EUROPEAN ENERGY REGULATION, SOCIO-ECONOMIC AND ORGANIZATIONAL ASPECTS: AN ANALYSIS OF BARRIERS RELATED TO DATA-DRIVEN SERVICES ACROSS ELECTRICITY SECTORS

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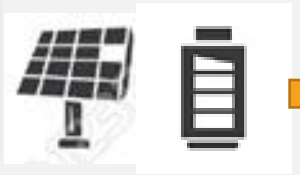
MOTIVATION

- The integrated electricity ecosystem suggests **different active actors** throughout the energy value chain.
- Different actors that interact with each other assume **vast amounts of data** with different characteristics that need to be processed, analyzed, and exchanged.
- Under this reality, **different issues arise** related to how data should be managed, protected, or exchanged.

MOTIVATION AND CHALLENGES

Decentralization



Control at the edge

Exponential increase of controllable assets

Complexity Increase

Digitalization

Huge Data Production

Meshed network of stakeholders

From Data Silos to Data Sharing

New Assets and DERs

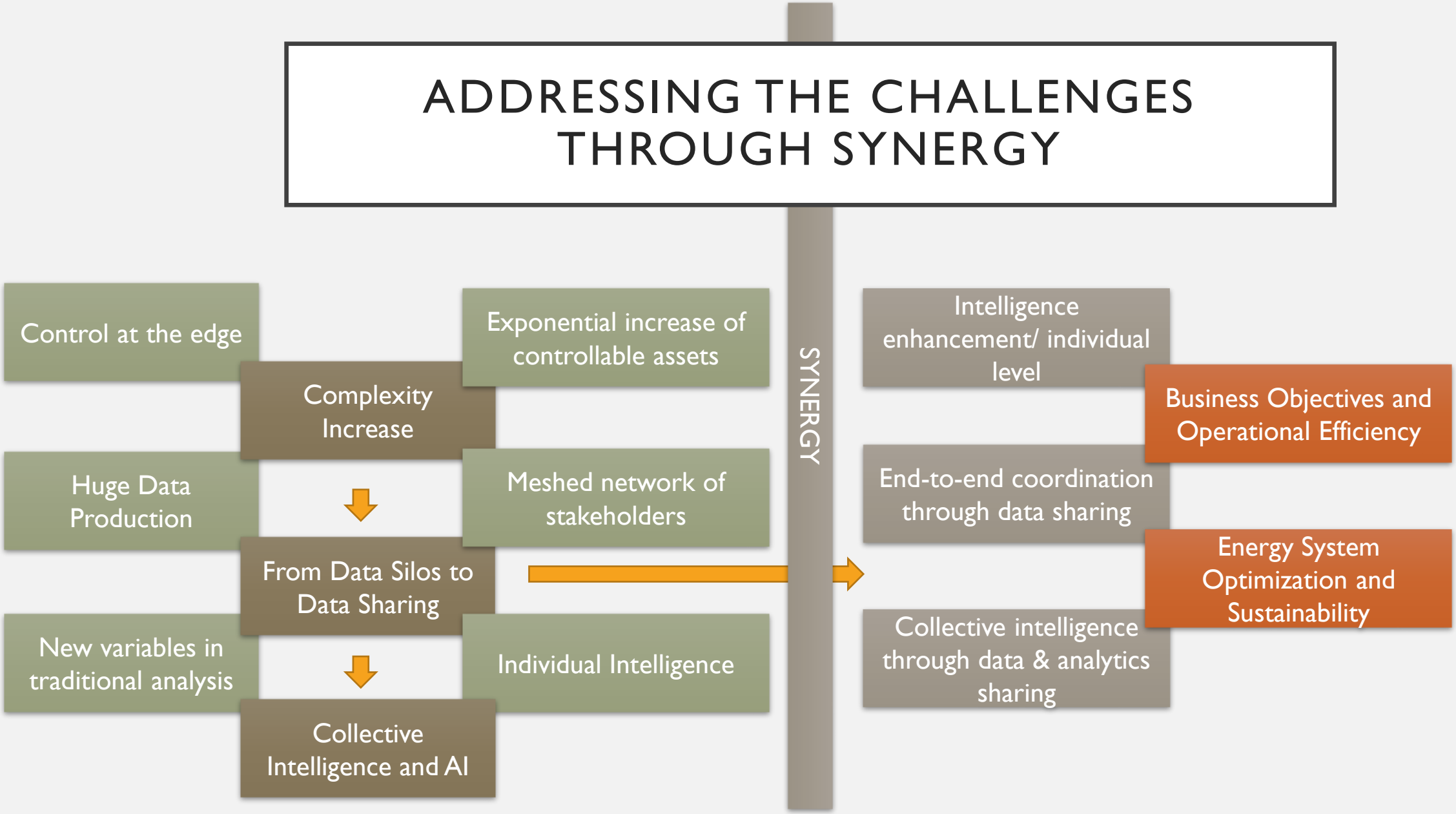
New variables in traditional analysis

Intra-organization Intelligence

Collective Intelligence and AI

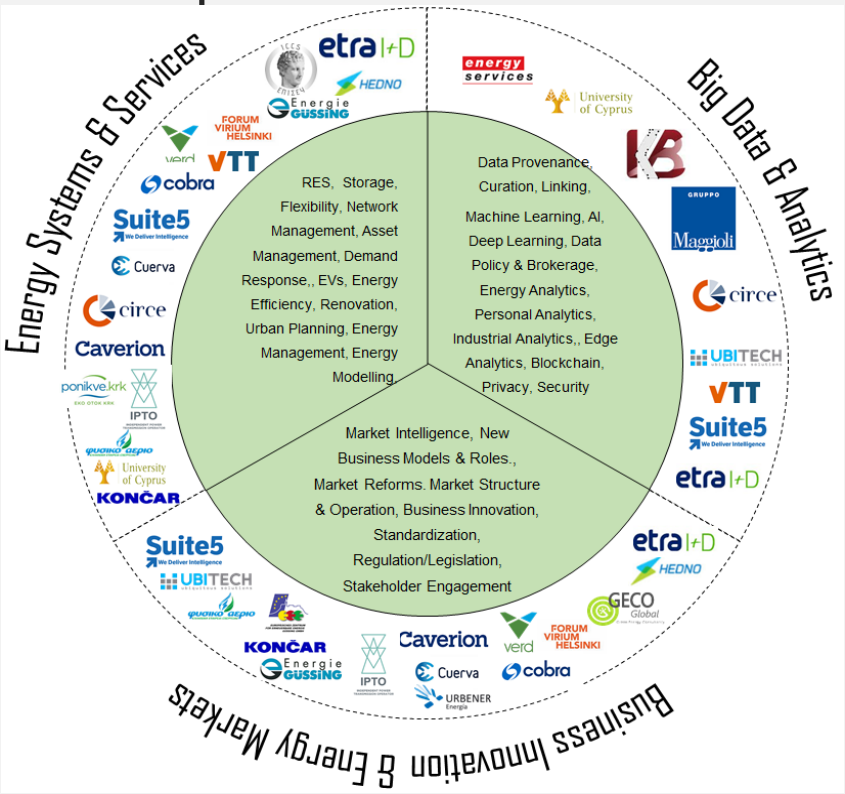
SYNERGY

ADDRESSING THE CHALLENGES THROUGH SYNERGY



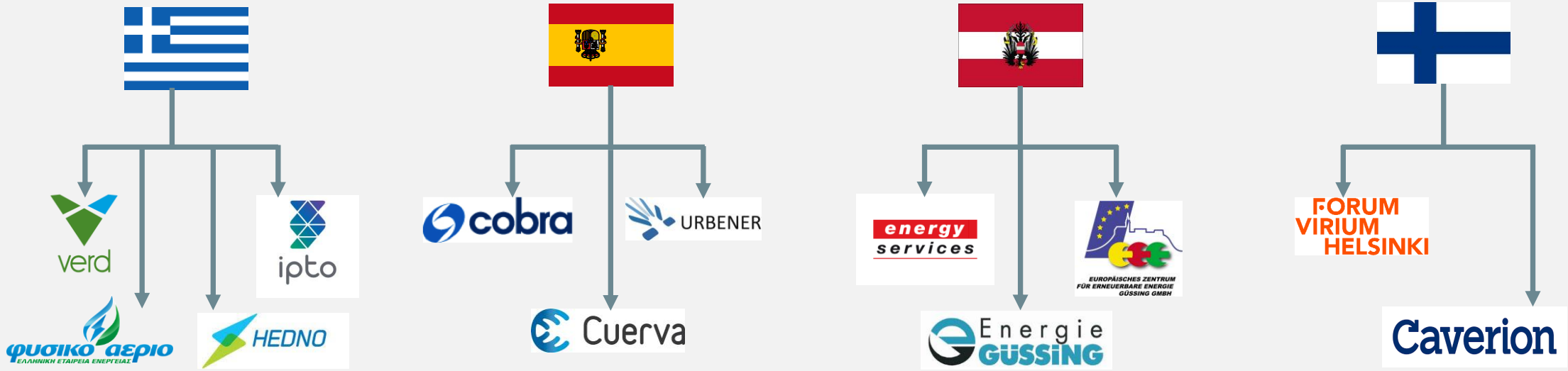
CONTRIBUTION

- A comprehensive analysis on the existence and importance of various regulatory obstacles regarding
  - innovative energy services,
  - data exchanges and,
  - data driven synergies.



CONTRIBUTION

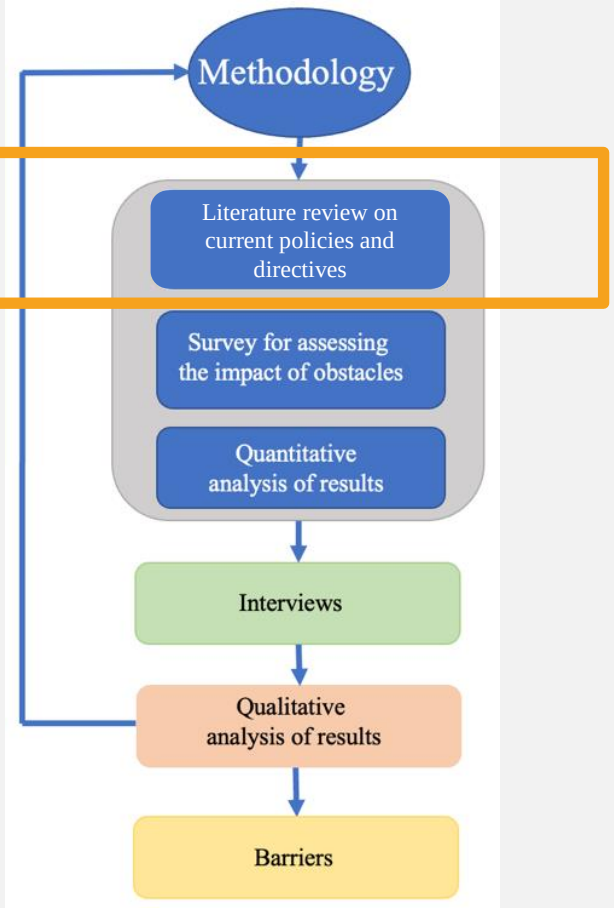
- A survey-based data gathering exercise was conducted
  - Across 5 countries.
  - Of 13 SYNERGY project demo partners.



CONTRIBUTION

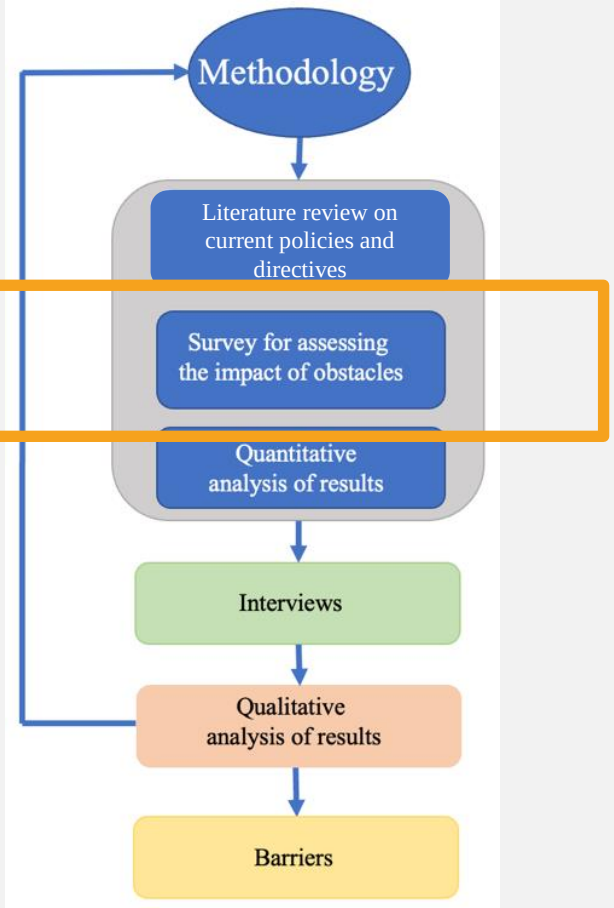
- As a result, the paper introduces
  - remedies,
  - alternative solutions,
  - best practices, and
  - recommendations.
- Towards enabling proactive decisions
  - on regulations that can severely jeopardize the implementation of data driven services,
  - on the design of the data driven platform/ applications, and
  - on the way demonstration activities will be implemented to overcome regulatory barriers.

METHODOLOGY



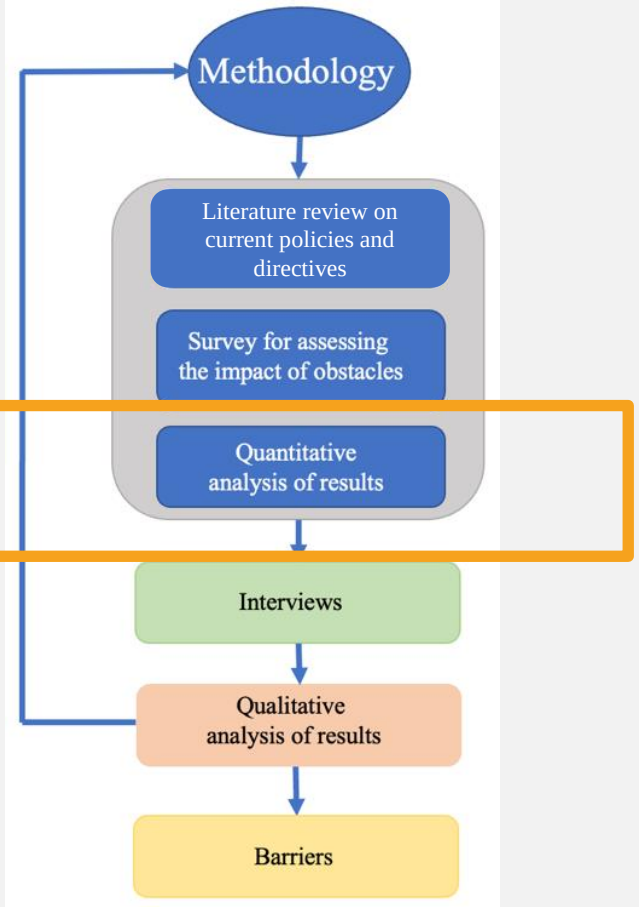
- A detailed analysis was performed in order to extract the list of aspects pertaining to the current or anticipated regulatory and legislative framework.
- A thorough investigation was performed on the current policies and directives, that are in principle associated with the various objectives and means of realization of data driven services in the energy domain.

METHODOLOGY



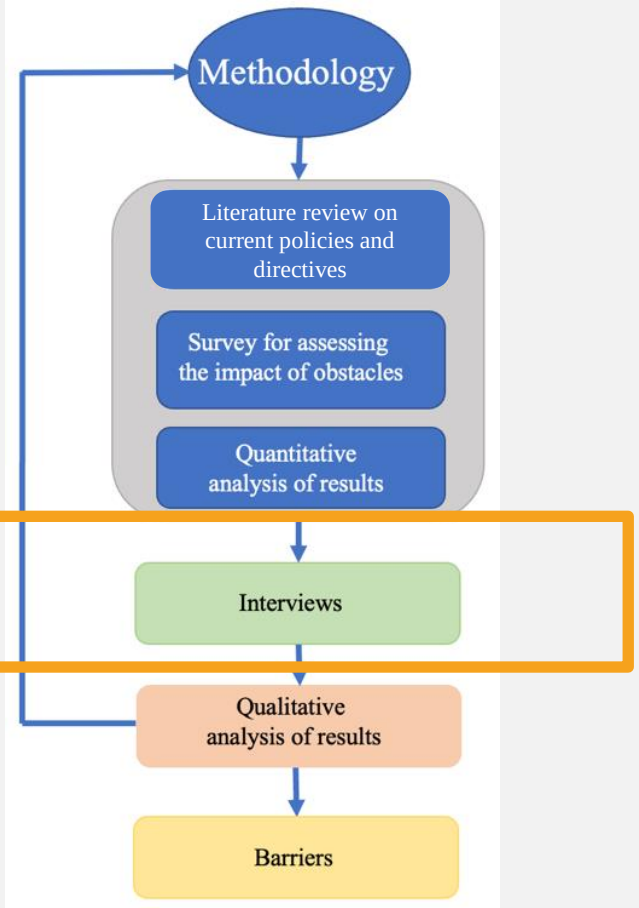
- A survey was conducted amongst the representatives
  - 13 large scale demonstrators, in Greece, Spain, Austria, Finland and Croatia
- The aim of this survey was:
  - To verify or discard the relevance of these EU policies to data driven services;
  - To quantify the importance of each regulation/policy;
  - To provide currently existing national legislation in all participating countries corresponding to the EU policies and;
  - To identify missing regulatory and legislative framework in all participating countries with respect to the associated EU policies.

METHODOLOGY



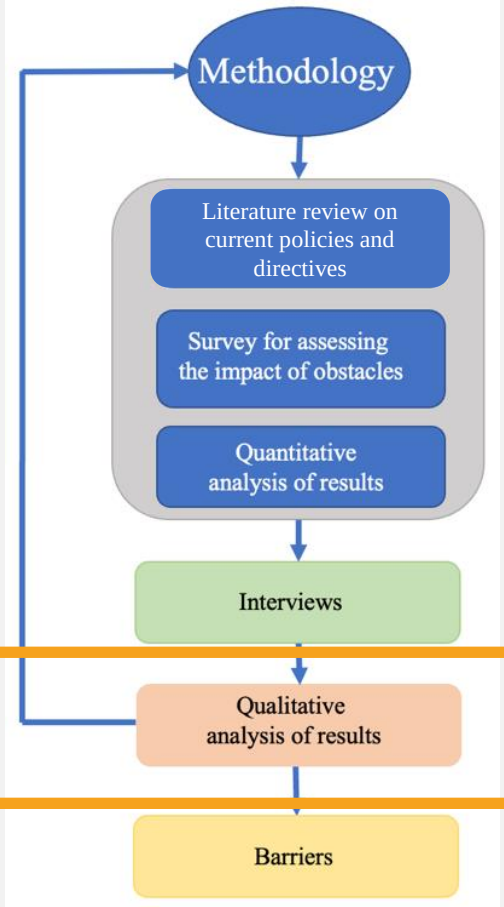
- A quantitative analysis was performed on the survey results
  - in order to derive the final list of existing/missing national legislation in the participating countries that are expected to hinder data driven innovation.

METHODOLOGY



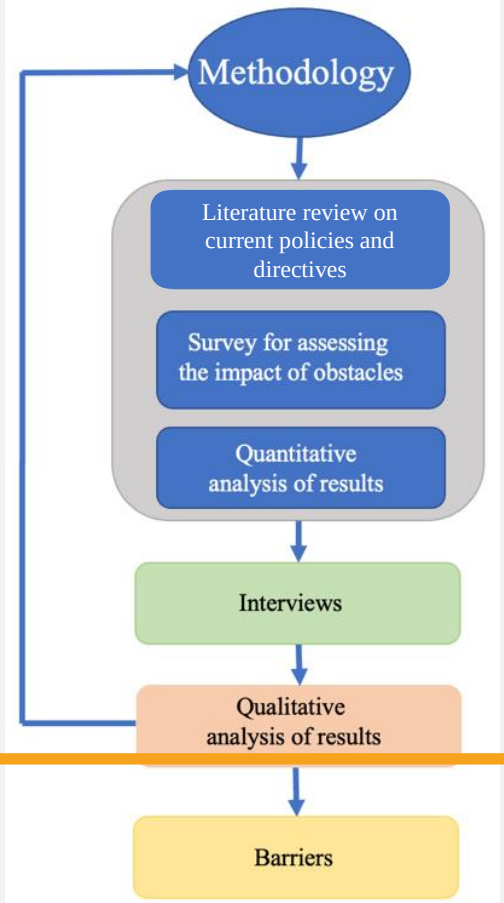
- Interviews were then conducted
  - To evaluate the survey results by stakeholder representatives.

METHODOLOGY



- Parallel to the importance of quantification of the different policies across the different countries
- Interesting contradictions/conflicts emerged through the qualitative analysis performed.

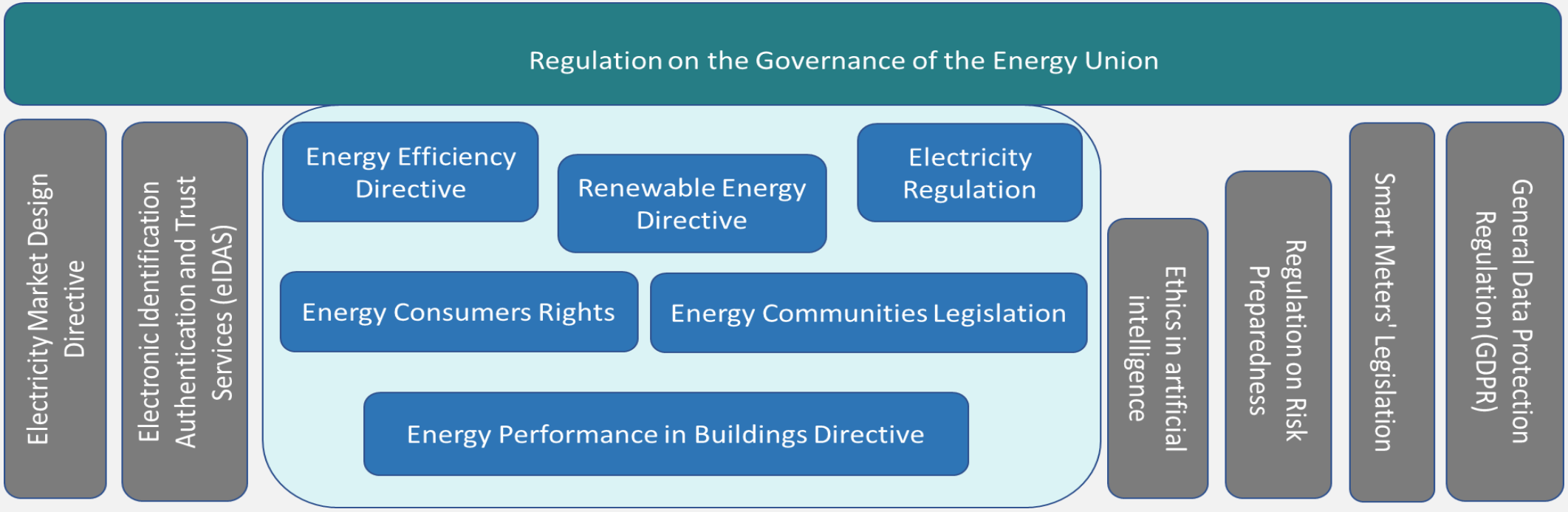
METHODOLOGY



- Under this analysis, the main regulatory barriers/ omissions for implementing innovative services related to data management/exchange are highlighted.

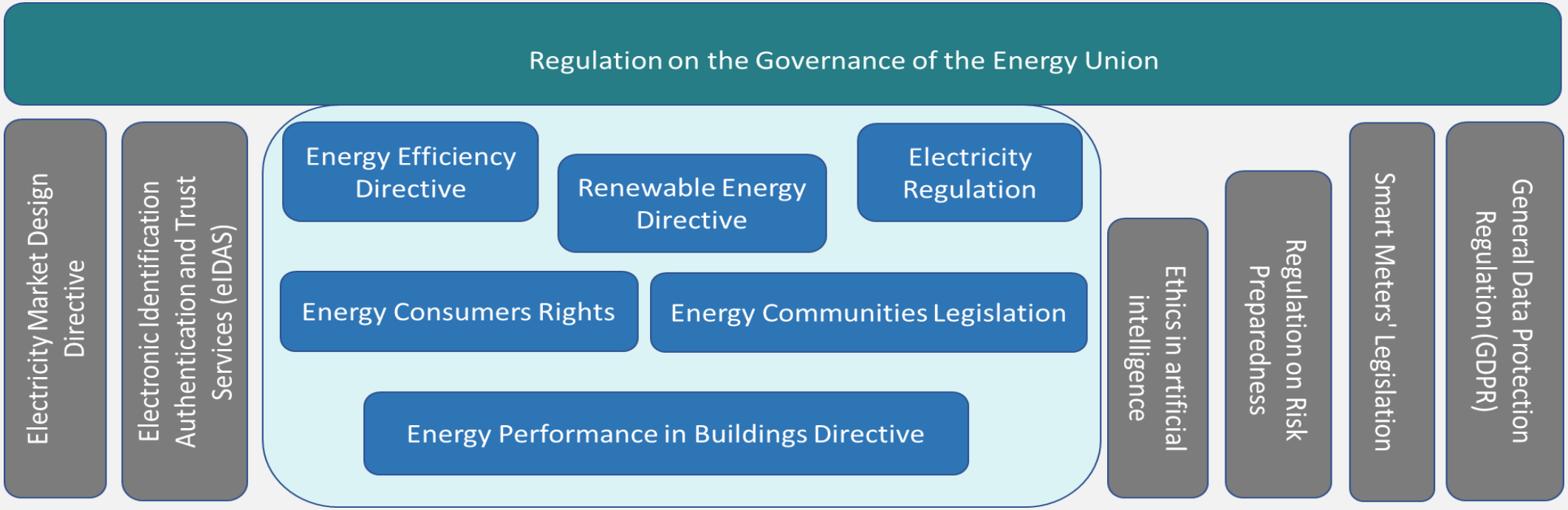
CATEGORIZATION OF REGULATIONS

- Different regulations and directives that affect the deployment and the realization of data driven services are overviewed.



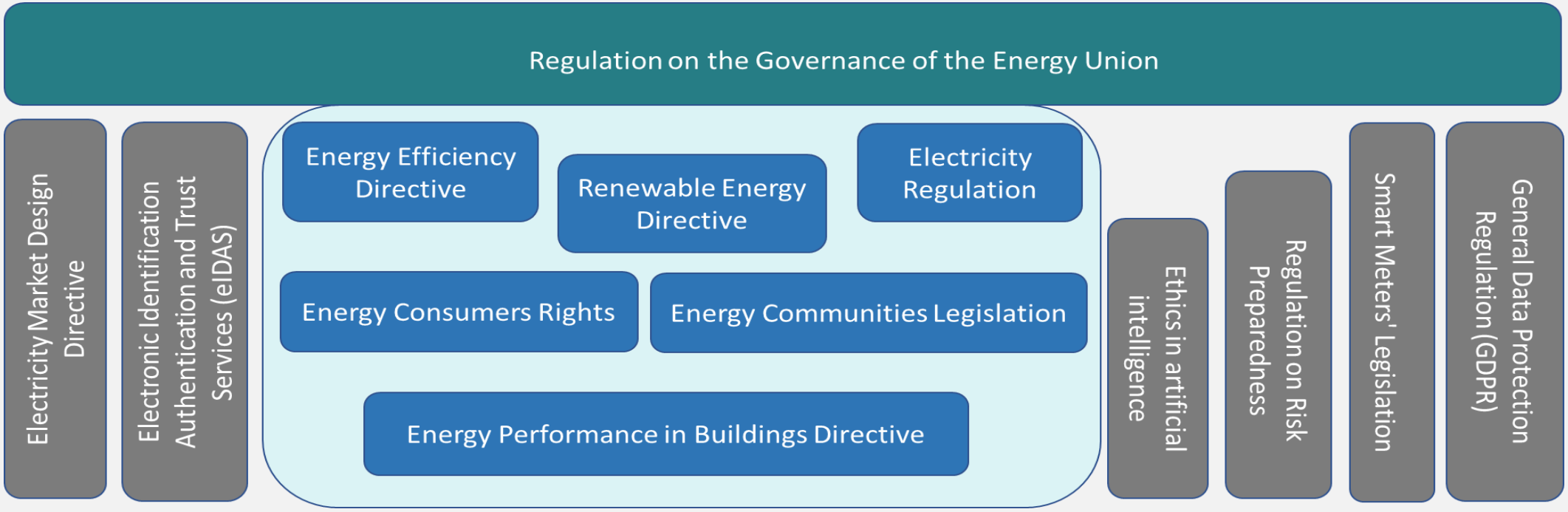
CATEGORIZATION OF REGULATIONS

- **Horizontal:** affect the whole energy value chain and all directives/regulations are following.



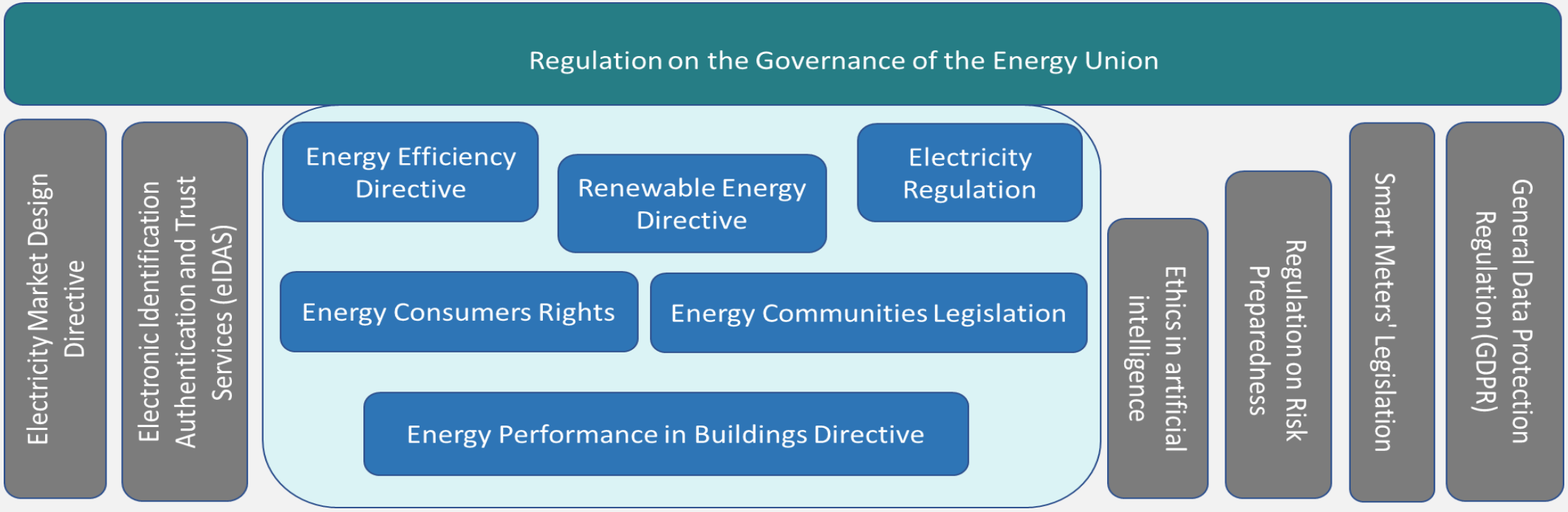
CATEGORIZATION OF REGULATIONS

- **Vertical:** act as facilitators through the value chain and can be either linked to technologies, applications or concepts.



CATEGORIZATION OF REGULATIONS

- **Hierarchical:** are under the horizontal regulations and facilitated by the vertical ones. These are applied in different levels of the power system and value chain.



QUANTITATIVE ANALYSIS

- The participants were asked to evaluate the importance of the regulation in data driven services.
- The collected responses are tabulated in the following table
  - in each cell a ranking from 1 (less important) to 5 (most important) is given based on the average of all answers.

The highlighted cells indicate that the regulation currently exists in the corresponding country

Question Number	Regulation	Greece	Spain	Austria	Finland	Croatia
RE-Q1	Regulation on the Governance of the Energy Union	3.12	3.08	3	3	3
RE-Q2	Regulation on Risk Preparedness	1.83	2.75	3	2	2
RE-Q3	General Data Protection Regulation (GDPR)	4.05	3.5	5	2.88	5
RE-Q4	Smart Meters' Legislation Identification	4.72	3.33	5	3.75	5
RE-Q5	Electronic, Authentication and Trust Services (eIDAS)	2.92	2.25	-	3.75	3
RE-Q6	Electricity Market Design Directive	4.47	4.42	-	3.38	2
RE-Q7	Ethics in artificial intelligence	3	2.63	3	3.38	3
RE-Q8	Renewable Energy Directive	3.77	4.42	3	2.38	4
RE-Q9	Energy Consumers Rights	3.22	0.83	3	2.63	5
RE-Q10	Energy Performance in Buildings Directive	2.08	-	-	4.63	5
RE-Q11	Electricity Regulation	4.58	4.67	3	3.38	5
RE-Q12	Energy Communities Legislation	2.25	0.67	-	3.13	4
RE-Q13	Energy Efficiency Directive	2.62	3.25	-	3.63	4

QUALITATIVE ANALYSIS

- The participants were asked to explain each of the answers in the previous table by specifying what potential barriers these updates might generate (e.g., additional financial costs, reconsideration of use cases, renovations on already approved buildings etc.).

CONCLUSIONS

- **Greece:**
  - Some legislations that are missing seem to be relevant but not of high importance.
  - Some relevant regulations that are missing at national level, are expected to be adopted under the National Regulatory Framework, as imposed by the EC.
    - Smart Contracts and Blockchain regulation are addressed in the eIDAS and GDPR regulations.

- **Spain:**
  - It seems that there are some omissions in regulations, but it is expected that these regulations will be in place at national level.

CONCLUSIONS

- **Austria:**
  - Most regulation is in place.
  - The Gussing area has the experimental status from the Austrian Government, which gives enough freedom to apply innovative concepts even in the case where some regulations are missing.

- **Finland:**
  - All regulation is in place, so no regulatory barriers are foreseen.

- **Croatia:**
  - Most regulations are in place.
  - The absence of the energy communities' legislation does not affect the implementation of data driven services.
  - The data driven services and data sharing mechanisms, will, in any case, ensure total compliance with eIDAS and GDPR.

THANK YOU!

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