



ENTEC

Energy Transition Expertise
Centre

Terms of Reference
Energy Data Spaces



Terms of Reference - Energy Data Spaces (Draft)



Consortium Leader

Fraunhofer Institute for Systems and Innovation Research ISI, Breslauer Straße 48, 76139 Karlsruhe, Germany

Barbara Breitschopf, barbara.breitschopf@isi.fraunhofer.de; Andrea Herbst, andrea.herbst@isi.fraunhofer.de

Consortium Partners

Fraunhofer Institute for Applied Information Technology FIT, Schloss Birlinghoven 53754 Sankt Augustin, Germany

Guidehouse, Stadsplateau 15, 3521 AZ, The Netherlands

McKinsey & Company, Inc., Taunustor 1, 60310 Frankfurt, Germany

TNO, Motion Building, Radarweg 60, 1043 NT Amsterdam, The Netherlands

Trinomics, Westersingel 34, 3014 GS Rotterdam, The Netherlands

Utrecht University, Heidelberglaan 8, 3584 CS Utrecht, The Netherlands

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Disclaimer

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1 Background and objectives

1.1 Original request from EC

1.1.1 Proposal for an EnTEC study to support the establishment of the common European data space for energy

Objective:

The study will contribute to the preparatory phase of establishing a common European data space for energy, as it was announced in the Data Strategy and in the Action plan on the digitalisation of the energy sector. More specifically, this study should perform a scoping exercise with regard to the types of data should be made available through the data space and the means and arrangements that are currently in place to make that data available.

1.1.2 Main topics covered:

The study will perform a mapping of the existing national and company-led initiatives for sharing energy data, and draw up an inventory of existing data initiatives, ecosystems and platforms (this includes key stakeholders, value chain and to some extent business logic and governance). The types of data considered of primary interest include: consumption and metering data, data used for flexibility services for the electricity sector (including aggregation and storage), data used for smart EV charging and V2G services, data from smart buildings and appliances (including PV inverters and heat pumps) that could be aggregated and used for energy services. However, other types of relevant data could be identified in the process and included in the analysis. Apart from the general review of existing data initiatives, the study should seek inputs from the Horizon Europe cluster of projects that aim to establish the grounds for a common European energy of the energy data space (HORIZON-CL5-2021-D3-01-01) and the coordination and support action int:net (HORIZON-CL5-2021-D3-01-03 - Interoperability community).

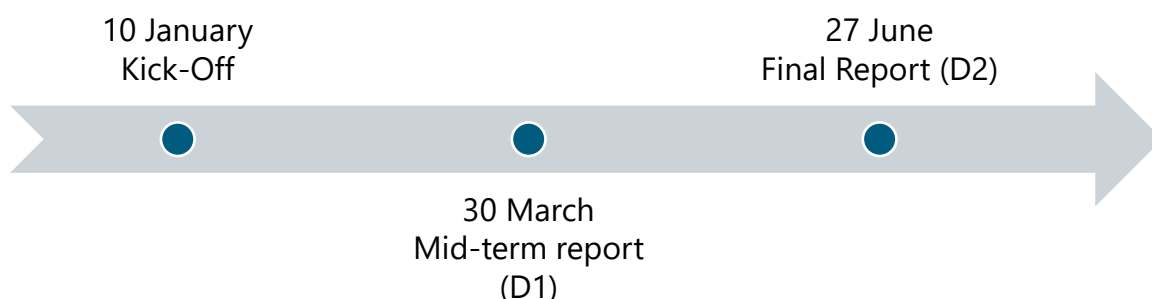
In relation to the inventory defined above, the study will synthesise the main use cases that are the drivers for the data exchanges identified, the data sets and data flows used, the actors that participate in these data exchanges, relevant business models and conditions for accessing the data, and geographical scope. Cross-sectoral usages should be also captured and described (e.g. synergies electricity-mobility).

The study will also analyse potential gaps, meaning areas where data should be made more widely available for developing innovative energy services but, due to various bottlenecks, not enough information is widely accessible to a variety of actors.

Finally, the study will propose the main use cases and data sets that should be deployed with priority through the upcoming common European data space for energy. The scope of data sharing and relevant building blocks for implementation for each use case should also be described (e.g. European exchanges, cross-border, national data exchanges complemented by EU-wide interoperability requirements etc.).

1.1.3 Timeline and Budget

Figure 1: Timeline of project



The project will be completed within six months starting with a kick-off on January, 10th. The final report is expected by June, 27th.

The required budget for this study is 250 project days that are split between the consortium partners as shown in the table below:

Table 1: Budget for work packages and consortium partners

Effort in project days	WP 0	WP 1	WP 2	WP 3	WP 4	WP 5	total
Fraunhofer	20	14	39	34	20	42	169
TNO		2.5	16	18	15.5	29	81
<i>total</i>	20	16.5	55	52	35.5	71	250

1.2 Project objectives & Scope

Further communication with EU COM on objectives and scope:

1.2.1 Questions from November, 18th:

We started planning and outlining the project and came across a few questions that we'd like to discuss with you:

- We understood the focus of the study should be on the 5 EDS projects under European Energy Data Space Call. Is that correct?
- What kind of documentation on the energy data space projects under call HORIZON-CL5-2021-D3-01-01 can be made available for the study? Will access to project proposals be possible?
- To what extent do you expect further GAIA-X activities in the energy sector to be covered?
- We understood the focus is on energy system technology (flexibility provision and further services) based on data space approaches. Discussion on current legislative proposals (such as the Data Act) is not within scope. Is that correct?

On an additional note, Fraunhofer IEE, Fraunhofer FIT and TNO are actively participating in the Horizon Europe Project "Enershare" which is one in five projects in the HORIZON-CL5-2021-D3-01-01 call to be analysed. Fraunhofer FIT is coordinating the int:net project for coordination and might also be contributing to the study. This brings a high level of detailed insight into Energy data space

projects into the study. However, we'd like to make you aware of these parallel roles. If this would lead to conflict of interest issues from your perspective, we should address that early in the project.

1.2.2 Answers by EU COM, November 21st

Please find below my views on the questions you raised:

- The scoping study we propose should actually look way beyond the Horizon Europe call you mention. We're in close contact with the five innovation actions that were selected as part of that call, together with the IntNet CSA. Thus, we should have quite good information coming from those projects and in fact this was what we've already asked the 5+1 project cluster to do – consolidate an idea of what the 'common European energy data space' should look like and should deliver;
- Having said that, we'd like the EnTEC study to expand beyond that and map other data exchange arrangements that exist in the energy sector (e.g. load aggregation platforms, virtual power plants etc, platform selling flexibility services etc.);
- By doing so, the study should present the state of the art with regard to data exchanges in energy (what data are exchanged, who are the actors, the scope of exchanges). The focus should be on the grid edge and data that involves multiple/diverse stakeholders (less so on the targeted data exchanges that are happening in the regulated realm, e.g. TSO-TSO or TSO-DSO exchanges for operating the grids);
- Finally, the study should present us an indication of what data should be integrated with priority in the upcoming common European energy data space and what should be the main use cases that would be most needed/have most value added. The idea is not to tell us what legislation would allow, but what the market and energy players need (and might be already deploying);
- The main features of the Horizon Europe projects mentioned above are already on the Cordis web page. Should you need more details, we'll need to investigate with our colleagues in CINEA what could be made available while avoiding any potential conflicts of interest;
- GAIA-X should be covered to the extent that is relevant for the points above;
- I don't see any conflicts of interest for Fraunhofer, but on the contrary, its presence in other projects would help to get a pragmatic outcome (and relevant examples) from the EnTEC study. We have asked the project cluster to cooperate closely anyway and we'll organise regular co-ordination meetings. The only part I see problematic would be full disclosure of other project applications (and that, as mentioned above, needs to be discussed with CINEA).

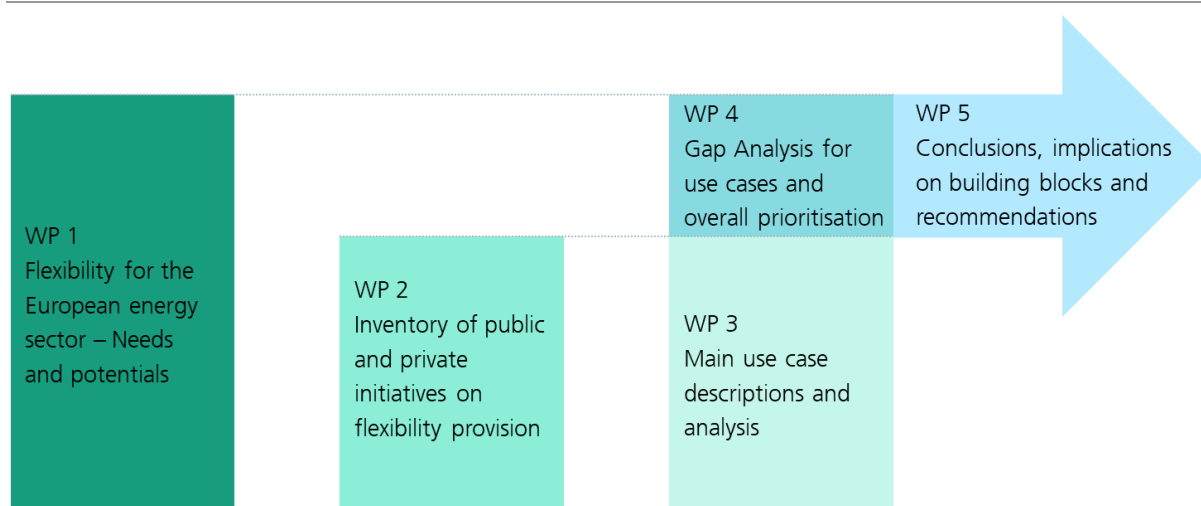
2 Tasks and approach

The main expected outcome of this EnTEC study is to describe the scope of data types required for digitally enabled flexibility services in the future European Energy Data Space, the scope will be derived from an inventory of current services and initiatives to provide flexibility services to the electricity market by private and public actors with the European Union, a gap analysis describing the additional needs for flexibility services compared to the potentials and needs for the overall energy transition and resulting recommendations on priorities in building the common European Energy Data Space as an enabler for this kind of digital services.

With these objectives in mind, we split the work into five work packages:

- 1) Flexibility for the European energy sector – Needs and potentials
- 2) Inventory of private and public European initiatives on flexibility provision
- 3) Main use case descriptions and analysis with special regard to data flows and business cases
- 4) Gap Analysis for use cases and overall prioritization
- 5) Conclusions, implications on building blocks and recommendations

Figure 2: Work package structure



2.1 Flexibility for the European energy sector – Needs and potentials

This work package will develop a baseline of the required and potential flexibility services in the energy transition scenario to provide 45% renewable energy in the electricity system by 2030 as set forth in the REPower EU plan.

Research and data from the earlier EnTEC study “Digitalisation of energy flexibility” will form the starting point. Additional research on areas such as battery storage, which was not covered, will be added and integrated.

The task will first provide an updated literature review on flexibility requirements and potentials. Based on that ranges of potential flexibility per sector will be determined and relevant barriers in the scientific and market literature will be identified for further analysis in WP3.

Table 2: Work organisation WP 1

T	What	When	Deliverable	Who Person Days	+
1.1	Review existing literature on flexibility requirements and potentials	Week 2-3	D1	Fraunhofer TNO (1,5)	(8,5)
1.2	Define ranges of potential of flexibility per sector	Week 4	D1	Fraunhofer (4)	
1.3	Identify barriers from review for WP3	Week 5	D2	Fraunhofer TNO 1	1,5
<i>total</i>				<i>16,5 person days</i>	

2.2 Inventory of private and public European initiatives on flexibility provision

In a collaborative market insight and research effort an inventory of currently existing private and public initiatives for flexibility provision that exists in the European Union will be developed. The consortium partner will pool their expertise and experience in the specific areas of interest to provide an extensive list of flexibility services. However, due to limited resources this list will provide full coverage of the whole EU. Together with EU COM we will define the list of features to be included. We'd expect the following characteristics within the scope of this work:

- 1) Technical Scope
- 2) Geographical scope
- 3) Technical readiness level
- 4) Maturity level
- 5) Actors involved
- 6) Funding structure
- 7) Digital Value Chain
- 8) Business Model
- 9) Governance

We expect that not all the information will be available. And further analysis may be limited to subsets of data.

Areas of interest that will be covered are consumption and metering, aggregation of RE portfolios, demand-side response and battery storage, e-mobility (smart EV charging and Vehicle-to-grid services) as well as smart buildings including heat pumps and PV inverters. Further services may be covered to a smaller extent after consultation with COM.

Table 3: Work organisation WP 2

T	What	When	Deliverable	Who + Person Days
2.1	Identify relevant initiatives	Week 3 – 5	D1	Fraunhofer TNO (6)
2.2	Assess scope and maturity	Week 6	D1	Fraunhofer TNO (4)

T	What	When	Deliverable	Who + Person Days
2.3	Assess ecosystem of solutions and initiatives	Week 7	D1	Fraunhofer (8) TNO (4)
2.4	Selection of main use cases for WP3	Week 8	D1	Fraunhofer (3) TNO (2)
<i>total</i>				55 person days

2.3 Main use case descriptions and analysis

Based on the inventory data, the core underlying use cases for the main flexibility services are identified. Priority will be given to use cases that are able to tap large volumes of flexibility in the different sectors identified based on the results of WP1. Technical maturity as assessed in WP2 will also be considered in the selection of use cases. These use cases will be further described with a special focus on the data flows and data models involved and the business models enabling the activities.

Furthermore, relevant building blocks to implement the use cases within a data space ecosystem will be listed. We will build on the building blocks as described in the Open DEI whitepaper “Design Principles for Data Spaces” and we will consider further documents by the Data Space Business Alliance as reference for this assessment.

Table 4: Work organisation WP 3

T	What	When	Deliverable	Who + Person Days
3.1	Describe data management in UCs	Week 8 - 9	D1	Fraunhofer (12) TNO (4) 16
3.2	Describe business models in UCs	Week 9 - 10	D1	Fraunhofer (8) TNO (8) 16
3.3	Describe relevant data space building blocks for UCs	Week 10 - 11	D1	Fraunhofer (4) TNO (10) 14
3.4	Mid-term report	Week 12	D1	Fraunhofer (4) TNO (0)
<i>total</i>				50 person days

2.4 Gap Analysis for use cases and overall prioritisation

For each of the areas of interest as mentioned in WP 2 a gap analysis based on the inventory data and the use case analysis is performed. Information on gaps will cover:

- Geographical coverage
- Maturity level
- Existence of viable business cases
- Availability of standardized data model

Use Cases and Gaps will then be reviewed with a general system perspective. Gaps to unlock large flexibility service potential will be identified. This overall review will lead to a prioritization of use cases and a list of related gaps to overcome. For this, workshops in cooperation with DG ENER will be considered.

Table 5: Work organisation WP 4

T	What	When	Deliverable	Who + Person Days
4.1	Gap Analysis per Use Case	Week10 - 11	D2	Fraunhofer (12) TNO (8)
4.2	Overall gap analysis on flexibility services	Week 12	D2	Fraunhofer (5) TNO (5)
4.3	Prioritisation of use cases and gaps	Week 13	D2	Fraunhofer (3) TNO (2,5)
<i>total</i>				35,5 person days

2.5 Conclusions, implications on building blocks and recommendations

This work packages concludes all findings from the study and addresses the additional research questions on relevant data sets, implications on building blocks for energy data spaces and interoperability requirements.

Recommendations for further actions on the European Energy Data Space will be discussed and developed in alignment with the int:net project led by Fraunhofer FIT in order to include insights from the ongoing Horizon Europe innovative actions.

All results will be compiled in a report document and a slide deck for presentation purposes.

Table 6: Work organisation WP 5

T	What	When	Deliverable	Who + Person Days
5.1	Summary on use cases and data sets	Week14 - 16	D2	Fraunhofer (15) TNO (10)
5.2	Summary on Data Space Building Blocks and interoperability	Week 16- 19	D2	Fraunhofer (15) TNO (10)
5.3	Recommendations for further actions and priorities for a common European Energy Data Space	Week 19- 22	D2	Fraunhofer (8) TNO (6)
5.4	Presentation and Reporting	Week 22 - 24	D2	Fraunhofer (4) TNO (3)
<i>total</i>				71 person days

3 Deliverable and reporting

Table 7: List of Deliverables and submission dates

Deliverable/meeting	Contents	Date	Outputs
M1	Kick-off for all tasks with EC	10/01/2023	pptx
D1	Mid-term report	30/03/2023	word
D2	Final report (all Tasks)	27/06/2023	word

** Note that the project can officially start only after the final approval of this ToR and a kick-off meeting with the Client. In the case that these two are delayed, the overall project timeline will have to be adjusted accordingly.

4 Work organisation

See tables in Chapter 3.

5 Resources

Table 8: Planned resources by task

Task/Resource	Resource needs in days	Share of total resources in percent
Project coordination	20	8.0
Task 1: Flexibility for the European energy sector – Needs and potentials	17,5	6.6
Task 2: Inventory of private and public European initiatives on flexibility provision	55	22.0
Task 3: Use case descriptions and analysis	52	20.8
Task 4: Gap Analysis for use cases and overall prioritisation	35	14.2
Task 5: Conclusions, implications on building blocks and recommendations	71	28.4
Total	250	100%

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