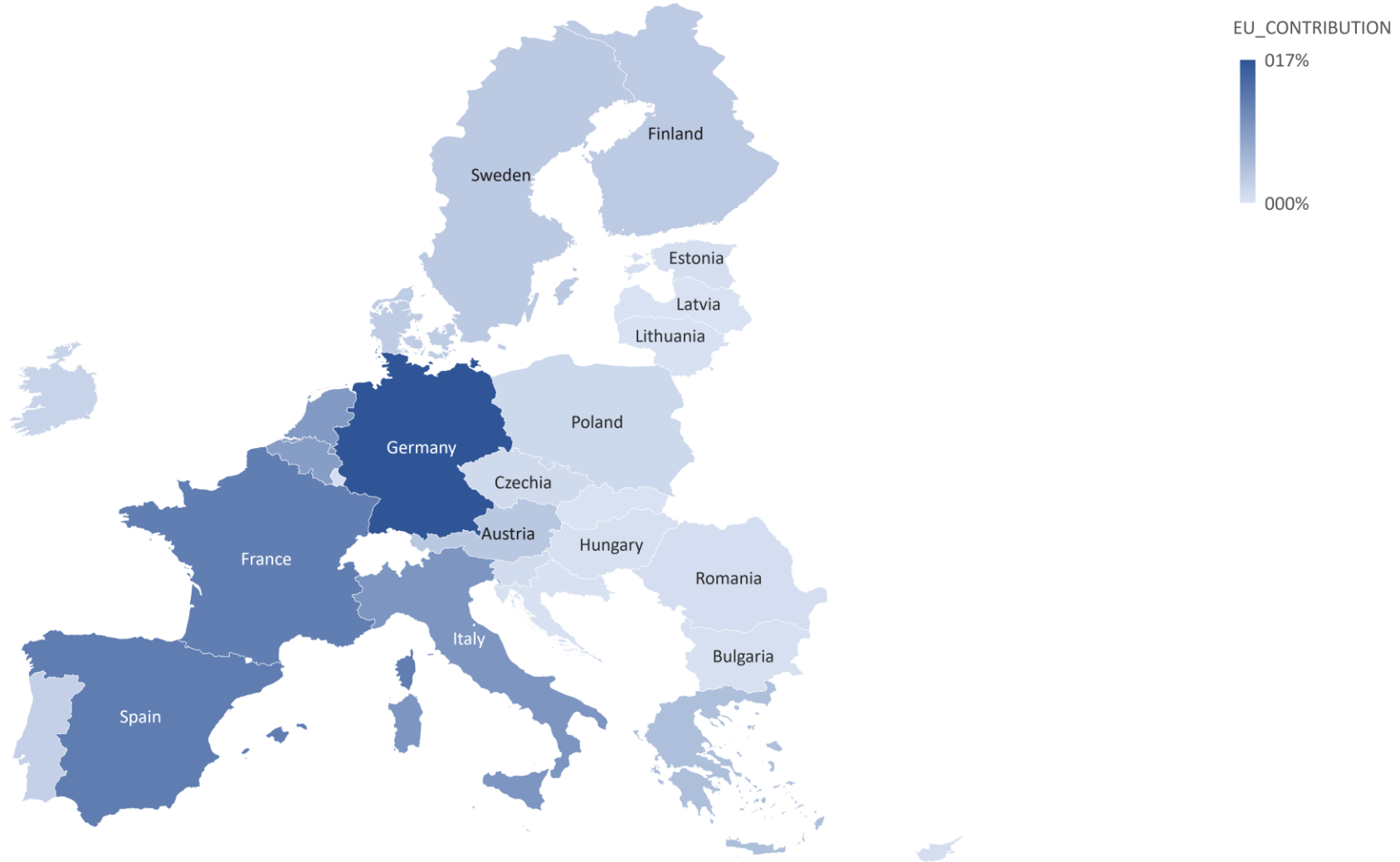
- Emerging patent topic: “production of heat/cool using waste heat”

Patents and publications show different trends as patents capture new technological innovations (e.g., emerging technology in waste heat energy production) along the national plans, while publications may focus more on refining existing technologies and exploring future work.

Horizon Europe – EU contribution based on Energy-Agrifood projects

EU funding per EU27 country in Energy and Agrifood HE projects

Country	EU Funding
Germany	17.41%
Spain	12.52%
France	12.39%
Italy	9.59%
Netherlands	9.12%
Belgium	8.59%
Greece	4.56%
Austria	3.46%
Sweden	3.23%
Finland	3.18%
Denmark	2.95%
Portugal	2.39%
Ireland	2.07%
Poland	1.50%
Czech Republic	1.21%
Slovenia	1.07%
Cyprus	0.74%
Romania	0.70%
Estonia	0.60%
Luxembourg	0.56%
Bulgaria	0.46%
Hungary	0.42%
Lithuania	0.38%
Croatia	0.32%
Slovakia	0.24%
Latvia	0.23%
Malta	0.11%



AGRIFOOD – EU vs GR

SDG-Aligned Technological Insights:
Examining variation in addressing societal priorities in technologically-relevant projects & publications
(Expected vs Actual Impact)

- Greek publications cited in patents, suggest a potential **regional specialization** in 'Climate Action' that could enrich collaborative technological efforts across the EU.
- The EU's tech publication distribution indicate **different and broader technological research interests** that Greece focused expertise might complement, potentially driving joint innovation in targeted SDGs.

Agrifood - EU

Publications cited in patents by SDG



Agrifood - GR



AgriFood - Industry Innovation: Products, Services, Processes, Supply chain

Focus: Greece – Green Transition



Alternative Proteins

Alternative proteins are plant-based and food technology alternatives to animal protein. They include food products made from plants (for example, cereals, pulses and nuts), fungi (mushrooms), algae, insects and even lab-grown meat.

Examples - technologies

➤ <https://www.bioagros.gr> BioAgros participated in the Vegan Awards 2023 and received several awards, including a Platinum award for its Organic Tofu Natural "Tofunistas", a Gold award for its organic crispy rice grains with cocoa "Vitabella" and a Bronze award for its organic wholemeal coconut & chocolate coated wafer "Harmonica." BioAgros is committed to providing high quality organic products that are vegan, taste great and are nutritious.

Multilinguality

Business Areas

Technologies



Renewable Energy

Renewable energy sources such as solar, wind, geothermal and biomass have huge potential for sustainable agricultural practices. Integrating renewable energy into agriculture can reduce dependence on fossil fuels, minimise greenhouse gas emissions and promote a more sustainable and environmentally friendly food production system.

Examples - technologies

➤ <https://www.euphoriasecrets.com/> From solar energy to recycling and the use of eco-friendly packaging bags, our goal is to become a 100% environmentally friendly company within the next few years.



Technologies to reduce water consumption

Technologies that reduce water consumption play a vital role in ensuring sustainable agricultural practices and mitigating the impact of water scarcity on food production. These technologies, such as drip irrigation systems, smart irrigation controllers, drought-resistant crops, ground cover and water harvesting techniques, offer effective strategies for conserving water resources and enhancing crop productivity.

Examples - technologies

➤ <https://ggc.gr/>: GGC is committed to sustainability and uses technology to help its grapes grow and make the environment better. GGC uses an electrostatic sprayer instead of a turbine, installed a weather station with sensors, recycles its materials, and uses the latest drip irrigation technology.

AgriFood - Industry Innovation: Products, Services, Processes, Supply chain

Focus: Greece – Digital Transition



Precision Agriculture

Precision farming is a modern approach to agriculture that uses advanced technologies to optimise resource utilisation and enhance crop productivity. Using tools such as GPS-enabled tractors, drones, sensors and data analytics, precision agriculture allows farmers to monitor and manage their fields with unprecedented accuracy.

Examples - technologies

➤ <https://www.3dsa.gr/>: The company participates in the EXTREMES project, which involves the use of modern equipment, including drones, to support the development of integrated information systems for environmental risk monitoring and disaster prevention in vulnerable Greek agriculture.



Remote Sensing

Remote sensing technologies have transformed agriculture by providing farmers with valuable data about their fields from afar. By analysing images captured by satellites, planes and drones, remote sensing can provide information on crop health, soil conditions, water availability and pest infestations.

Examples - technologies

➤ <https://www.farm.novagreen.gr/>: Novagreen is a company belonging to the Novafarm group of companies. The company has collaborated with the Agricultural University of Volos and the company Ecodevelopment to develop a program that uses remote sensing to improve cherry cultivation.

Examples - technologies

➤ <https://www.easmn.gr/>: Easmn.gr uses traceability techniques to identify olive products through a single Italian-Greek traceability system. It aims to ensure the safety and transparency of the production processes for olive oil and table olives. The system allows consumers to identify the geographical origin of the purchased product using a traceability code placed on the label of the packaging.

Business Areas

Technologies

Traceability and food safety



Traceability and food safety are critical aspects of modern agriculture, ensuring safe food for consumers. Traceability systems track the movement of food from farm to fork, allowing rapid identification and removal of contaminated products. Food safety measures prevent contamination throughout the production process. By implementing effective traceability and food safety systems, the agricultural industry contributes to a safer food supply.

Multilinguality

Energy: Industry Innovation Greece – Digital Transition



Artificial Intelligence

AI can analyse data from sensors and smart meters to identify patterns and predict energy demand. This information can be used to optimise energy consumption by adjusting heating, cooling and lighting systems. It can be used to predict the production of renewable energy sources such as solar and wind power. This information can be used to optimise electricity distribution and to ensure that the grid can accommodate the variability of renewable energy sources.

Examples - technologies

➔ <https://calpak.gr/>: The new Calpak factory is the first in Greece to implement 5G technology with the potential of a smart production unit, as well as artificial intelligence in robotic welding for continuous automatic improvement (welding machine learning).



Internet of Things

Internet of Things (IoT) is revolutionising the energy sector by enabling real-time data collection and analysis from connected devices. This data can be used to optimise energy consumption, improve grid reliability and develop new energy-saving technologies.

Examples - technologies

➔ <https://eunice-group.com/>: The company uses IoT technologies to develop innovative solutions for the generation and management of renewable energy. The company's S4S system is a digital platform that can be used to manage the production, storage and consumption of renewable energy. The company also develops SMART HOME DEVICES that can be used to control and manage energy consumption in homes and businesses. These devices use IoT technology to collect data on energy consumption and provide real-time feedback to users.

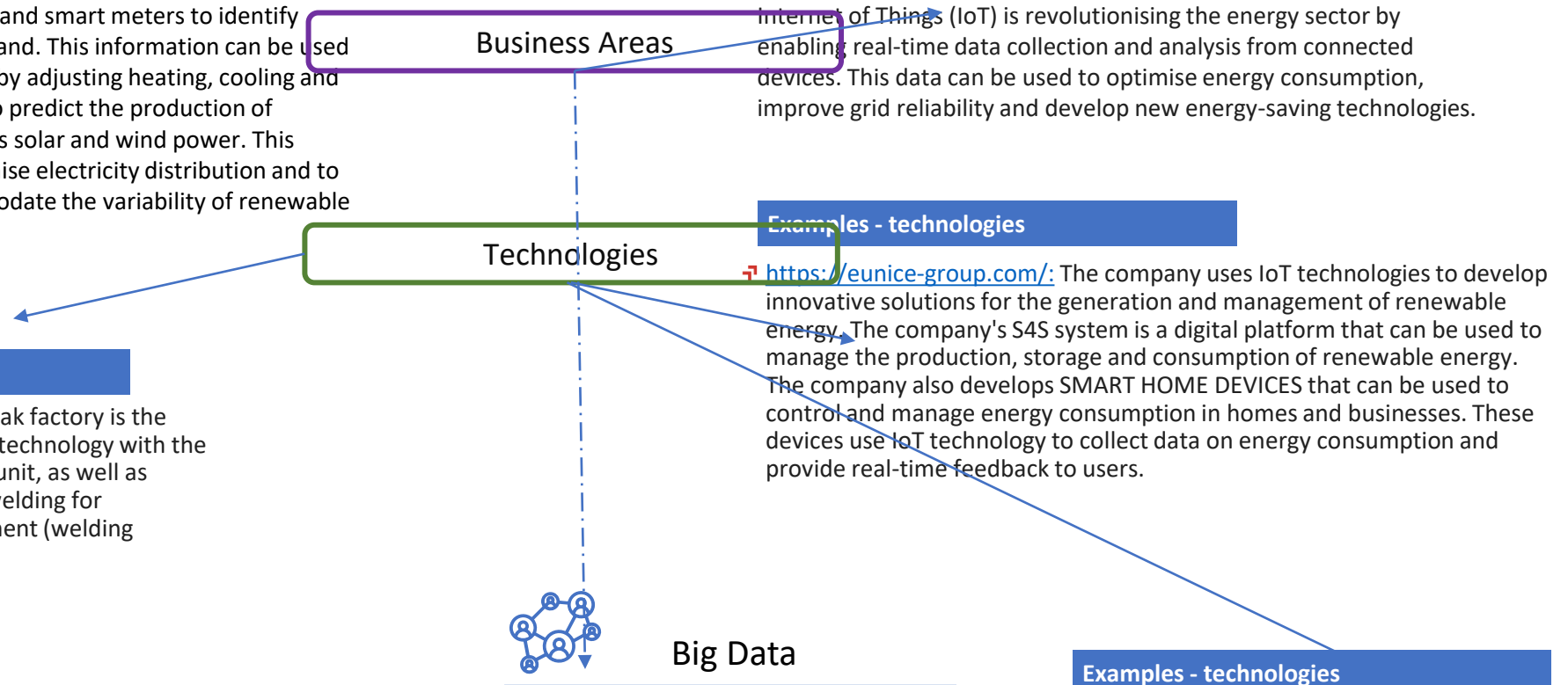


Big Data

The vast amount of data generated from various sources is revolutionising the energy sector by providing information on energy consumption patterns, grid stability and renewable energy potential. For example, energy companies can analyze big data from smart meters to identify patterns in energy consumption in residential and commercial installations.

Examples - technologies

➔ <https://www.enelgreenpower.com/>: ENELGREEN is constantly researching and developing innovative solutions to make green energy production safer, more efficient and sustainable. Digital transformation projects - robotization, automation and big data - are improving the use of renewable resources while testing new business solutions.



Energy: Industry Innovation **Greece – Green Transition**



Production of electricity from wind power

Wind power, a clean and renewable energy source, harnesses the kinetic energy of the wind to generate electricity. Wind turbines, tall frames with propeller-like blades, collect wind energy and convert it into rotational energy. This rotational energy is then transferred to a generator, which produces electricity. Wind power is a flexible and sustainable energy source that can help reduce dependence on fossil fuels and tackle climate change.

Examples - technologies

↗ <https://pindosenergy.gr/>: Pindos Energy S.A. is a company that develops and operates renewable energy projects, including wind farms. The company was founded in 1998 and has long experience in the wind energy sector. Pindos Energy SA has a portfolio of wind farms in Greece and the Balkans. The company is committed to using wind energy to help its customers make the transition to a more sustainable future.



Production of electricity from Solar PV

The electricity produced by solar photovoltaic panels can be used to power homes and businesses or fed into the grid. Solar PV is a clean, renewable and sustainable energy source that can help reduce dependence on fossil fuels and address climate change.

Examples - technologies

↗ <https://www.bigsolar.gr/>: Bigsolar is a company that uses solar energy to generate electricity. The company provides a variety of solar energy solutions, including solar panels, inverters and storage systems. Bigsolar also offers a variety of services, including installation, maintenance and monitoring. The company is committed to providing its customers with clean, reliable and affordable solar energy solutions.

Technologies



Storage of hydrogen

The storage of hydrogen, an abundant and flexible energy carrier, is a critical issue for its widespread adoption as a clean and sustainable energy source. A variety of hydrogen storage methods have been developed to address the challenges posed by its low volumetric energy density and its tendency to leak. Hydrogen storage in compressed, liquid or solid form offers different advantages and disadvantages, with the choice of the appropriate method depending on the specific application.

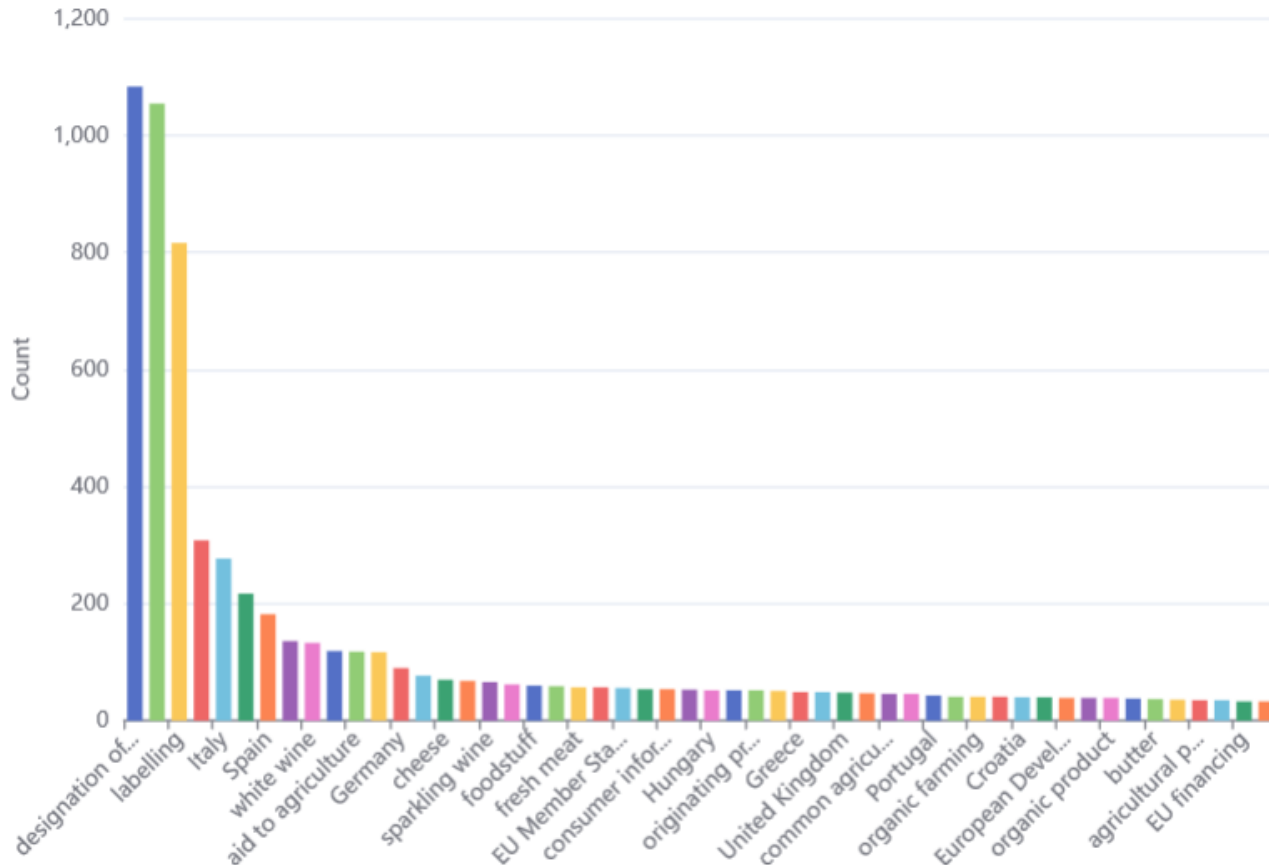
Examples - technologies

↗ <https://eunice-group.com/>: The project aims to create a reversible solid oxide power balancing plant (rSOC) that can generate electricity from hydrogen and store the excess electricity in the form of hydrogen.

AGRIFOOD – EU REGULATIONS

Navigating Agrifood Regulations: key focus areas and regional emphasis

Distribution of Regulations by Topic



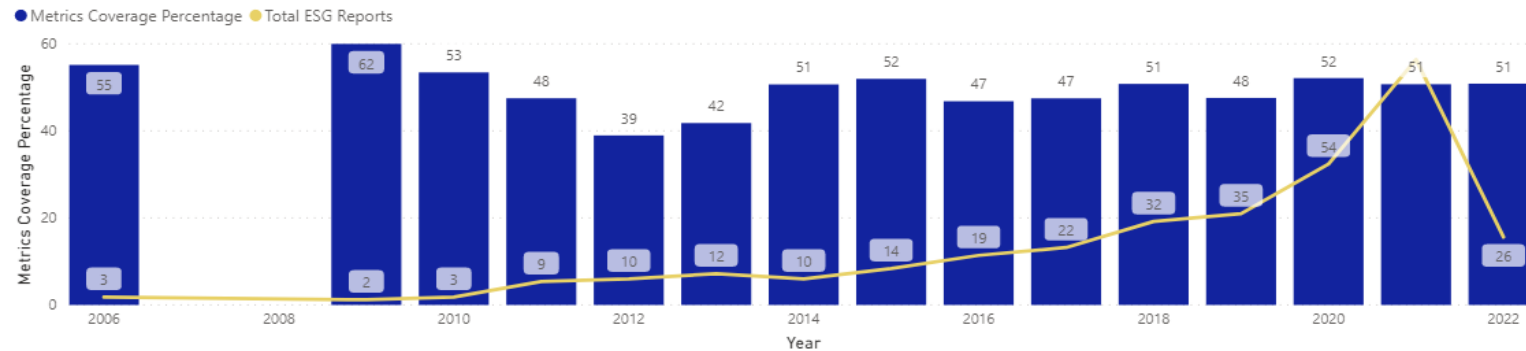
- Most regulations encompass designation of origin (1083), **product designation** (1054), and **labeling standards** (816) for geographical identity, product integrity, and consumer information.
- Multiple regulations for **production locations** (308) maintain product quality and regional authenticity.
- **Country-Specific Emphasis:** Italy (277), France (217), and Spain (182) have distinct regulations reflecting their importance in agrifood.
- **Specialized Focus:** Wine (white: 133, red: 119, rosé: 77), cheese (70), and olive oil (68) have stringent quality controls.
- **Financial Support:** Regulations for agricultural expenditure (59) and aid (118) support the sector.

• ***What about environmental protection technological regulations –legislation need to catch up with tech/STI developments.***

ESG Analytics: Metrics Coverage Evolution

Energy

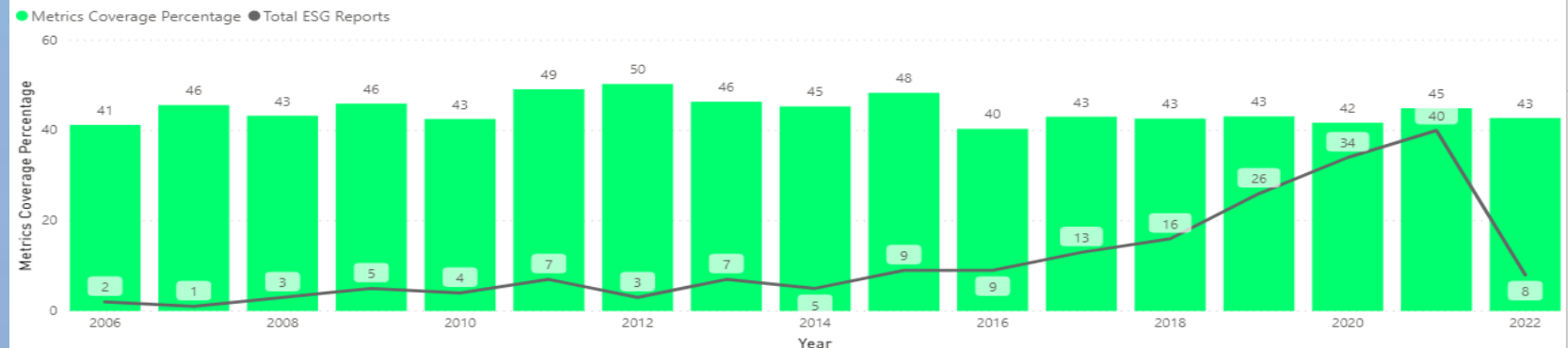
Metrics Coverage Percentage and Total ESG Reports by Year



- Increasing number of ESG Reports along years.
- From 2018 the increase rate is much higher, while the Metrics Coverage remains stable.

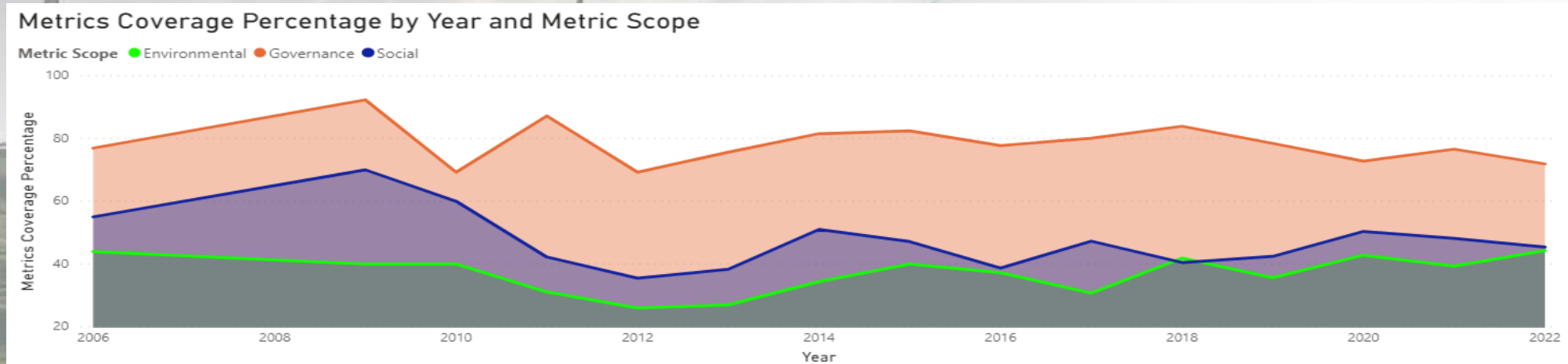
Agrifood

Metrics Coverage Percentage and Total ESG Reports by Year

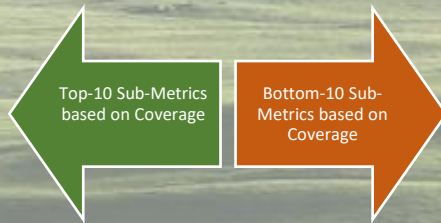


- Similar tendencies to Energy, with slightly lower levels.

ESG: Metrics Coverage Analysis (Energy Sector)



Sub-Metric Title	Metrics Coverage Percentage	Metric Scope
Description of sustainability policy	100	Governance
Description of systems, processes and mechanisms to identify and mitigate critical risks	100	Governance
Discussion of long and short term strategies in relation to the management, mitigation, performance targets of its emissions	100	Environmental
Description of approach to sustainability oversight	100	Governance
Description of business ethics policy and fundamental principles	100	Governance
Description of human rights policy and fundamental principles	99	Social
Description of the impact of business operations on biodiversity sensitive areas	99	Environmental
Description of data security policy and fundamental principles	95	Governance
Disclosure of performance targets associated with strategic Environmental objectives	90	Governance
Total amount of monetary losses as a result of legal proceedings associated with data security and privacy	85	Social



Sub-Metric Title	Metrics Coverage Percentage	Metric Scope
Percentage of electricity consumed	21	Environmental
Total amount of monetary expenditure on employee training	20	Social
Percentage of water recycled	19	Environmental
Difference between between male and female earnings	17	Social
Total amount of Nox (excluding N2O) emitted	12	Environmental
(Top 10% Seniority) Average hours of training that the organisation's employees have undertaken during the reporting period	11	Social
Ratio of CEO to median employee earnings	11	Social
Total amount of Volatile organic compounds (VOCs) emitted	9	Environmental
Total amount of Sox emitted	8	Environmental
Total amount of Particulate matter (PM) emitted	7	Environmental

ESG: Insights about key Governance Indicators (Sector Comparison)

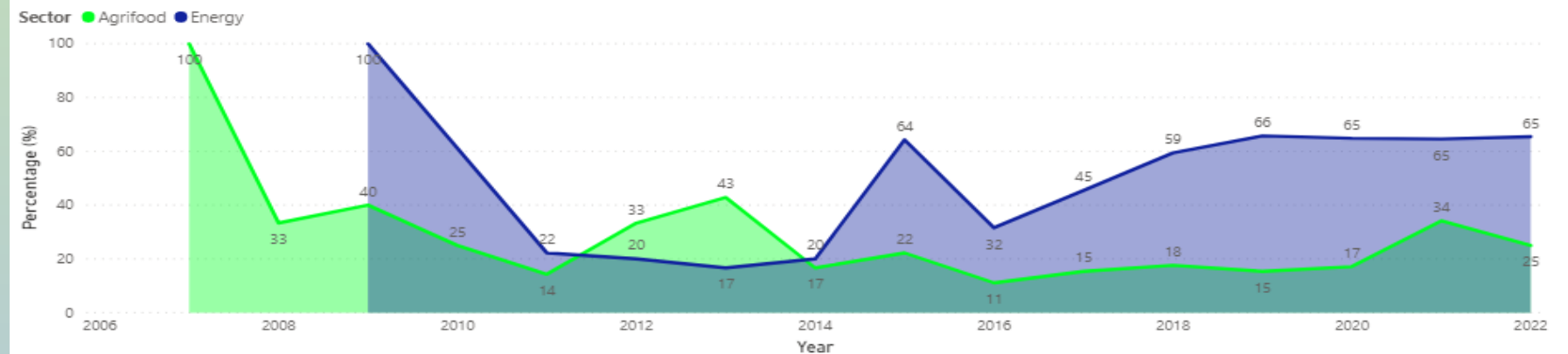


The percentage of energy companies having data privacy policy is much higher than the Agrifood ones after 2014, scaling to more than 50% after 2018.

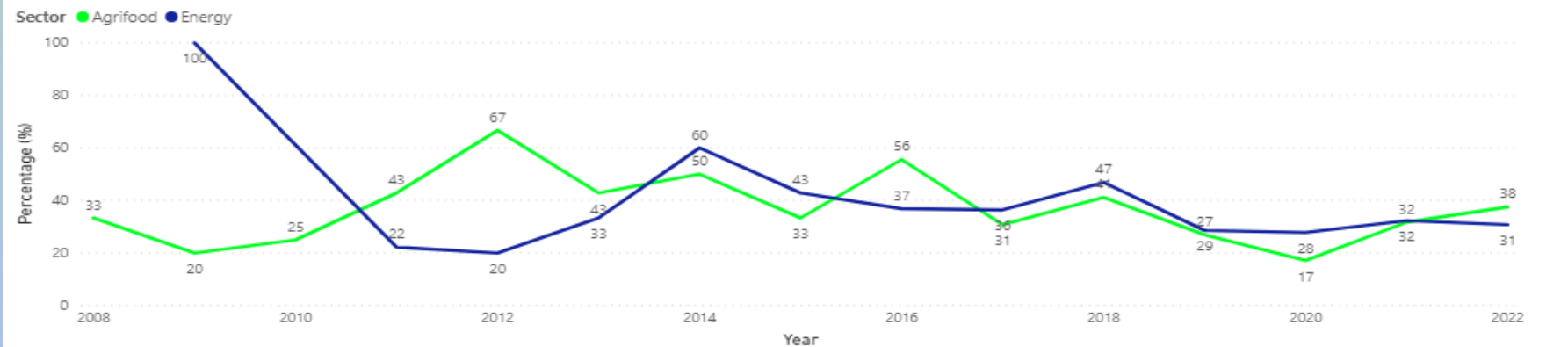


The percentage of companies having external assurance for their ESG reports is decreasing after 2017-2018. ESG reporting becomes more common, and companies may even have specialized compliance units for this kind of reports. Consequently, seek for external assurance by external reporting or auditing companies decreases.

Percentage of Companies with Data Security Policy per Sector by Year



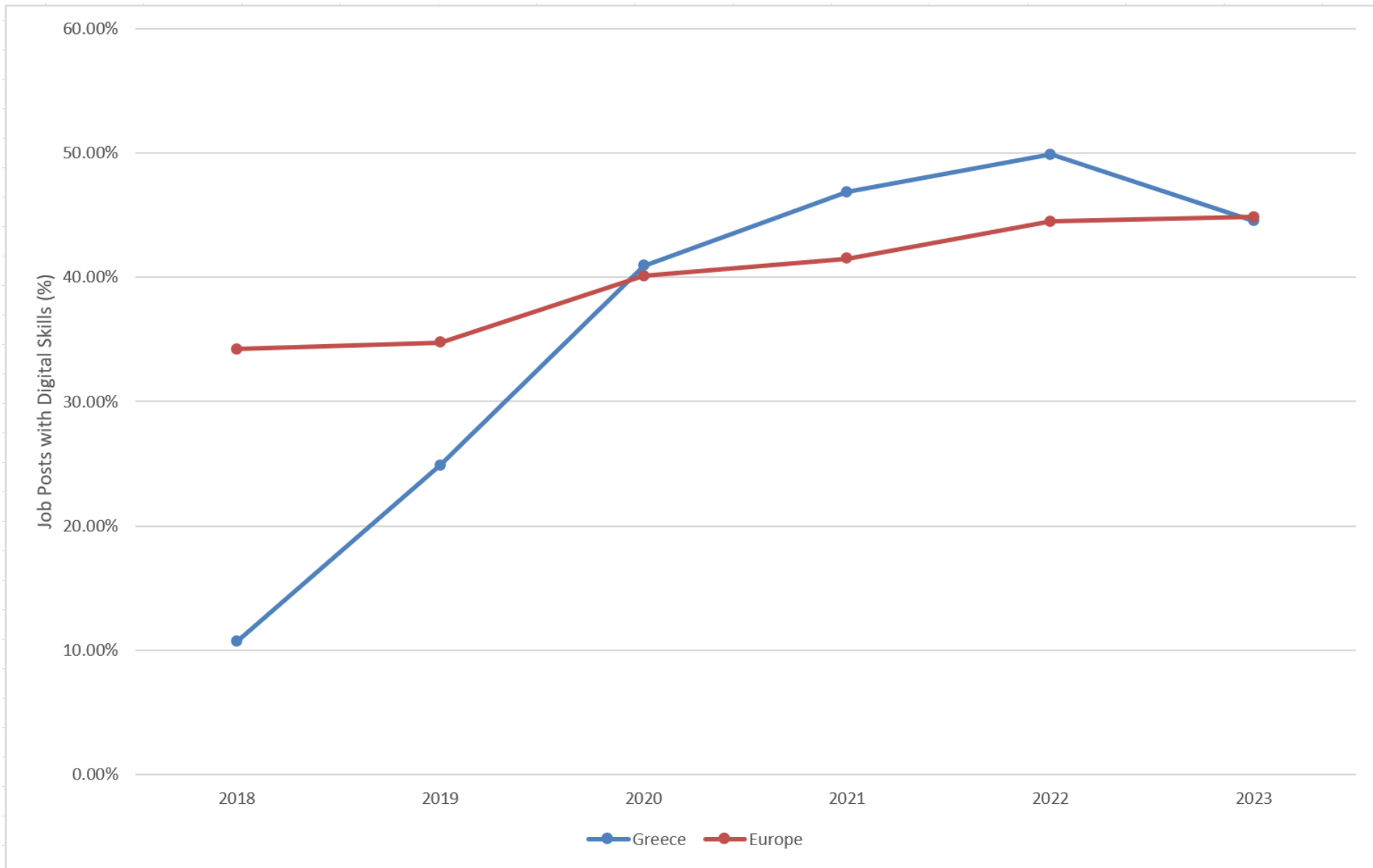
Percentage of Companies with External Assurance on their ESG Reports per Sector by Year



Digital Transitioning: Job Posts – Stats

Country	Job Posts						Job Posts with Digital Skills						Sum of Job Posts	Sum of Job Posts with Digital Skills
	2018	2019	2020	2021	2022	2023	2018	2019	2020	2021	2022	2023		
🇧🇪 Belgium	469,159	1,056,649	850,453	1,214,630	1,574,476	1,263,518	176,683	340,576	350,894	555,341	713,189	559,998	6,428,885	2,696,681
🇨🇪 Czech Republic	103,884	431,358	208,284	279,690	564,010	440,775	38,089	107,034	68,715	87,454	262,637	222,533	2,028,001	786,462
🇩🇰 Denmark	7,462	66,637	37,067	70,496	109,359	182,478	3,120	30,277	16,854	26,234	54,265	101,479	473,499	232,229
🇩🇪 Germany	4,121,830	8,802,735	6,646,750	6,651,278	6,460,748	5,225,575	1,725,584	3,742,180	3,104,696	3,353,746	3,365,679	2,760,513	37,908,916	18,052,398
🇪🇺 Estonia	4,224	36,025	34,001	58,396	57,859	28,355	991	10,527	8,007	13,146	14,222	5,192	218,860	52,085
🇮🇪 Republic of Ireland	142,955	352,877	322,848	314,475	428,500	340,983	108,555	254,732	252,057	221,904	311,757	243,377	1,902,638	1,392,382
🇪🇸 Spain	429,407	1,219,314	568,763	679,567	724,064	632,158	146,083	411,976	207,580	279,058	307,899	251,744	4,253,273	1,604,340
🇫🇷 France	3,003,009	6,146,831	6,199,487	7,412,088	9,950,404	10,919,912	1,007,611	1,866,990	2,336,075	3,322,787	4,509,716	4,926,135	43,631,731	17,969,314
🇦🇹 Croatia	6,470	57,797	72,441	131,979	160,532	160,495	1,154	16,026	23,859	31,615	57,026	65,808	589,714	195,488
🇮🇹 Italy	706,321	1,993,140	2,465,982	1,569,544	1,900,355	1,629,552	285,999	900,008	1,229,113	735,290	908,042	738,911	10,264,894	4,797,363
🇱🇻 Latvia	4,048	40,481	38,378	66,550	90,035	78,142	1,361	14,634	11,726	15,205	21,341	16,499	317,634	80,766
🇱🇹 Lithuania	9,294	78,860	93,214	134,282	160,809	127,760	3,196	37,680	34,124	35,617	48,585	43,531	604,219	202,733
🇱🇺 Luxembourg	17,666	46,163	18,050	15,613	17,219	24,522	11,246	28,751	11,075	9,020	8,914	11,209	139,233	80,215
🇭🇺 Hungary	14,440	148,172	112,647	293,568	242,623	237,594	4,747	41,927	34,623	116,059	88,046	92,916	1,049,044	378,318
🇲🇹 Malta	5,551	7,956	5,255	11,532	16,548	12,871	3,013	4,420	2,871	6,716	10,646	6,921	59,713	34,587
🇳🇱 Netherlands	878,174	1,552,783	1,684,304	1,743,047	1,867,583	1,702,867	363,710	560,665	796,863	786,453	878,884	775,709	9,428,758	4,162,284
🇦🇺 Austria	431,176	804,962	643,345	516,597	430,618	289,895	141,595	320,875	351,419	286,666	236,680	148,275	3,116,593	1,485,510
🇵🇱 Poland	351,632	920,209	1,226,068	1,157,072	2,008,263	1,563,807	90,205	223,356	455,459	522,676	1,136,477	928,417	7,227,051	3,356,590
🇵🇹 Portugal	82,317	199,850	176,823	405,370	407,208	425,578	21,335	59,245	80,985	212,967	214,061	231,512	1,697,146	820,105
🇷🇴 Romania	35,441	266,577	157,395	237,338	327,506	349,224	17,356	116,730	64,551	66,515	141,355	267,435	1,373,481	673,942
🇸🇮 Slovenia	1,195	41,207	45,083	49,118	72,334	79,568	27	5,175	6,450	3,923	7,081	11,030	288,505	33,686
🇸🇰 Slovakia	34,868	172,694	120,277	160,173	180,731	269,253	16,815	64,049	47,355	71,452	82,625	122,225	937,996	404,521
🇫🇮 Finland	21,341	135,615	62,080	64,705	63,806	96,898	4,436	21,536	12,829	9,335	13,038	17,101	444,445	78,275
🇸🇪 Sweden	279,785	585,812	632,947	1,173,109	1,761,263	1,189,618	81,052	184,363	285,726	482,295	786,469	552,237	5,622,534	2,372,142
🇬🇧 United Kingdom	4,605,801	8,011,242	8,596,366	6,002,530	8,503,609	6,255,827	3,248,144	5,418,111	6,228,313	4,122,872	6,327,577	4,640,796	41,975,375	29,985,813
🇬🇷 Greece	3,598	43,032	48,536	55,679	76,384	97,359	323	10,232	20,563	26,872	36,363	41,866	324,588	136,219
🇨🇾 Cyprus	3,414	19,925	10,749	14,827	26,509	44,789	1,370	8,098	5,625	7,065	12,373	17,531	120,213	52,062
🇧🇬 Bulgaria	30,317	146,226	149,646	156,628	122,728	105,102	16,116	59,112	51,686	100,866	61,941	51,426	710,647	341,147
📊 Sum	15,804,779	33,385,129	31,227,239	30,639,881	38,306,083	33,774,475	7,519,916	14,859,285	16,100,093	15,509,149	20,616,888	17,852,326	183,137,586	92,457,657

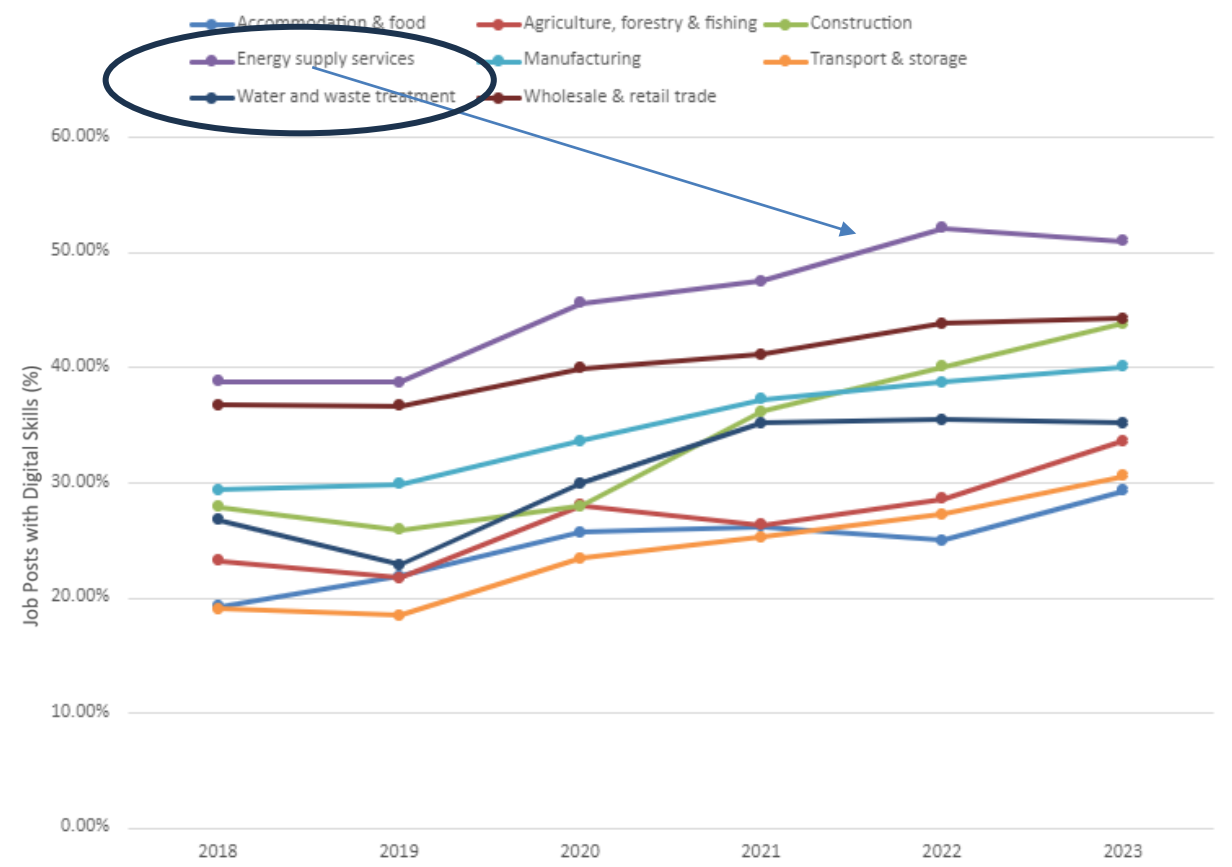
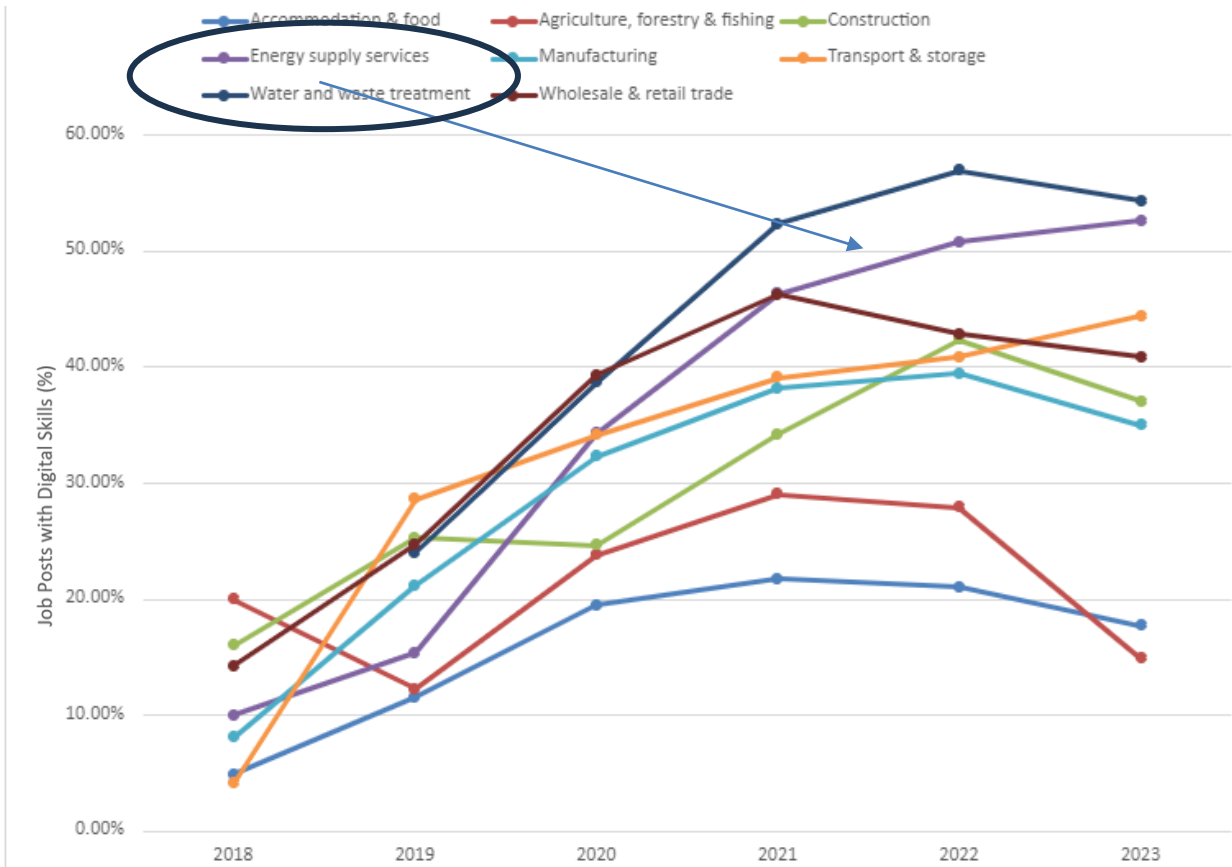
Digital Transitioning: Job Offer with digital skills



Digital Transitioning: Job Offer with digital skills (per sector)

Greece

Europe



Most wanted Digital Skills in Europe

Energy supply services

Skill	Rank in Greece	Sum of Job Posts
use microsoft office	1	437188
office software	5	344854
database	4	141030
computer programming	2	131290
technical drawings	21	127145

Agriculture, forestry & fishing

Skill	Rank in Greece	Sum of Job Posts
use microsoft office	4	64396
office software	7	40251
computer programming	15	20452
business ICT systems	11	19381
database	10	13612

Transport & storage

Skill	Rank in Greece	Sum of Job Posts
use microsoft office	1	941065
office software	2	505800
develop animations	-	266351
database	8	148579
business ICT systems	3	147899

Water and waste treatment

Skill	Rank in Greece	Sum of Job Posts
use microsoft office	1	107482
office software	2	81894
database	5	30091
technical drawings	43	22893
develop animations	-	22075

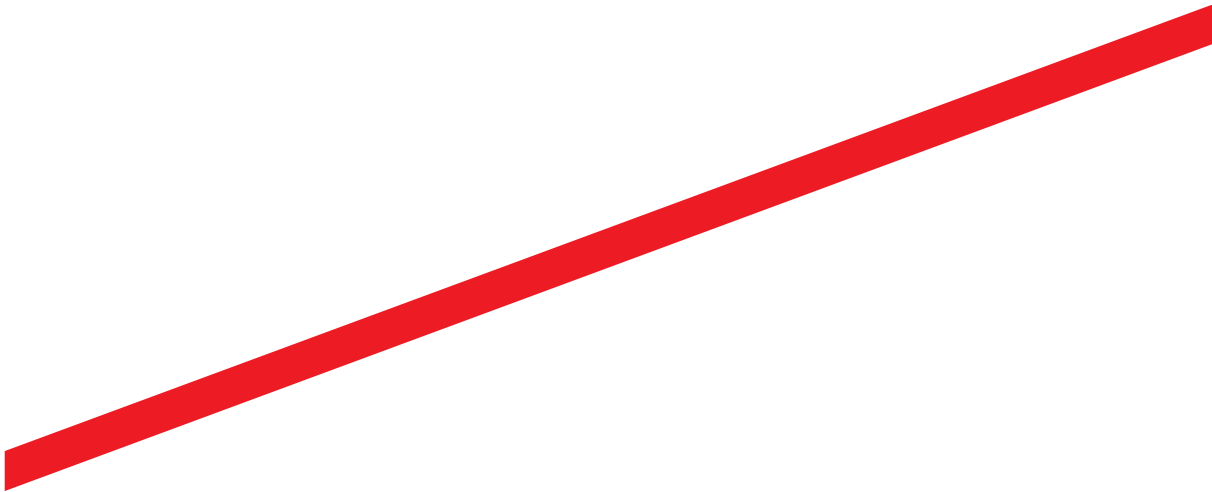
Manufacturing

Skill	Rank in Greece	Sum of Job Posts
use microsoft office	1	4698100
office software	3	2381518
develop animations	-	1561366
technical drawings	21	1497994
computer programming	2	1327852

Construction

Skill	Rank in Greece	Sum of Job Posts
use microsoft office	1	811441
office software	6	496099
create cadastral maps	7	488626
technical drawings	19	242814
develop animations	-	240404

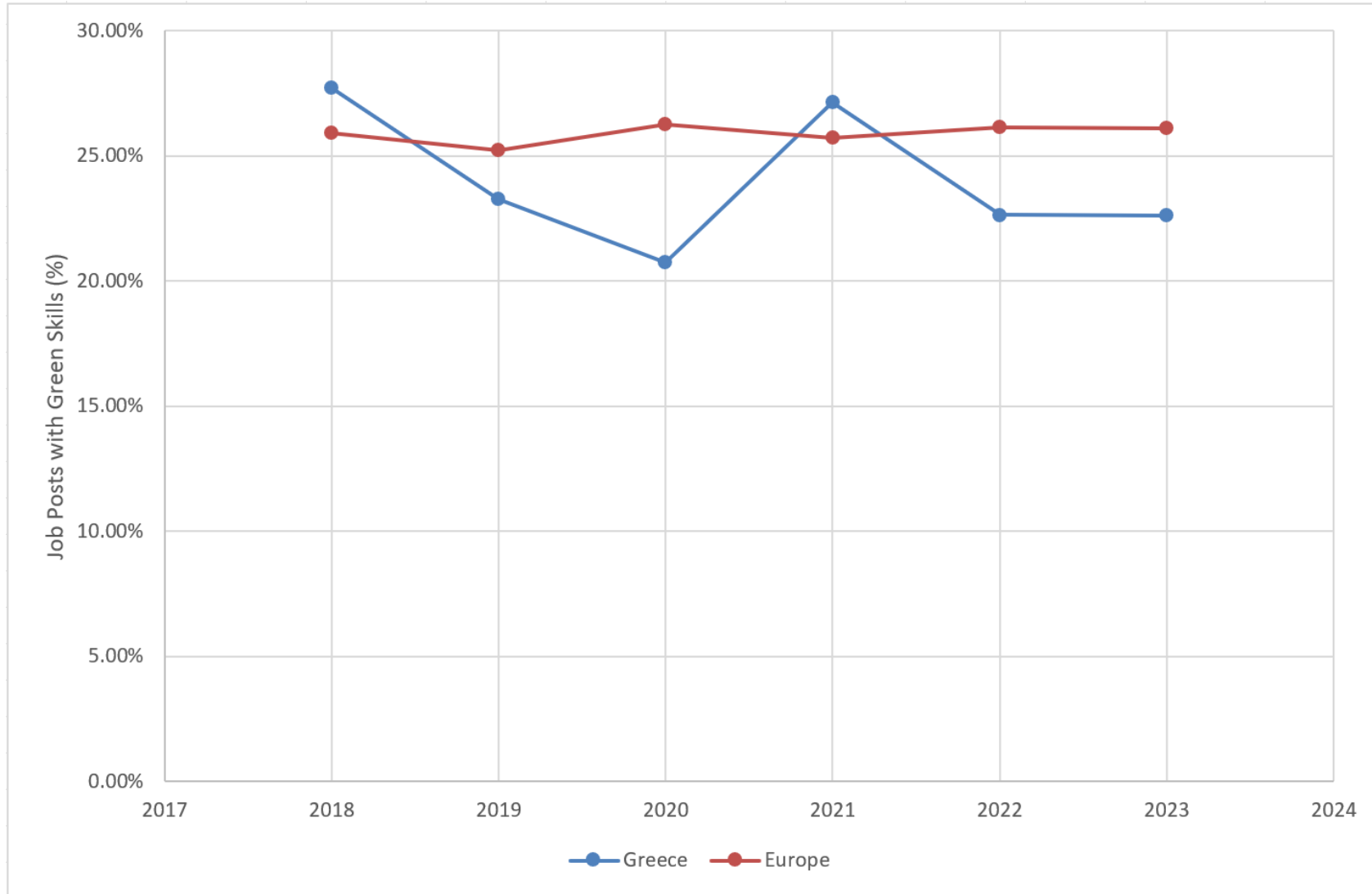
Green Transitioning: Job Offer and skills



Job Posts – Stats – Green Skills

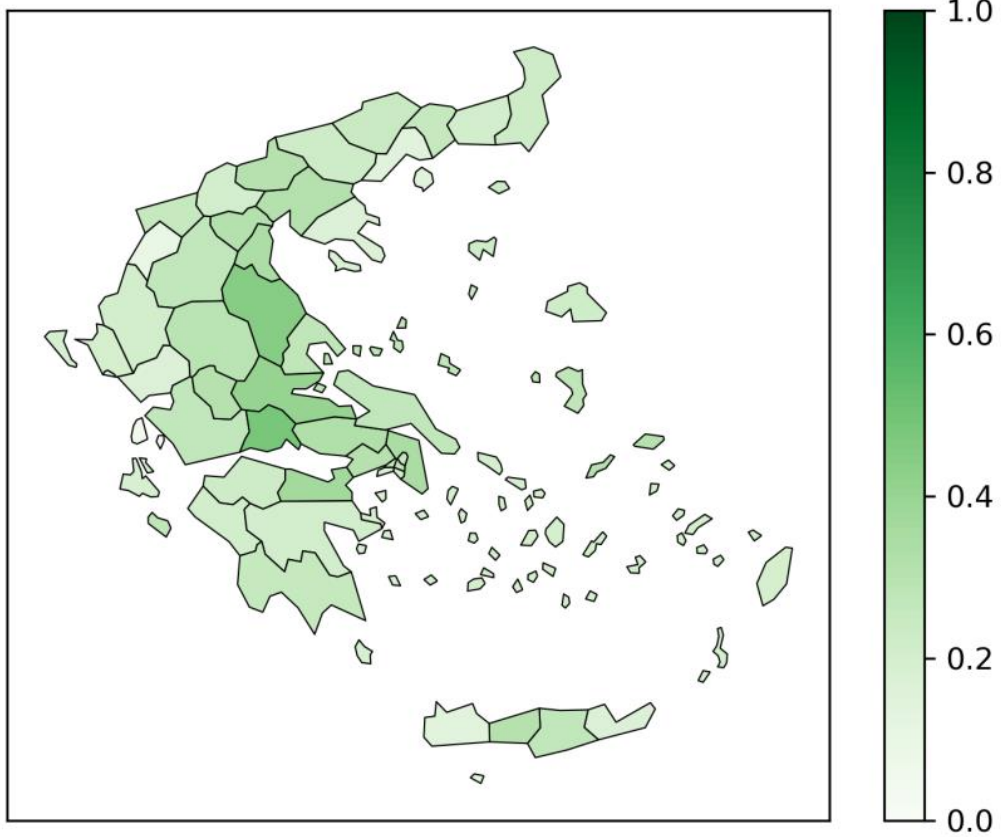
Country	Job Posts						Job Posts with Green Skills						Sum of Job Posts	Sum of Job Posts with Green Skills
	2018	2019	2020	2021	2022	2023	2018	2019	2020	2021	2022	2023		
🇧🇪 Belgium	469,159	1,050,049	850,455	1,214,050	1,574,478	1,205,518	145,515	515,781	202,947	348,050	450,595	570,004	6,428,885	1,903,690
🇨🇪 Czech Republic	103,884	431,358	208,284	279,690	564,010	440,775	26,869	102,987	52,414	71,095	143,322	112,287	2,028,001	508,974
🇩🇰 Denmark	7,462	66,645	37,069	70,497	109,359	182,478	1,881	16,521	8,284	15,750	24,855	45,537	473,510	112,828
🇩🇪 Germany	4,121,830	8,802,735	6,646,750	6,651,278	6,460,748	5,225,575	1,065,365	2,179,453	1,704,661	1,691,954	1,564,487	1,278,335	37,908,916	9,484,255
🇪🇺 Estonia	4,213	36,027	34,001	58,396	57,859	28,375	829	7,484	6,552	13,811	13,222	6,226	218,871	48,124
🇮🇪 Republic of Ireland	142,955	352,877	322,848	314,475	428,500	340,983	42,798	108,325	112,094	100,004	140,759	108,308	1,902,638	612,288
🇪🇸 Spain	429,407	1,219,314	568,763	679,567	724,064	632,158	110,162	302,304	156,603	178,264	175,423	146,540	4,253,273	1,069,296
🇫🇷 France	3,003,009	6,146,831	6,199,487	7,412,088	9,950,404	10,919,912	875,283	1,586,246	1,617,884	1,893,053	2,592,407	2,811,448	43,631,731	11,376,321
🇦🇹 Croatia	6,478	57,864	72,441	131,979	160,532	160,495	1,465	9,444	11,896	21,569	28,416	27,841	589,789	100,631
🇮🇹 Italy	706,321	1,993,140	2,465,982	1,569,544	1,900,355	1,629,552	173,293	500,476	660,726	394,411	450,894	376,771	10,264,894	2,556,571
🇱🇻 Latvia	4,048	40,481	38,378	66,550	90,035	78,142	956	8,968	8,500	13,847	18,006	15,207	317,634	65,484
🇱🇹 Lithuania	9,294	78,860	93,214	134,282	160,809	127,760	2,507	23,063	27,665	37,256	44,896	38,265	604,219	173,652
🇱🇺 Luxembourg	17,658	46,163	18,050	15,613	17,219	24,522	4,846	12,148	4,822	4,343	5,046	6,481	139,225	37,686
🇭🇺 Hungary	14,443	148,183	112,643	293,568	242,602	237,594	3,419	33,514	23,765	66,825	54,909	56,913	1,049,033	239,345
🇲🇹 Malta	5,551	7,950	5,255	11,524	16,548	12,862	900	1,347	1,082	2,123	3,323	2,491	59,690	11,266
🇳🇱 Netherlands	878,174	1,552,783	1,684,304	1,743,047	1,867,583	1,702,867	281,067	491,083	572,601	525,801	584,393	566,299	9,428,758	3,021,244
🇦🇺 Austria	431,176	804,962	643,345	516,597	430,618	289,895	93,432	177,803	155,390	108,862	91,935	64,403	3,116,593	691,825
🇵🇱 Poland	351,632	920,219	1,226,068	1,157,072	2,008,263	1,563,807	78,347	203,902	298,735	272,610	530,606	367,636	7,227,061	1,751,836
🇵🇹 Portugal	82,317	199,850	176,823	405,370	407,208	425,578	20,078	47,680	49,088	101,041	100,625	103,204	1,697,146	421,716
🇷🇴 Romania	35,441	266,577	157,395	237,338	327,497	349,224	9,901	62,242	38,710	41,062	48,387	50,310	1,373,472	250,612
🇸🇮 Slovenia	1,427	41,210	45,099	49,131	72,334	79,568	306	6,391	7,670	8,485	11,487	11,833	288,769	46,172
🇸🇰 Slovakia	34,868	172,694	120,277	160,173	180,731	269,253	7,079	34,218	21,887	28,759	31,993	51,340	937,996	175,276
🇫🇮 Finland	21,341	135,615	62,080	64,705	63,806	96,898	5,043	30,244	12,342	14,441	15,847	20,146	444,445	98,063
🇸🇪 Sweden	279,787	585,812	632,947	1,173,109	1,761,263	1,189,618	48,757	105,225	116,297	209,974	329,544	215,604	5,622,536	1,025,401
🇬🇧 United Kingdom	4,605,801	8,011,242	8,596,366	6,002,530	8,503,609	6,255,827	1,343,459	2,275,873	2,613,573	1,688,051	2,373,469	1,774,143	41,975,375	12,068,568
🇬🇷 Greece	3,617	43,035	48,536	55,681	76,384	97,359	520	6,575	9,524	11,291	14,496	18,137	324,612	60,543
🇨🇾 Cyprus	5,414	19,925	10,749	14,020	20,509	44,709	714	5,715	2,055	2,944	6,152	10,809	120,214	26,447
🇧🇬 Bulgaria	30,317	146,226	149,646	156,628	122,728	105,102	7,500	34,334	33,371	35,930	31,597	26,281	710,647	169,013
📊 Sum	15,805,024	33,385,227	31,227,253	30,639,890	38,306,053	33,774,486	4,352,089	8,685,346	8,591,136	7,902,206	9,886,891	8,689,459	183,137,933	48,107,127

Job Offer and Green Skills



Green Skills – Geographical Distribution

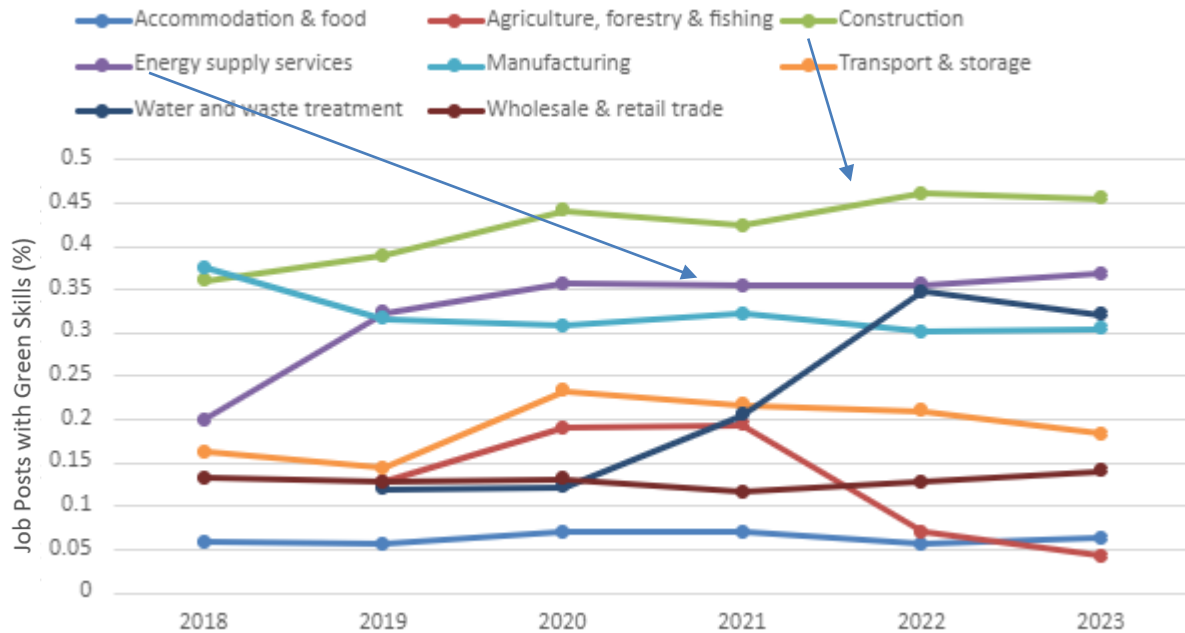
2023



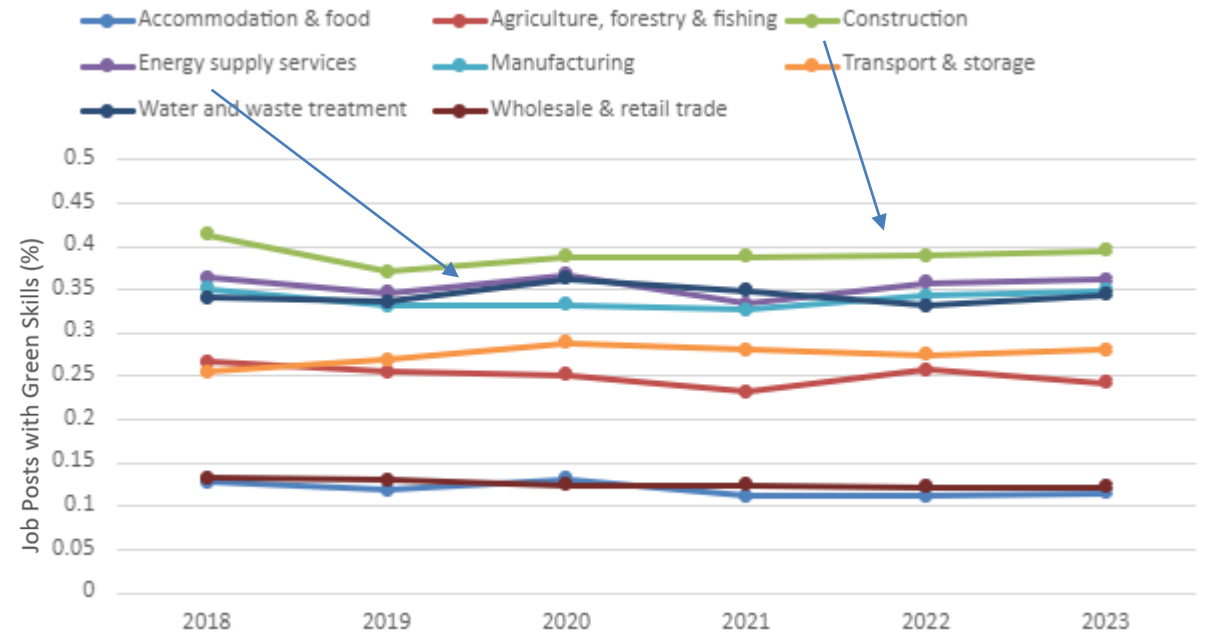
NUTS3 Region	Percentage
Φωκίδα (Phocis)	48.41%
Λάρισα (Larissa)	44.04%
Φθιώτιδα (Fthiotida)	40.50%
Κορινθία (Corinthia)	36.51%
Ανατολική Αττική (East Attica)	34.67%
Πιερία (Pieria)	33.08%
Βοιωτία (Boeotia)	32.19%
Θεσσαλονίκη (Thessaloniki)	31.98%
Ημαθία (Imathia)	31.46%
Ρέθυμνο (Rethimno)	30.63%
Δυτική Αττική (Western Attica)	30.48%
Ικαρία, Σάμος (Ikaria, Samos)	30.25%
Ευρυτανία (Evrytania)	30.07%
Κιλκίς (Kilkis)	30.04%
Καρδίτσα, Τρίκαλα (Karditsa, Trikala)	29.46%
Ζάκυνθος (Zante)	27.99%
Χίος (Chios)	27.50%
Κεντρικός Τομέας Αθηνών (Athens Central Sector)	27.32%
Μαγνησία, Σποράδες (Magnesia, Sporades)	27.05%
Γρεβενά, Κοζάνη (Grevena, Kozani)	26.94%
Ηράκλειο (Heraklion)	26.87%
Εύβοια (Euboea)	26.54%
Αιτωλοακαρνανία (Aetoloacarnania)	26.01%

Green Transitioning: Job Offer (EU vs Greece)

Greece



Europe

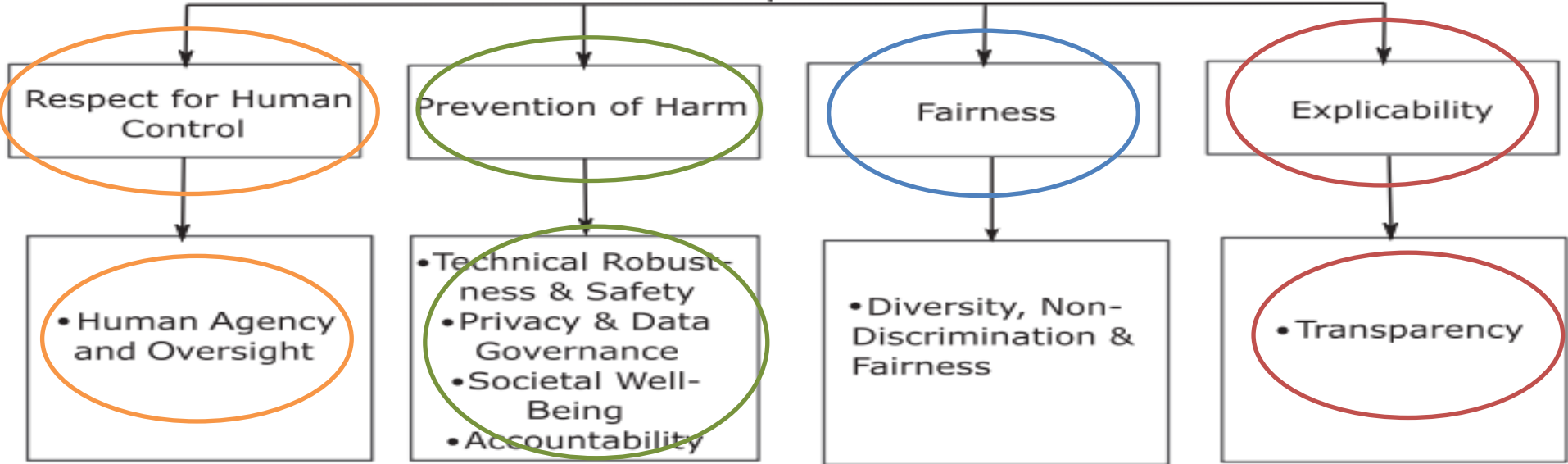


Trustworthy AI framework

Trustworthy Artificial Intelligence

Three Guidelines
(Lawful, Ethical, and Robust)

four **ethical principles**
composed of seven
essential requirements





Thank you!

Haris Papageorgiou

haris@athenarc.gr



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