Exploitation and Marketing Plan for the involvement of

partners and future customers - draft

D13.6

Authors:

Padraic McKeever (Fraunhofer)
Emmanouil Zoulias (UoA)
Apostolos Kapetanios (ED)
Madalena Lacerda (E-REDES)
Ivelina Stoyanova (RWTH)
Helena Gerard (Vito)
Vladan Ristić (Energoinfo)
José Pablo Chaves Ávila (Comillas)
Anastasis Tzoumpas (Ubitech Energy)
Ferdinando Bosco (ENG)
Alexandre Lucas (INESC TEC)
Ákos Baldauf (BME)

Dominik Falkowski (Energa Operator)
Martin Chytra (ECD)
Luka Nagode (GEN-I)
Janne Huvilinna (Enerim)
Ermis Vasileiou (Ubitech Energy)
Romain Losseau (RTE)
Aleth Barlier (Enedis)
Beatriz Alonso Santos (i-DE)
Václav Janoušek (CEZ Distribuce)
Kalle Kukk (Elering)
Gonçalo Glória (NESTER)

Responsible Partner	Fraunhofer
Checked by WP leader	Daniela Bernardo, 27.04.2023
Verified by the appointed Reviewers	Deividas Šikšnys (Litgrid), 13.04.2023 Mário Couto (EPRI), 19.04.2023
Approved by Project Coordinator	Padraic McKeever, 28.04.2023

Dissemination Level	Public

Issue Record

Planned delivery date	30.04.2023
Actual date of delivery	28.04.2023

Version	Date	Author(s)	Notes
0.1		Padraic McKeever	First contributions added.
0.2	20230123	Padraic McKeever	WP8 contribution updated.
0.3	20230321	Emmanouil Zoulias, Vassilis Sakas, Madalena Lacerda, Ivelina Stoyanova, Helena Gerard, Vladan Ristić, José Pablo Chaves Ávila, Anastasis Tzoumpas, Dominik Falkowski, Martin Chytra, Luka Nagode, Janne Huvilinna, Ermis Vasileiou, Romain Losseau, Aleth Barlier, Beatriz Alonso Santos	Contributions added.
0.4	20230403	Václav Janoušek	Contributions added
0.5	20230405	Padraic McKeever	Updates after author review
0.6	20230427	Authors	Updates after internal review

Disclaimer:

All information provided reflects the status of the OneNet project at the time of writing and may be subject to change. All information reflects only the author's view and the European Climate, Infrastructure and Environment Executive Agency (CINEA) is not responsible for any use that may be made of the information contained in this deliverable.

About OneNet

The project OneNet (One Network for Europe) will provide a seamless integration of all the actors in the electricity network across Europe to create the conditions for a synergistic operation that optimizes the overall energy system while creating an open and fair market structure.

OneNet is funded through the EU's eighth Framework Programme Horizon 2020, "TSO – DSO Consumer: Large-scale demonstrations of innovative grid services through demand response, storage and small-scale (RES) generation" and responds to the call "Building a low-carbon, climate resilient future (LC)".

As the electrical grid moves from being a fully centralized to a highly decentralized system, grid operators have to adapt to this changing environment and adjust their current business model to accommodate faster reactions and adaptive flexibility. This is an unprecedented challenge requiring an unprecedented solution. The project brings together a consortium of over seventy partners, including key IT players, leading research institutions and the two most relevant associations for grid operators.

The key elements of the project are:

1. Definition of a common market design for Europe: this means standardized products and key parameters for grid services which aim at the coordination of all actors, from grid operators to customers and service providers;

2. Definition of a Common IT Architecture and Common IT Interfaces: this means not trying to create a single IT platform for all the products but enabling an open architecture of interactions among several platforms so that anybody can join any market across Europe; and

3. Large-scale demonstrators to implement and showcase the scalable solutions developed throughout the project. These demonstrators are organized in four clusters coming to include countries in every region of Europe and testing innovative use cases never validated before.

Table of Contents

Copyright 2023 OneNet   Page 4

*This project has received funding from the European Union's Horizon 2020
research and innovation programme under grant agreement No 957739*

List of Abbreviations and Acronyms

Acronym	Meaning
ABCM	Active Balancing Congestion Management
BRP	Balance Responsible Party
BUC	Business Use Case
DAaaS	Data Analytics as a Service
DSO	Distribution System Operator
FSP	Flexibility Service Provider
KER	Key Exploitable Result
MO	Market Operator
NA	Not Applicable
SaaS	Software as a Service
SO	System Operator
TRL	Technology Readiness Level
TSO	Transmission System Operator

Executive Summary

The objective of this work is to give stakeholders of the OneNet project insight into OneNet's results and to elaborate and document how the key results will be exploited after the project ends. OneNet's adoption of an open-source approach where possible allows a broad transfer of knowledge, findings, software code and tools to Research and Industry. This first version of the OneNet Exploitation and Marketing Plan has focussed on identifying the project's main results on a per-WP basis, and providing at least basic data on them, such as a description and the TRLs before and after the project. For many of the identified results, a fuller analysis has been made, identifying the target market, the marketing channel and the resources needed. The definition of the project's Key Exploitable Results (i.e. a selection and prioritisation of the results) has not yet been done in this version of the deliverable. This definition of KERs will be done in the final version of the deliverable, as will an analysis of how the partners plan to exploit the KERs.

1 Introduction

OneNet has produced results which include the definition of products and services, electricity market design, IT systems to support a pan-European electricity market, results coming from the implementation of OneNet's use cases in its demonstrators and results coming from the work done in OneNet in self-evaluation of its results. The most important results, i.e. the Key Exploitable Results (KERs) will be selected and prioritised and a business plan prepared for them, describing in detail and the exploitation strategy, covering the plans of each of the OneNet partners for the period after the project has ended.

The main stakeholders who will benefit from OneNet's results include DSOs, TSOs, Aggregators, FSPs, Market Operators, BRPs, Service Providers, Regulators, (end) Customers, the scientific community, Industry (especially ICT sector, technology providers), EU policy makers, local/regional/national authorities and other public bodies, EU citizen and consumer organisations.

OneNet is applying an open-source approach where possible, with the free transfer of findings, software code and tools.

1.1 Tasks Related to this Deliverable

This deliverable is strongly related to Task 13.5 "*Preparing long-term adoption of OneNet solutions*" and Task 13.6 "*Exploitation of the results*". In Task 13.5 the intention is to create close to market-ready products and to involve strategic partners in the preparation of a market rollout. Task 13.6 is concerned with the commercial exploitation and market uptake of the project's results, resulting in a business plan for each of the exploitable results. In these tasks, the Key Exploitable Results are identified as well as exploitation strategies developed.

1.2 Objectives of the Work Reported in this Deliverable

The objective of this deliverable is to give stakeholders of the OneNet project insight into OneNet's results and to elaborate and document how the results will be exploited after the project ends.

There will be two versions of this deliverable, this draft version (D13.6) and a final version (D13.7) at the end of the project. These two deliverables cover the results of both Tasks 13.5 and 13.6. The final objective is to presents the business plan for the exploitable results of OneNet, which deals with real activities where partners commit themselves to implement the project's results, having identified resources and first operative steps. The first version (D13.6) takes a first step by identifying OneNet's results.

The term Key Exploitable Result (KER) is used in Horizon 2020 for an "identified main interesting result (which has been <u>selected and prioritised</u> due to its high potential to be "exploited" – meaning to make use and derive benefits- downstream the value chain of a product, process or solution, or act as an important input to policy,

further research or education." [1] Here "result" is defined as "any tangible or intangible output of the action, such as data, knowledge and information whatever their form or nature, whether or not they can be protected, which are generated in the action as well as any attached rights, including intellectual property rights". Furthermore it is stated in [1] that

1. the selection and prioritisation of the results should be done using the following criteria: (a) Degree of innovation, (b) exploitability and (c) impact.

2. Results such as 'outcomes or announcements of consortia meetings, conferences or other events' are not considered as KERs.

3. Project deliverables are not necessarily KERs.

The following Technology Readiness Levels (TRLs) are used to characterise the exploitable results' status[1]:

- TRL 1 – basic principles observed
- TRL 2 – technology concept formulated
- TRL 3 – experimental proof of concept
- TRL 4 – technology validated in lab
- TRL 5 – technology validated in relevant environment (industrially relevant environment in the case of key enabling technologies)
- TRL 6 – technology demonstrated in relevant environment (industrially relevant environment in the case of key enabling technologies)
- TRL 7 – system prototype demonstration in operational environment
- TRL 8 – system complete and qualified
- TRL 9 – actual system proven in operational environment (competitive manufacturing in the case of key enabling technologies; or in space)

Exploitation means the utilization of results in further research activities other than those covered by the project, or in developing, creating and marketing a product or process, or in creating and providing a service, or in standardization activities. This means making use of the results; recognizing exploitable results and their stakeholders to concretise the value and impact of the project activity for societal challenges. The exploitation can be commercial, societal, political, or for improving public knowledge and action. The project partners can exploit results themselves or facilitate exploitation by others (e.g. through making results available under open licenses) [2].

This deliverable D13.6 has focussed on identifying the Exploitable Results of the OneNet partners and giving some basic data on them, in particular describing what the result is and what its TRL before and after the project

---

[1] From https://ec.europa.eu/research/participants/data/ref/h2020/other/wp/2016_2017/annexes/h2020-wp1617-annex-g-trl_en.pdf

is. So far, the results identified have not been selected and prioritised into the main interesting results, as per the above definition of KER.

The release of this D13.6 will be followed by holding two exploitation workshops where the project partners will have the opportunity to select and prioritise the results, identify the KERs, to elaborate their exploitation of the key results and to share knowledge gained in the project. The outcome of this work will be documented in D13.7.

As part of Task 12.2 "Management of external call and cascading fundings", OneNet published an open call on December 1st 2021 to recruit 9 third parties to submit project proposals to develop of new tools, services and activities related to scenarios associated with the OneNet demonstrators, as reported in D12.1 [3]. The resulting 9 projects are reaching conclusion at the time of preparation of this D13.6 and the corresponding results and their exploitation are reported on in Chapter 2.

1.3 Outline of the Deliverable

Chapter 2 describes the individual OneNet Exploitable Results, offered within the OneNet architecture, with a reference to the target group and the corresponding exploitation strategy. Chapter 3 describes the OneNet partners' exploitation plans. The last chapter sums up the conclusions.

1.4 How to Read this Document

This deliverable is a standalone and closed document, which has in no special relation to other deliverables. The final version of this deliverable is D13.7 "*Exploitation and Marketing Plan for the involvement of partners and future customers – final*" due at the end of the project.

The OneNet results are organised in Chapter 2 according to the internal project structure:

- WP2 defines products and services to enable a customer-oriented operation in a European integrated grid.
- WP3 defines the concepts for new market structures creating unique conditions of interaction of multi-multi-multi, i.e. interactions among different players at each level: TSO, DSO and customers.
- WP4, brings the market results in the network operation defining the necessary adaptation in grid operation both at TSO and DSO level.
- WP5 and WP6 deal with IT, defining and implementing the concept of interoperable network of platforms.
- WP7, WP8, WP9 and WP10 are four clusters of demonstrations, covering the north, south, west and east of Europe respectively. Each cluster implements the multi-multi-multi vision providing a mix of use cases and innovative scenarios going across countries and different operators.

- WP11 supports demonstration clusters to set KPIs and achieve results in the most cost-effective approach.
- The results of the projects run as part of the OneNet Open Call with the aim of enhancing OneNet's results with both real demonstration efforts and tools to elevate the OneNet overall framework, see OneNet D12.1, "Report on the activities of the open call".

OneNet will produce a set of open datasets, which are listed in D14.1 [4] and will be published on the Zenodo platform (https://www.zenodo.org/). These open datasets are not included in this D13.6 as results and not elaborated on in Ch. 3 or 4.

2 OneNet's Exploitable Results

This chapter describes the exploitable results identified so far in OneNet. It is organised into sub-chapters on a per WP or per demonstration cluster basis. In the final version of this deliverable (D13.7), when the results have been selected and prioritised (i.e. the Key Exploitable Results of OneNet defined), this way of organising the results may be changed to remove this dependence on the project structure.

The following table gives an overview of all exploitable results and their relevance for the various target groups, which are System Operators (TSOs, DSOs), Market Operators, Standardisation Bodies / Regulators, public bodies and authorities, policy makers, aggregators, consumers (households, businesses, industry), energy communities, citizen and consumer organisations, FSPs[2], researchers and other industry actors. The target group "Research" comprises institutions and universities. The target group "Industry" includes business actors who could serve as providers for hard- or software or as providers for other services e.g. telecommunication services.

The mark x in the table shows when the target group can directly utilize the result for operational or research activities, the mark (x) shows when the target group does not directly utilize the result but benefits indirectly from the usage or implementation.

Table 1: Overview of all Exploitable Results of OneNet, the TRL-levels and the relevance for the target group

Exploitable Result↓ / TRLs & Target Groups→	TRL start	TRL end	Open Source	SO	MO	Standards Body / Regulator	Public Bodies &Authorities	Policy Makers	Aggregator	Consumer	Energy Communities	Citizen & Consumer Orgs.	FSP	Researcher	Industry
WP2: Products and services definition in support of OneNet															
Review of best practices in other H2020 projects and commercial initiatives	NA	NA	NA	x	x	x									x	
Framework for system services, products and harmonisation of products	NA	NA	NA	x	x	x		x						x	
Demonstrators' BUCs, Regional and general BUCs	NA	NA	NA	x	x	x								x	
Methodology for replicability and scalability analysis for OneNet	NA	NA	NA	x	x	x								x	

---

[2] FSP stands for Flexible Service Provider defined as any entity that offers flexibility services in the market, based on acquired (aggregated) capabilities, usually from third parties.

Exploitable Result ↓ / TRLs & Target Groups →	TRL start	TRL end	Open Source	SO	MO	Standards Body / Regulator	Public Bodies &Authorities	Policy Makers	Aggregator	Consumer	Energy Communities	Citizen & Consumer Orgs.	FSP	Researcher	Industry
Set of KPIs for OneNet	NA	NA	NA	x	x	x								x	
Recommendations for the Harmonised Electricity Role Model	NA	NA	NA	x	x	x	x	x						x	
WP3: Integrated and coordinated markets for OneNet															
Living Document Market Design	NA	NA	NA	x	x	x	x	x				x		x	
Coordinated TSO-DSO Flexibility Market Simulator and Market Clearing Module	3-4	4-5	No	x	x	x	x	x				x		x	
WP4: Integrated System Operation for OneNet															
WP4 methodology for the integration of previous project results	NA	NA	NA	x	x	x	x	x				x		x	
WP5: Open IT Architecture for OneNet & WP6: Reference IT Implementation for OneNet															
OneNet Connector	4	8	Yes	x	x									x	
Cross-Platform-Services Catalogue	2	8	Yes	x	x									x	
Orchestration Workbench	5	7	Yes	x	x									x	x
Reference Data Governance Model	NA	NA	NA			x	x	x	x						x
Tools for Legal, Regulatory, Privacy and Cybersecurity Compliance	4	7	Yes	x	x					x			x		x
Western Cluster															
STAR blockchain Platform	4	5	Yes	x						x					
Study on coordination models	NA	NA	NA	x											
OMIE Local market platform (LMP) – Short-term	2	5-6	No	x	x					x	x		x		x
OMIE Local market platform (LMP) – Long-term	2	5-6	No	x	x					x	x		x		x
DSO and TSO Data Exchange Platform (DDEP & TDEP)	6	8	No	x											
Methodology for the estimation of flexibility potential from MV clients	NA	NA	NA							x				x	

Exploitable Result↓ / TRLs & Target Groups→	TRL start	TRL end	Open Source	SO	MO	Standards Body / Regulator	Public Bodies &Authorities	Policy Makers	Aggregator	Consumer	Energy Communities	Citizen & Consumer Orgs.	FSP	Researcher	Industry
TSO Flexibility Needs Evaluation and FSP flexibility provision simulation Tool [PT Demo]	4	6-7	No	x											
Short-Circuit current forecast Tool in TSO-DSO substations	4	6-7	No	x											
Eastern Cluster, Slovenia															
Flexibility Market Platform	7	8	No	x	x				x	x	x		x	x	
Module for automated activations enables scalability of flexibility projects	6	7	No	x					x	x	x				
Eastern Cluster, Poland															
atFlex Platform	2	7	Yes	x	x										
TSO-DSO coordination algorithms	2	7	No	x	x										
Eastern Cluster, Czechia															
Network traffic light system	5	8	Yes	x					x						
Non-frequency ancillary services market platform	1	6	Yes	x					x						
Eastern Cluster, Hungary															
TSO-DSO coordination	1	7	NA	x									x		
FSP accreditation methodology (Flexibility Register)	1	6	NA	x									x		
Southern Cluster															
F-channel forecasting module	3-4	6	Yes	x					x	x	x			x	
F-channel coordination module	3-4	6	Yes	x					x	x	x			x	
ABCM platform	3-4	6	No	x											
Northern Cluster															
Harmonized market products	NA	NA	NA	x	x								x		
TSO-DSO Coordination Platform	8	8	No	x	x								x		
Optimization-based market clearing module	3	6-7	No	x	x										
Flexibility Register	6-8	8	No	x	x								x		

Exploitable Result	TRL start	TRL end	Open Source	SO	MO	Standards Body / Regulator	Public Bodies & Authorities	Policy Makers	Aggregator	Consumer	Energy Communities	Citizen & Consumer Orgs.	FSP	Researcher	Industry
Nord Pool locationally enhanced intraday module	1	6	No	x									x		
WP11: From OneNet demonstrators to EU wide implementation of coordinated market schemes and interoperable platforms for standardized system products															
OneNet KPIs repository	NA	NA	Yes	x										x	x
Definition and analysis of Business Models for OneNet BUCs	1	2	Yes	x		x	x	x	x	x	x	x	x	x	
Strategies for customer engagement in the provision of system services	4	6	Yes	x		x	x		x		x	x		x	
Methodology for market architecture harmonization analysis	4	8	Yes	x	x	x	x	x	x	x	x	x	x	x	x
Methodology for market phase harmonization analysis	4	8	Yes	x	x	x	x	x	x	x	x	x	x	x	x

More details about each of the results can be found in the following chapters, which include subchapters with detailed description of the result, its target group and why it is of relevance for the target group as well as one subchapter about the exploitation strategy.

In addition to the results listed in Table 1 above, the results from the nine projects run in the context of the OneNet Open Call are presented in Ch. 2.13 below.

2.1 WP2: Products and services definition in support of OneNet

KER	Main impact domain
Review of best practices in other H2020 projects and commercial initiatives.	Commercial
Development of a framework for system services, products and harmonisation of products. These frameworks crystalised on OneNet's standardized products.	Commercial
Demonstrators' BUCs, Regional and general BUCs.	Commercial
Set of KPIs for OneNet.	Commercial
Methodology for replicability and scalability analysis for OneNet.	Societal
Recommendations for the Harmonised Electricity Role Model.	Policy

2.1.1 Review of best practices in other H2020 projects and commercial initiatives

Name:	Review of best practices in other H2020 projects and commercial initiatives
Description	In total 15 H2020 projects have been reviewed, which were selected based on criteria such as their call ID and topic, their maturity level, and the coordination scheme (TSO-DSO-consumer). Furthermore, 4 national initiatives due to their affinity to OneNet project were also analysed. The main findings of this review process are stated below: • A common feature among various projects is that regarding system services definition, they all consider addressing a scarcity/need by the network operator as the driver of the service. However, although they all consider different definitions of products, they all indicate that products are the means network operators use to solve the scarcities they face. • The delivery of frequency control services, mainly provided by TSOs, includes a set of well-established products that are considered in almost all projects evaluated, while for non-frequency control services there appears to be more heterogeneity among the products definitions where all projects adopt their own product definitions. • Congestion management, frequency control and voltage control are the services most frequently addressed within the reviewed projects. From a total number of 13 projects that have identified the services that they consider, 12 of them consider congestion management, 11 of them consider frequency control, while 10 of them consider voltage control.

	• As pointed out by the analysis of the reviewed projects, several mechanisms have been explored for the procurement of the grid services required by the DSOs or TSOs. This analysis also shows that the majority of the projects address the coordination among main actors TSOs and DSOs and the arrangements or contracts of them with FSPs. However, a relevant share of reviewed projects concerns the joint coordination of TSO, DSO, and flexible service providers. • IEC-62559-2 is the most commonly used methodology among the 15 projects regarding the Business Use Cases (BUCs) definition, which is also the methodology that the OneNet project will use. • Most of the projects use the Smart Grid Architecture Model (SGAM) approach to link the developed use cases with ICT infrastructures and to define the interface's boundaries and functionalities among market operator and grid operators. • Further digitalization, handling data management and security issues, as well as standardization, were the challenges that most of the projects faced and should be addressed at the European level. • From the national projects, OneNet can utilize mature concepts from flexibility marketplaces and platforms regarding assets prequalification process, data exchange architectures, developed interfaces among actors in the energy value chain, and innovative services directly provided by standardized products from existing wholesale markets. For more information please refer to Deliverable D2.1, available in the link below: https://onenet-project.eu/public-deliverables/
Innovativeness introduced compared to already existing Products/Services	The information gathered from the presented national projects and collaboration initiatives showed that OneNet can utilize mature concepts from flexibility marketplaces and platforms regarding assets prequalification process, data exchange architectures, developed interfaces among actors in the energy value chain, and innovative services directly provided by standardized products from existing wholesale markets.
Unique Selling Point USP - Unique Value Proposition UVP	Provides valuable insight on the specific domain.
"Market" – Customers	• System operators • Market operators • Regulators • Scientific community

"Market" - Solution already on the market	Bibliography and publications.
Go to Market – Use model	Publications and dissemination activities.
Time to Market	2023-2024
Open Source (yes/no)	Public
Partners involved inside the consortium	WP2 partners
Partners involved outside the consortium	NA
How the KER will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	Publications.
Status of IPR (if applicable)	NA
TRL before the project	NA
TRL after the project	NA

2.1.2 Framework for system services, products and harmonisation of products

Name:	Framework for system services, products and harmonisation of products
Description	Development of a framework for system services, products and harmonisation of products. These frameworks crystalised on OneNet's standardized products.

This KER elaborates a theoretical framework for products building on the discussions on systems services and products developed in previous research and innovation projects. The product framework poses three main questions that need to be considered in the identification of the products: (i) what the SO is going to use the product for, (ii) what the relevant attributes for the product are, and (iii) what the values of the different attributes are.

For more information please refer to Deliverable D2.2, available in the link below:

https://onenet-project.eu/public-deliverables/ |
| Innovativeness introduced compared to already existing Products/Services | Using that framework, we developed a number of harmonised products that address the need for common system services exploiting all network resources, which are then mapped against the different services and products demonstrated in the OneNet clusters of demonstrator partners. Harmonised products are products where there is some degree of convergence but at the same time still margin for differentiation between the products. Under this |

definition, standard products are just one extreme option inside of a spectrum of potential levels of harmonisation (i.e. standardised products are fully harmonised products). To identify the level of potential harmonisation, expected benefits need to be compared with the costs to surpass any harmonisation barrier. In those cases where the benefits surpass the costs, it would be advisable to increase the harmonisation between products.

Through framework analysis, we found that products can be split up into two main groups. The first group is the frequency control products group. These products have a larger margin for harmonisation as potentially larger benefits could be achieved by harmonising between bidding zones as they do not require locational information. Furthermore, TSOs have a good understanding of these products as they have been using them for a while which reduces the costs of harmonisation. Our approach is consistent with the current where frequency control products are being harmonised by the TSOs through a number of projects (e.g. PICASSO[1], MARI[2], TERRE[3]). As these efforts are already ongoing, we based our own harmonised products on those being developed in these projects.

The second group of products is the non-frequency control products group. The need for harmonisation in these products is smaller as they are location-specific, meaning that the main rationale for harmonisation would be to facilitate the interactions between TSO-DSO-consumers by reducing the diversity between products. Furthermore, the potential barriers to harmonisation could also be higher as DSOs have only recently started using / considering some of these products and this could result in harmonised products that do not work for some of the SOs. For this second group of products, an approach with a certain degree of harmonisation was developed to facilitate the coordination between TSO-DSO-customers without attaining full harmonisation. A list of attributes was identified that would allow an FSP to understand whether they can deliver the product, but at the same time allowing a certain degree of variety among the values for some of the product attributes.

In the next step, the developed standard products were compared with the products being proposed by the OneNet demonstrators. We found that, among the demonstrator partners, there is a focus on the non-frequency control products, where there is currently less practical experience.

These harmonised products were also compared against the products that TSOs and DSOs (inside of the

project as well as outside) had identified as potential future products. This comparison shows that the harmonised products included all the relevant products identified by the different SOs. Furthermore, as part of that analysis it also became clear that both TSOs and DSOs are considering similar non-frequency products. Therefore, there would appear that consistency between the definition of these products could also facilitate the TSO-DSO coordination as well as the operations of the FSPs as they would only need to identify one set of products instead of separate products for TSOs and DSOs.

Finally, in this project we also considered the potential evolution of product design. We identified two extreme evolutions. The first extreme is the supermarket approach where SOs would have the full responsibility to identify the best FSP for their needs at each point in time and the second extreme is the superproduct where FSPs should provide one product that the SO can use to address all its needs. Even if those two extreme approaches are unlikely to arise, potential hybrid options were identified that could facilitate the integration of all different sources of flexibility into the management of the energy systems.

Unique Selling Point USP - Unique Value Proposition UVP	Provides valuable insight on the specific domain.
"Market" – Customers	• System operators • Market operators • Policy makers • Regulators • Scientific community
"Market" - Solution already on the market	Bibliography and publications.
Go to Market – Use model	Publications and dissemination activities.
Time to Market	2023-2024
Open Source (yes/no)	Public
Partners involved inside the consortium	WP2 partners
Partners involved outside the consortium	NA
How the KER will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	Publications. Standards.
Status of IPR (if applicable)	NA
TRL before the project	NA
TRL after the project	NA

2.1.3 Demonstrators' BUCs, Regional and general BUCs

Name:	Demonstrators' BUCs, Regional and general BUCs
Description	One of OneNet's innovation pillars is to create an integrated marketplace for system services by contributing to the construction of the European Internal Market for electricity. The main objective of this KER was to produce a set of Business Use Cases (BUCs) for all demonstrators in the four clusters (Northern, Southern, Western, Eastern) and to evaluate them to ensure that are well-positioned and linked with the priorities set by the Green Deal and respectively with the project's strategic objectives. It presents a set of BUCs, that will materialize the OneNet products and services. For this, the standardized IEC Use Case methodology was applied, which is based on the IEC 62559 template, in order to enable a common understanding of functionalities, actors and processes across the different demo BUCs. For more information please refer to Deliverable D2.3 available in the link below: https://onenet-project.eu/public-deliverables/
Innovativeness introduced compared to already existing Products/Services	The cross analysis of the BUCs showed that there is a clear focus on the provision of non-frequency ancillary services, while regarding the type of coordination the number of BUCs considering market-based TSO-DSO coordination, market-based DSO coordination and technical-based TSO-DSO coordination respectively is equally distributed.
Unique Selling Point USP - Unique Value Proposition UVP	Provides valuable insight on the specific domain.
"Market" – Customers	• System operators • Market operators • Regulators • Scientific community
"Market" - Solution already on the market	Bibliography and publications.
Go to Market – Use model	Publications and dissemination activities.
Time to Market	2023-2024
Open Source (yes/no)	Public
Partners involved inside the consortium	WP2 partners
Partners involved outside the consortium	NA
How the KER will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	Publications.

Status of IPR (if applicable)	NA
TRL before the project	NA
TRL after the project	NA

2.1.4 Set of KPIs for OneNet

Name:	Set of KPIs for OneNet
Description	The KPIs are a meaningful tool to evaluate the performance of specific solutions implemented within a project use case. The KPIs have to be meaningful, understandable, and quantifiable. The KPIs have to give quantitative information to assess the achieved performances; the corresponding values have to be comparable to reference values. The KPIs defined in the OneNet project cover demonstrators' Business Use Cases (BUCs), demonstrators' System Use Cases (SUCs), and OneNet Regional BUCs. These KPIs measure the impact of the innovative solutions proposed and implemented within the OneNet project. These KPIs are employed to assess the cluster demonstrations results, hence the OneNet project impact. For more information please refer to Deliverable D2.4, available in the link below: https://onenet-project.eu/public-deliverables/
Innovativeness introduced compared to already existing Products/Services	The methodology to identify and define the OneNet KPIs represents a step-by-step approach that allows defining harmonised KPIs through a structured, inclusive, and iterative procedure. The process of identification and definition of KPIs allowed to point out a set of challenges mainly related to the peculiarities of the OneNet project in terms of project size, diversity of the demonstration goals and activities, the actual status of development, local demonstrators' characteristics, and the innovative nature of the demonstration activities.
Unique Selling Point USP - Unique Value Proposition UVP	Provides valuable insight on the specific domain.
"Market" – Customers	• System operators • Market operators • Regulators • Scientific community
"Market" - Solution already on the market	Bibliography and publications.
Go to Market – Use model	Publications and dissemination activities.
Time to Market	2023-2024

Open Source (yes/no)	Public
Partners involved inside the consortium	WP2 partners
Partners involved outside the consortium	NA
How the KER will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	Publications.
Status of IPR (if applicable)	NA
TRL before the project	NA
TRL after the project	NA

2.1.5 Methodology for replicability and scalability analysis for OneNet

Name:	Methodology for replicability and scalability analysis for OneNet
Description	The proposed SRA to be used in OneNet is based on the best practices proposed by the BRIDGE task force. The devised SRA relies on six steps: identification of previous relevant EU projects, assessment of the information from selected projects, mapping relevant projects against OneNet demonstrators, identification of the existing gaps and challenges, information gathering from the OneNet partners and stakeholders, formulation of the OneNet SRA results. For more information please refer to Deliverable D2.4 available in the link below: https://onenet-project.eu/public-deliverables/
Innovativeness introduced compared to already existing Products/Services	Scalability and Replicability Analysis methodology devised for the OneNet project based on best practices on the EU level.
Unique Selling Point USP - Unique Value Proposition UVP	Provides valuable insight on the specific domain.
"Market" – Customers	• System operators • Market operators • Regulators • Scientific community
"Market" - Solution already on the market	Bibliography and publications.
Go to Market – Use model	Publications and dissemination activities.
Time to Market	2023-2024
Open Source (yes/no)	Public
Partners involved inside the consortium	WP2 partners

Partners involved outside the consortium	NA
How the KER will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	Publications.
Status of IPR (if applicable)	NA
TRL before the project	NA
TRL after the project	NA

2.1.6 Recommendations for the Harmonised Electricity Role Model

Name:	Recommendations for the Harmonised Electricity Role Model
Description	Presentation of an overall analysis of all the roles and actors proposed for all the use cases presented in the project demos. For more information please refer to Deliverable D2.5, available in the link below: https://onenet-project.eu/public-deliverables/
Innovativeness introduced compared to already existing Products/Services	Analysis presenting the comments from both TSO and DSO point-of-view is presented, to support the continuous improvement of the HRM to integrate more market participants, being aligned with the mandate from European Commission.
Unique Selling Point USP - Unique Value Proposition UVP	Provides valuable insight on the specific domain.
"Market" – Customers	- System operators - Market operators - Regulators - Scientific community - Local/regional/national authorities - EU policy makers
"Market" - Solution already on the market	Bibliography and publications. Harmonized Electricity Role Model.
Go to Market – Use model	Publications and dissemination activities. Public consultations.
Time to Market	2023-2024
Open Source (yes/no)	Public
Partners involved inside the consortium	WP2 partners
Partners involved outside the consortium	

How the KER will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	Publications. Standards.
Status of IPR (if applicable)	NA
TRL before the project	NA
TRL after the project	NA

2.2 WP3: Integrated and coordinated markets for OneNet

KER	Main impact domain
Living Document Market Design	Policy, to a lesser extent Society
Coordinated TSO-DSO Flexibility Market Simulator and Market Clearing Module	Policy, to a lesser extent Commercial

2.2.1 Living Document Market Design

Name:	Living Document Market Design
Description	Policy recommendations how to remove existing barriers to move from markets (energy and flexibility) in isolation to integrated and coordinated markets. ➢ The recommendations are consumer-centric. ➢ The recommendations are in support of the new Framework Guideline on Demand Response/amendment to existing network codes. ➢ The recommendations include 1) a definition what OneNet considers as integrated markets 2) an assessment of existing barriers to achieve integrated markets 3) a set of solution spaces that propose how barriers should be removed. The analysis combines R&D executed in T3.1, T3.2 and T3.4 of OneNet
Innovativeness introduced compared to already existing Products/Services	1) Current analysis and recommendations for TSO-DSO coordination were focusing on the regulated side (i.e. the coordination aspect between system operators- - our recommendations add the perspective of the non-regulated side 2) Recommendations take a European approach using a combination of top research – supported by the largest group of demonstrators – to propose a unified vision (combination of R&D and demonstrators at such a large scale is unique)
Unique Selling Point USP - Unique Value Proposition UVP	The recommendations stem from a very large set of partners and recommendations and are supported by sound modelling (see other WP3 KER for details on the modelling support)
"Market" – Customers	The development will set the stage for additional research in future Horizon Europe projects. In addition, some customers of interest are listed below: • Scientific community • System operators (both TSOs and DSOs).

	• Market operators • Regulators • Local/regional/national authorities and other public bodies • EU policy makers • EU citizen and consumer organisations In particular, this Living Document on Market design should serve as an input for the new Framework Guideline on Demand Response (ACER – EC – TSOs and DSOs).
"Market" - Solution already on the market	Recommendations on market design exist, but the OneNet perspective (R&D meets demonstrators at large scale) is unique
Go to Market – Use model	• Workshops (GRIFOn) – during preparation phase • Public consultation • Workshops for communication results (in coordination with roadmap task) • Living Document – position paper to be published as separate document
Time to Market	2023 - 2024
Open Source (yes/no)	yes
Partners involved inside the consortium	WP3 partners
Partners involved outside the consortium	In terms of customers, we duplicate here the list of potential customers highlighted in the previous "Market – Customers" entry. • System operators (both TSOs and DSOs) • Market operators • Regulators • Scientific community • Local/regional/national authorities and other public bodies • EU policy makers • EU citizen and consumer organisations
How the KER will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	• Publications • New policy
Status of IPR (if applicable)	
TRL before the project	NA
TRL after the project	NA

2.2.2 Coordinated TSO-DSO Flexibility Market Simulator and Market Clearing Module

Name:	Coordinated TSO-DSO Flexibility Market Simulator and Market Clearing Module
Description	TSO-DSO coordinated flexibility market models and clearing mechanisms. 1. Presents several flexibility market models (based on different TSO-DSO coordination schemes, namely: common market, fragmented market, disjoint market, local market, and several multi-level sequential markets) 2. Receives as input: the set of flexibility bids submitted and their technical requirements, the system operators' network representation (e.g., network topology, base generation/load and/or base flows profiles) and the system operator's' flexibility needs 3. Outputs the market clearing results, including: the portion of each bid to be cleared/purchased, resulting market prices, total flexibility procurement costs, updated network state after market clearing, etc. The market clearing mechanism (for each TSO-DSO coordinated market model) ensures the flexibility needs of the system operators are met at the minimum possible cost while abiding by the grid constraints of all the systems involved, as well as the technical constraints of the bids.
Innovativeness introduced compared to already existing Products/Services	Enables the simulation and analysis of different TSO-DSO coordinated market models – based on well-founded optimization models and techniques – which is a novel scope and mechanism (scientifically and in practice). In addition, the developed product can also be used as a market clearing engine itself (when the input data needs and specifications are met)
Unique Selling Point USP - Unique Value Proposition UVP	Enables the analysis of the efficiency of different types of TSO-DSO coordinated market models and this efficiency's sensitivity to a wide range of inputs. The simulator also enables testing the market clearing engine itself for different TSO-DSO coordinated settings. This enables system and market operators to define the most suitable TSO-DSO market design and market clearing model for their particular use case.
"Market" – Customers	The development will set the stage for additional research in future Horizon Europe projects. In addition, some customers of interest are listed below: • Scientific community • System operators (both TSOs and DSOs). • Market operators • Regulators • Local/regional/national authorities and other public bodies • EU policy makers • EU citizen and consumer organisations
"Market" - Solution already on the market	Market simulators (as far as we know, none of them offer TSO-DSO coordinated flexibility market models – where available simulators primary focus on wholesale and ancillary services markets). However, market exploration would be conducted once the product gains additional maturity. The main scope at the moment has been scientific development, proof of concept, and validation through testing on different use cases.

Go to Market – Use model	1. Scientific publications. The development here will also set the stage for additional research and development in future research projects.
	2. Showcase the functionality to potential customers through workshops, public deliverables, and position and scientific papers.
	3. Receive feedback on perceived value followed by an adaptation to the functionality
	4. Improve the functionality based on received feedback and move forward from the current research stage to a more mature product development stage (which can potentially deliver value directly to the customers – beyond the scientific community)
Time to Market	Pending received feedback. However, scientific value is being disseminated already through scientific publications in renowned international journals.
	Current development is within the research and development stage, but the process is gaining additional maturity as part of the development process (including model/methodological developments as well as IT developments)
Open Source (yes/no)	no
Partners involved inside the consortium	VITO
Partners involved outside the consortium	• No other partners outside of VITO are involved in the development. • In terms of customers, we duplicate here the list of potential customers highlighted in the previous "Market – Customers" entry. o System operators (both TSOs and DSOs) o Market operators o Regulators o Scientific community o Local/regional/national authorities and other public bodies o EU policy makers o EU citizen and consumer organisations
How the KER will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	• Publications • New service • License agreement • Direct industrial use
Status of IPR (if applicable)	
TRL before the project	TRL 3-4
TRL after the project	TRL 4-5

2.3   WP4: Integrated System Operation for OneNet

KER	Main impact domain
WP4 methodology for the integration of previous project results	Policy

2.3.1   WP4 methodology for the integration of previous project results

Name:	WP4 methodology for the integration of previous project results
Description	A methodology for the analysis of previous projects and current conditions to build up results based on the outcomes of the past projects and integrating at the same time the outcomes of the new projects. The aim of this methodology is also to enable the interoperability of flexibility assets by integrating and consolidating the lessons learned from international projects, use cases, maintaining a set of recommendations, and best practices.
Innovativeness introduced compared to already existing Products/Services	Based on the BRIDGE methodology
Unique Selling Point USP - Unique Value Proposition UVP	
"Market" – Customers	Further projects dealing with data exchange and GBP
"Market" - Solution already on the market	BRIDGE initiative
Go to Market – Use model	1. Scientific publications. The development here will also set the stage for additional research and development in future research projects. 2. Project work: Analysis of data exchange and GBP.
Time to Market	Can be applied right away, as it is published in the public deliverable D4.1. It will be also presented in a scientific publication.
Open Source (yes/no)	yes
Partners involved inside the consortium	E-REDES, Comillas, RWTH, ENTSO-E, EDSO, EPRI, ENG, UBE, ED, VITO.
Partners involved outside the consortium	No other partners outside the consortium are involved in the development. I
How the KER will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	• Publications • Future projects

Status of IPR (if applicable)	
TRL before the project	NA
TRL after the project	NA

2.4 WP5: Open IT Architecture for OneNet & WP6: Reference IT Implementation for OneNet

KER	Main impact domain
OneNet Connector (incl. interfaces & GUI)	Commercial
Cross-Platform-Services Catalogue	Policy / Commercial
Orchestration Workbench	Commercial
Data Governance Model	Policy
Tools for Legal, Regulatory, Privacy and Cybersecurity Compliance	Commercial

2.4.1 OneNet Connector

Name:	OneNet Connector
Description	The OneNet Connector, based on TRUE Connector, combines the International Data Spaces principles with the advantages of the FIWARE ecosystem ensuring a seamless and secure data exchange in a completely end-to-end, domain-agnostic decentralized approach. The OneNet Connector is a software component which can be downloaded from: https://github.com/european-dynamics-rnd/OneNet The OneNet Connector can easily be deployed and integrated with any platform through a comprehensible REST API interface. It offers a clear, user-friendly functionality (both through the REST API and/or the GUI) enabling users and platforms to exchange data. In addition, the OneNet Connector offers a pre-defined, dynamically evolving list of Cross Platform Services Catalogue, with Business Objects and corresponding Data Profiles providing to the whole system semantic and data interoperability. Available Documentation: https://onenet-project.eu/wp-content/uploads/2023/02/D6.1-OneNet-v1.0.pdf
Innovativeness introduced compared to already existing Products/Services	• IDSA RAM Compliance • FIWARE Integration • Enables interoperability among all domain stakeholders • Cross-domain interoperability • Decentralization

Unique Selling Point USP - Unique Value Proposition UVP	Expands the possibility of transactions with "external" platforms and services with low effort
"Market" – Customers	Major stakeholders of the Electricity domain (including TSO/DSOs, Aggregators, FSPs, Market Operators etc.)
"Market" - Solution already on the market	Limited IT systems with islanding operation in terms of flexibility services.
Go to Market – Use model	Market access through the provision of IT services and/or IT systems integration for major stakeholders (i.e. TSO/DSO) or federated organisations.
Time to Market	1-3 years
Open Source (yes/no)	Yes
Partners involved inside the consortium	ED, ENG
Partners involved outside the consortium	None
How the KER will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	• New product/service • Licensing agreement (through open license)
Status of IPR (if applicable)	As per Open License (ENG on TRUE Connector, ENG and ED on OneNet Connector)
TRL before the project	4
TRL after the project	8

2.4.2 Cross-Platform-Services Catalogue

Name:	Cross-Platform-Services Catalogue
Description	A methodology and tool to define and describe Cross-Platform-Services in the electricity domain with their underlying Business Objects, enabling the harmonised data exchange between different platforms and actors. The Tool is embedded currently in the OneNet Connector as a separate module (see Ch. 2.4.1 above). The OneNet Connector is a software component which can be downloaded from: https://github.com/european-dynamics-rnd/OneNet.
Innovativeness introduced compared to already existing Products/Services	• Harmonized structure • Cross-platform services definition & management • Platform independent • Integration with the OneNet Connector

	• Open Architecture
Unique Selling Point USP - Unique Value Proposition UVP	Simplification of process, data and effort for cross-platform communication and management of cross-platform services.
"Market" – Customers	Major stakeholders of the Electricity domain (including TSO/DSOs, Aggregators, FSPs, Market Operators etc.)
"Market" - Solution already on the market	Limited IT systems with islanding operation in terms of flexibility services.
Go to Market – Use model	Market access through the provision of IT services and/or IT systems integration for major stakeholders (i.e. TSO/DSO) or federated organisations.
Time to Market	1-2 years
Open Source (yes/no)	Yes
Partners involved inside the consortium	ED, ENG
Partners involved outside the consortium	None
How the KER will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	• New product/service • Licensing agreement (through open license)
Status of IPR (if applicable)	As per Open License
TRL before the project	2
TRL after the project	8

2.4.3 Orchestration Workbench

Name:	Orchestration Workbench
Description	OneNet Orchestration Workbench is a software component able to orchestrate and evaluate the performance and scalability of the cross-platform services that will be integrated and implemented in the OneNet System. Any OneNet participant will be able to test and evaluate its own service exploiting the OneNet Orchestration Workbench, that allows to integrate data coming from the OneNet Middleware and to implement a data pipeline orchestration. A test environment of the OneNet Orchestration Workbench is available on ENG cloud environment at the following URL: http://smart-energy.eng.it

Innovativeness introduced compared to already existing Products/Services	Microservices orchestration platform, integrated with the Energy Data Space concept enabled from OneNet project.
Unique Selling Point USP - Unique Value Proposition UVP	Simplification of process, data and effort for cross-platform communication
"Market" – Customers	Service Provider, Energy Stakeholder
"Market" - Solution already on the market	Already existing solution are not integrated with the concept of Data Space,
Go to Market – Use model	The solution is partially based on the LFE Open source SOGNO Platform. The Orchestration Workbench will be released with an open-source license too. ENG plans to maintain as its own internal solution and offer to the user in a Platform-as-a-service model.
Time to Market	1-3 years
Open Source (yes/no)	Yes
Partners involved inside the consortium	ENG
Partners involved outside the consortium	No
How the KER will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	New product/service
Status of IPR (if applicable)	
TRL before the project	5
TRL after the project	7

2.4.4 Reference Data Governance Model

Name:	Reference Data Governance Model
Description	The Reference Data Governance Model (based on literature review, OneNet data exchange framework and survey results) consists of a number of governance elements and requirements. It complements the European Data Exchange Reference Architecture proposed by BRIDGE Initiative. It is reported in OneNet Deliverable 6.2.

Innovativeness introduced compared to already existing Products/Services	Reference Data Governance Model is expected to contribute to European data exchange interoperability. Actions have been already taken through the channels like BRIDGE Initiative's Data Management Working Group, Expert Group 1 of Smart Grids Task Force (dealing with data interoperability implementing acts), relevant groups of ENTSO-E.
Unique Selling Point USP - Unique Value Proposition UVP	It supports European wide cross-border and cross-sector data exchange interoperability. Governance is the key for European common data spaces.
"Market" – Customers	1. EU and national policy makers 2. ICT sector 3. Data intermediaries 4. Data providers and consumers
"Market" - Solution already on the market	Some other European initiatives are working towards common data space, e.g. GAIA-X, IDSA, OPEN DEI, Horizon Europe projects. The Reference Data Governance Model proposed by OneNet intends to focus on and complement other initiatives with governance aspects in a comprehensive manner.
Go to Market – Use model	The policy makers and stakeholders will be reached through contribution in initiatives like BRIDGE and Smart Grid Task Force. Also, ENTSO-E and EU DSO Entity are expected to promote the results.
Time to Market	2023
Open Source (yes/no)	NA
Partners involved inside the consortium	Elering, European Dynamics, Engineering, E-REDES
Partners involved outside the consortium	• scientific community • RES generators and technology providers • potential end-users • EU policy makers • standardisation/regulation bodies
How the KER will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	Reference Data Governance Model is intended to be the additional layer to BRIDGE Initiative's Data Exchange Reference Architecture (DERA) and as such contribute to Common Energy Data Space discussions and developments.
Status of IPR (if applicable)	Public
TRL before the project	NA
TRL after the project	NA

2.4.5 Tools for Legal, Regulatory, Privacy and Cybersecurity Compliance

Name:	Tools for Legal, Regulatory, Privacy and Cybersecurity Compliance
Description	The legal, regulatory, privacy and cybersecurity compliance tools provide continuous monitoring of the source traffic/logs/events that come through the system under consideration, to assist on the cyber-security preservation aspects. Malicious network activity and system vulnerabilities can be identified and used for the update and enhancement of the data access policies. Also, these tools are responsible for network traffic classification or clustering based on the machine learning algorithm used (supervised or unsupervised). The algorithm extracts useful features around the data traffic such as basic features (source/destination IP address, source/destination host port, frame length), time-based features (number of frames received in a specific time interval), connection-based features (number of packets flowing from source to destination and vice versa) and classification of traffic as normal or abnormal. The software is available on the link below: https://dashboard-eu-onenet.euprojects.net/auth/login The full description of the tolls will be reported in deliverable D6.6.
Innovativeness introduced compared to already existing Products/Services	Innovative machine learning algorithms
Unique Selling Point USP - Unique Value Proposition UVP	The customer will be able to monitor and safeguard the system under consideration.
"Market" – Customers	• Transmission System Operators • Distribution System Operators • Generation utilities/RES generators/BSPs • Large-scale consumers • Technology providers • Manufacturers/3rd party interconnector developers • Market operators • Market platforms • Local/regional/national authorities and other public bodies • RSCs
"Market" - Solution already on the market	Baskerville For more information, please visit the link below: https://github.com/deflect-ca/baskerville
Go to Market – Use model	Channel to reach the identified customers: • Existing contacts & established relationships with potential customers (also from their participation in similar EU-projects) • Promotion through webinars & internet campaigns (after the end of the project)

	Resources needed for going to the market:
	• Marketing personnel
	• Marketing campaign budget
	• Technical support facility
Time to Market	1 year
Open Source (yes/no)	yes
Partners involved inside the consortium	UBITECH, UBITECH ENERGY
Partners involved outside the consortium	None
How the KER will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	New product/service
Status of IPR (if applicable)	
TRL before the project	4
TRL after the project	7

2.5 Western Cluster

KER	Main impact domain
STAR blockchain Platform	Technical and commercial
Study on coordination models	Technical
OMIE Local market platform (LMP) – Short-term	Technical and societal
OMIE Local market platform (LMP) – Long-term	Technical and societal
DSO and TSO Data Exchange Platform (DDEP & TDEP)	Technical
Methodology for the estimation of flexibility potential from MV clients	Technical and societal
TSO Flexibility Needs Evaluation and FSP flexibility provision simulation Tool	Technical
Short-Circuit levels forecast Tool in TSO-DSO substations	Technical

2.5.1 STAR blockchain Platform

Name:	STAR blockchain Platform

Description	The STAR system is a monitoring platform (OneNet D9.4 deliverable – Validation & result of concept test and D9.7 - Demo result assessment & data report collection) that allows sharing relevant information for the settlement but not directly undertaking it. It aims to build a shared ledger, through blockchain technology, to simplify and optimize the management of renewable production curtailments by covering the entire life cycle of a flexibility offer, from trackability of the curtailment to the compensation of the curtailment.
Innovativeness introduced compared to already existing Products/Services	Blockchain technology
Unique Selling Point USP - Unique Value Proposition UVP	The added value of this demonstration is for TSO, DSO, and producer with the set-up of a new process of compensation of curtailment activation.
"Market" – Customers	TSO, DSO, Producer
"Market" - Solution already on the market	NA
Go to Market – Use model	The compensation process for curtailment process will be industrialized. The technology used will be defined at the end of the demonstration depending on the demo's result.
Time to Market	STAR platform is only running in the experimental phase and will not be industrialised.
Open Source (yes/no)	yes
Partners involved inside the consortium	RTE, Enedis
Partners involved outside the consortium	• DSOs, TSOs (in the consortium) • RES generators
How the KER will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	New Technology (blockchain)
Status of IPR (if applicable)	NA
TRL before the project	TRL4 – technology (blockchain in our use case) validated in lab
TRL after the project	TRL5 – technology (blockchain on our use case) validated or not in relevant environment (industrially relevant environment in case of key enabling technologies)

2.5.2 Study on coordination models

Name:	Study on coordination models. This study is included in OneNet Deliverable D9.4 - OneNet D9.4 deliverable – Validation & result of concept test
Description	The French demonstration will study innovative ways of TSO-DSO information exchange in the context of DER activation. The so-called "shared information TSO-DSO congestion management in case of activation of distributed flexibility" aims to study the future needs in flexibility and their usage both for RTE and Enedis and analyze what coordination issues could arise consequently.
Innovativeness introduced compared to already existing Products/Services	
Unique Selling Point USP - Unique Value Proposition UVP	
"Market" – Customers	TSO - DSO
"Market" - Solution already on the market	
Go to Market – Use model	--
Time to Market	NA
Open Source (yes/no)	NA
Partners involved inside the consortium	RTE, Enedis
Partners involved outside the consortium	
How the KER will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	Starting point from possible future collaboration
Status of IPR (if applicable)	
TRL before the project	NA
TRL after the project	NA.

2.5.3 OMIE Local market platform (LMP) – Short-term

Name:	OMIE Local market platform (LMP) – Short-term
Description	The short-term local market platform is the system responsible for receiving the unexpected or short-term programmed DSO needs on market sessions for flexibility procurement, the bids from FSPs, the market clearing and for the communication of short-term market results to different stakeholders. It is further described in OneNet deliverable D9.3 and in D5.1, Chapter 10.3.2 Spanish demo SUC, Local Platform at https://onenet-project.eu/public-deliverables/.
Innovativeness introduced compared to already existing Products/Services	Applies the EC Directive 944/2019 Article 32 — "Incentives for the use of flexibility in distribution networks"
Unique Selling Point USP - Unique Value Proposition UVP	The platform will allow: (i) DSOs to request flexibility to manage day ahead or intraday congestion problems, and (ii) consumers to maximize the economic performance of the DERs at its disposal (e.g. PV, batteries, etc.).
"Market" – Customers	• DSO • FSPs / Market agents with DERs • Aggregators • Electric Vehicle • Energy Communities • Demand Response (industrial, residential, final active consumers…) • Storage owners • Distributed generators
"Market" - Solution already on the market	NA (lack of regulation)
Go to Market – Use model	Channel to reach the identified customers: • Spanish electricity market regulation Resources needed for going to the market: • Spanish electricity market regulation Target: Flexible resources capable of responding DSOs needs.
Time to Market	Intraday or day ahead.
Open Source (yes/no)	No
Partners involved inside the consortium	OMIE, IDE, UFD, COMILLAS
Partners involved outside the consortium	• I-DE consumers (households, businesses, industry) • UFD consumers (households, businesses, industry)
How the KER will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology	To promote new policy recommendation to integrate a new local flexibility market in Spain.

transfer, license agreement, publications, standards, etc.)	
Status of IPR (if applicable)	
TRL before the project	2
TRL after the project	5/6

2.5.4 OMIE Local market platform (LMP) – Long-term

Name:	OMIE Local market platform (LMP) – Long-term
Description	The long-term local market platform is the system responsible for receiving the future DSO scheduled needs on market sessions for flexibility procurement, the bids from FSPs, the market clearing and for the communication of long-term market results to different stakeholders. It is further described in OneNet deliverable D9.3 at https://onenet-project.eu/public-deliverables/.
Innovativeness introduced compared to already existing Products/Services	Applies the EC Directive 944/2019 Article 32 — "Incentives for the use of flexibility in distribution networks"
Unique Selling Point USP - Unique Value Proposition UVP	The platform will allow: (i) DSOs to request flexibility to manage congestions in the long term with the DERs connected to it, avoiding in some cases investments in network expansion, and (ii) consumers flexibility registration and to maximize the economic performance of the DERs at its disposal (e.g. PV, batteries, etc.).
"Market" – Customers	• DSO • FSPs / Market agents with Ders • Aggregators • Electric Vehicle • Energy Communities • Demand Response (industrial, residential, final active consumers…) • Storage owners • Distributed generators
"Market" - Solution already on the market	NA (lack of regulation)
Go to Market – Use model	Channel to reach the identified customers: • Spanish electricity market regulation Resources needed for going to the market: • Spanish electricity market regulation
Time to Market	Years, months, weeks, days ahead of need
Open Source (yes/no)	No
Partners involved inside the consortium	OMIE, IDE, UFD, COMILLAS

Partners involved outside the consortium	• I-DE consumers (households, businesses, industry) • UFD consumers (households, businesses, industry)
How the KER will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	To promote new policy recommendation to integrate a new local flexibility market in Spain.
Status of IPR (if applicable)	
TRL before the project	2
TRL after the project	5/6

2.5.5 DSO and TSO Data Exchange Platform (DDEP & TDEP)

Name:	DSO and TSO Data Exchange Platform (DDEP & TDEP)
Description	Cloud system that will serve as a gateway between the internal systems of the DSO and the TSO with other possible external entities. This cloud system serves the necessary IT infrastructure (e.g. servers and databases) to deploy the developed software components, thus being capable of fulfilling the use cases and required APIs, through modules and information exchange mechanisms within a cloud environment. The DDEP relies on Azure cloud services, while TDEP is deployed on an AWS cloud service. Each system is separated in two main layers: communication (API Middleware and Developer Portal) and operational (flexibility module, operational module and data storage).
Innovativeness introduced compared to already existing Products/Services	It will allow a seamless information exchange between DSOs and TSOs, closer to real-time operation of the system.
Unique Selling Point USP - Unique Value Proposition UVP	Increased efficiency in the management and operation of the grid, and a more efficient use of the flexible resources.
"Market" – Customers	DSOs, TSOs
"Market" - Solution already on the market	The use of API based solutions are common and thoroughly used to other purpose data exchange. For the interactions between the DSO and TSO for operational planning purposes, the exchange is essentially done through e-mail or SFTP, with lower frequency and scope of data, so the use of APIs for this purpose and under these characteristics is still not a fully deployed and marketed solution.

Go to Market – Use model	Both the architecture, the schemas and API specifications will be disseminated through the project Deliverable 9.2 – not yet published at the time of writing this document. The source code of the platforms, excluding some parts of the API code, will also be made open source, in a web location to be defined, to allow replicability. As for exploitation, after the demonstration and testing, its use in the daily activities of the DSO and TSO will be assessed.
Time to Market	After the testing of the solution (End of 2023) within the Portuguese demonstration, its use and roll-out for daily use by the system operators will be assessed, so at this stage, no specific time to market has been defined.
Open Source (yes/no)	No. The platform itself won't, but as mentioned above majority of the source code will be.
Partners involved inside the consortium	E-REDES, R&D NESTER, REN
Partners involved outside the consortium	Platform developers: Link Consulting and Watt-IS
How the KER will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	To serve as best practice/technology transfer for other SOs.
Status of IPR (if applicable)	NA
TRL before the project	6
TRL after the project	8

2.5.6 Methodology for the estimation of flexibility potential from MV clients

Name:	Methodology for the estimation of flexibility potential from MV clients
Description	Methodology to estimate the flexibility potential from MV clients that responded to a consumer survey launched. The methodology is explained in D9.2. The MV clients considered will a significant group of supermarkets from a national supermarket chain (Continente), and the analysis will follow the steps: - Clusters formation methodology and results - Load modeling and constraints - Flexibility estimation and uncertainty evaluation
Innovativeness introduced compared to already existing Products/Services	Not a product/service, it's the methodology we have used to support the UC simulations. Two innovative aspects: 1) Event driven load estimation; 2) Uncertainty inclusion in the simulations.

Unique Selling Point USP - Unique Value Proposition UVP	The generic consumer will be able to understand what the potential of the estimated flexibility is, and what are the considerations in terms of infrastructure to actually achieve the provision.
"Market" – Customers	• Portuguese large electricity consumers connected to the DSO. • Portuguese large electricity consumers connected to the TSO. • Other research organisations planning to replicate the methodology. • Aggregators planning to operate in Portugal.
"Market" - Solution already on the market	There are event driven methodologies for load identification/disaggregation.
Go to Market – Use model	• As a dissemination channel, a workshop will be promoted to explain flexibility and the estimation methodology. Moreover, public project deliverables from WP9 will be made available. • No resource to go to market are foreseen as it is not a market service/tool but a methodology.
Time to Market	NA. It isn't a product or a service, it's a methodology to estimate the flexibility potential that is ready to use and is replicable.
Open Source (yes/no)	Yes.
Partners involved inside the consortium	InescTec, E-REDES, R&D NESTER, REN
Partners involved outside the consortium	Consumers (households, businesses, industry) were necessary to obtain permission to use their data. Consumers were reached through a survey.
How the KER will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	Other willing research organisations may want to replicate the methodology we are considering in our simulations.
Status of IPR (if applicable)	NA
TRL before the project	NA
TRL after the project	NA

2.5.7 TSO Flexibility Needs Evaluation and FSP flexibility provision simulation Tool

Name:	TSO Flexibility Needs Evaluation and FSP flexibility provision simulation Tool [PT Demo]
Description	The tool is composed of 2 modules: one that computes the TSO nodal flexibility needs in the TSO/DSO transformers (EHV/HV) and another that provides the

	FSPs optimal dispatch to solve the TSO flexibility needs. The tool can be used for single or multi-period studies and can run a stochastic analysis.
Innovativeness introduced compared to already existing Products/Services	The stochastic multi-period OPF framework included in the tool is an innovative solution, that allows the TSOs to identify the grid flexibility needs profile taking into considerations different levels of demand uncertainty as input.
Unique Selling Point USP - Unique Value Proposition UVP	In the OneNet deliverables 9.2 and 9.5, the tool will be presented as well as the methodology behind it. For now, the tool will not be provided (delivered, experienced or acquired) publicly. However, the Portuguese TSO (REN) will test it and try to integrate it in their usual operational planning procedures (if the testing phase is successful).
"Market" – Customers	TSOs
"Market" - Solution already on the market	NA
Go to Market – Use model	In the OneNet deliverables 9.2 and 9.5, the tool will be presented as well as the methodology behind it. The goal is also to build on top of this tool some new features that can fit in some future EC calls scope. When it reaches a stage of maturity ready for market deployment the commercialization as SaaS is one hypothesis under analysis.
Time to Market	NA
Open Source (yes/no)	No
Partners involved inside the consortium	R&D NESTER
Partners involved outside the consortium	NA
How the KER will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	New Product/Service and technology transfer
Status of IPR (if applicable)	Working on an application for patent
TRL before the project	4
TRL after the project	6-7

2.5.8 Short-Circuit current forecast Tool in TSO-DSO substations

Name:	Short-Circuit current forecast Tool in TSO-DSO substations

Description	The tool computes day-ahead three-phase short-circuit levels for the 63kV bus bars that are the interconnection TSO/DSO transformers (EHV/HV). It uses the grid data and forecasted generation/load profiles known after the wholesale market results.
Innovativeness introduced compared to already existing Products/Services	It gives to the TSOs and DSOs the opportunity to get day-ahead short-circuit forecast in order to improve operation planning activities. Nowadays, the Portuguese SOs do not track the short-circuit currents in the day-ahead timeframe, so, having this tool would be a novelty in their processes.
Unique Selling Point USP - Unique Value Proposition UVP	In the OneNet deliverables 9.2 and 9.5, the tool will be presented as well as the methodology behind it. For now, the tool will not be provided (delivered, experienced or acquired) publicly. However, the Portuguese TSO (REN) and DSO (E-REDES) will test it and try to integrate it in their usual operational planning procedures (if the testing phase is successful).
"Market" – Customers	TSOs and DSOs. To use the tool the customers (i.e. TSOs and DSOs) need to provide the network data and short-circuit parameters as input.
"Market" - Solution already on the market	NA
Go to Market – Use model	In the OneNet deliverables 9.2 and 9.5, the tool will be presented as well as the methodology behind it. The goal is also to build on top of this tool some new features that can fit in some future EC calls scope. When it reaches a stage of maturity ready for market deployment the commercialization as SaaS is one hypothesis under analysis.
Time to Market	NA
Open Source (yes/no)	No
Partners involved inside the consortium	R&D NESTER and E-REDES
Partners involved outside the consortium	NA
How the KER will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	New Product/Service and technology transfer.
Status of IPR (if applicable)	NA
TRL before the project	4
TRL after the project	6/7

2.6 Eastern Cluster, Slovenia

KER	Main impact domain
Flexibility Market Platform	Commercial, Policy
Module for automated activations	Commercial

2.6.1 Flexibility Market Platform

Name:	Flexibility Market Platform
Description	Flexibility market platform enables DSOs to procure and activate flexibility services to tackle distribution grid limitations (congestion management, voltage control). Flexibility platform extends national data hub with the functionalities to trade with the flexibility products for DSO purposes. It enables prequalification of consumers and aggregators as flexibility service providers, announcing open tenders, conducting auctions, transfers activation signals from DSO to FSP, billing and evaluation of activation responses.
Innovativeness introduced compared to already existing Products/Services	This platform is opening the market for new products -> very innovative since it has not been done before in SLO
Unique Selling Point USP - Unique Value Proposition UVP	This platform enables customer to participate in markets that were off reach before
"Market" – Customers	- DSOs - Aggregators - Households with batteries - Households with PVs - Households with heat pumps - Commercial and industry consumers with flexibility (not used in SI demo)
"Market" - Solution already on the market	None in SLO
Go to Market – Use model	Public campaign, National metering data hub extended with functionalities to offer, sell and activate flexibility products aimed for end customers as well as for aggregators.
Time to Market	End of 2023
Open Source (yes/no)	No
Partners involved inside the consortium	Gen-I, EIMV, Elektro Ljubljana, ELES, Elektro Gorenjska, Elektro Celje
Partners involved outside the consortium	- DSOs, TSOs, energy communities and cooperatives - RES generators and technology providers - potential end-users - consumers (households, businesses, industry) - Local/regional/national authorities and other public bodies

	• EU policy makers • standardisation/regulation bodies • general public • Consumers • journalists and the media • EU citizen and consumer organisations
How the KER will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	New product/service
Status of IPR (if applicable)	No
TRL before the project	Ready to use, TRL 7
TRL after the project	Developed, TRL 8

2.6.2 Module for automated activations

Name:	Module for automated activations enables scalability of flexibility projects
Description	Mechanism of activations reflect good practices from TSOs on the mFRR market -> not innovative, just transmitting working approaches to new markets
Innovativeness introduced compared to already existing Products/Services	This module uses IoT concept and expands scalability of locations. With this module, flexibility services are automatically activated using standard CIM XML documents instead of manual activations (manual requests over telephone). This innovation increases reliability of service, reduces response time and enables higher scalability (handling a large number of flexibility assets simultaneously).
Unique Selling Point USP - Unique Value Proposition UVP	
"Market" – Customers	DSOs, end customers and aggregators
"Market" - Solution already on the market	None in SLO
Go to Market – Use model	DSO announcement pages
Time to Market	End of 2022
Open Source (yes/no)	No
Partners involved inside the consortium	• Gen-I, EIMV, Elektro Ljubljana, ELES, Elektro Gorenjska, Elektro Celje

Partners involved outside the consortium	• DSOs, TSOs, energy communities and cooperatives • Local/regional/national authorities and other public bodies • EU policy makers • standardisation/regulation bodies;
How the KER will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	Direct industrial use
Status of IPR (if applicable)	No
TRL before the project	TRL 6
TRL after the project	TRL 7

2.7 Eastern Cluster, Poland

KER	Main impact domain
Flexibility Market Platform (atFlex Platform)	Commercial/Policy
TSO-DSO coordination algorithms	Commercial/Policy

2.7.1 Flexibility Market Platform

Name:	atFlex Platform
Description	Web application[3], which simulates flexibility market and allows to bid to cover needs for congestion management, voltage control and balancing market with Day-ahead approach.
Innovativeness introduced compared to already existing Products/Services	Allowance to bid on congestion management, voltage control and balancing market simultaneously and with coordination between DSO and TSO.
Unique Selling Point USP - Unique Value Proposition UVP	Platform provides coordination schemes between DSO and TSO so as to fully use flexibility potential available on the market. It is first of its kind in the Polish market, due to lack of any ordinances in Polish law regarding the usage of flexibility potentials in the power system.
"Market" – Customers	DSO TSO

---

[3] https://atflex-onenet.tt-cloud.com.pl/login

	Flexibility market owner Balancing groups
"Market" - Solution already on the market	
Go to Market – Use model	DSO or TSO starting flexibility market on the national policy level
Time to Market	
Open Source (yes/no)	Yes - Transition-Technologies-Systems (github.com)
Partners involved inside the consortium	TTST, PSE, EOP, Enspirion, NCBJ
Partners involved outside the consortium	Flexibility service providers
How the KER will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	License agreement, new policy, new standard, direct industrial use, publications.
Status of IPR (if applicable)	
TRL before the project	TRL2
TRL after the project	TRL7

2.7.2 TSO-DSO coordination algorithms

Name:	TSO-DSO coordination algorithms
Description	The offers are filtered (and combined) by the TSO-DSO coordination algorithms in order to ensure a secure procurement of the DERs in the DSO network by the balancing market. The description of the algorithm and the solution will be in D10.4. The algorithm is developed as a software solution and a part of the Polish demo market platform.
Innovativeness introduced compared to already existing Products/Services	Automatized algorithm that considers the most updated information of the DSO network offers and FSP offers
Unique Selling Point USP - Unique Value Proposition UVP	The algorithms allow the balancing market to access cheaper resources from the DSO network without endangering the DSO network. However, it might be applied in the internal DSO systems as a way to automatically perform dynamic grid impact assessment.

"Market" – Customers	Flexibility market owner
	DSOs
	TSOs
"Market" - Solution already on the market	Static grid impact assessment by the DSO, which is currently not enough. And therefore, creating a lot of DER curtailments when the DSO network is endangered.
Go to Market – Use model	To extend the cooperation with the partners of the Polish DEMO in order to deliver the solution in reality. Open for other cooperation of other partners.
	The dissemination of the project may play a key role on obtaining more partners involved.
Time to Market	Depending on the results of the DEMO, it will be considered to develop it further or to apply it directly in the market in the mid-term horizon. There are several market options for the algorithms: as a part of the flexibility platform (as in the DEMO) or as an internal part of the DSO dynamic grid assessment. The first application depends on the evolution of the regulation and flexibility markets in Poland.
Open Source (yes/no)	No
Partners involved inside the consortium	NCBJ, PSE
Partners involved outside the consortium	
How the KER will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	License agreement, new policy, new standard, direct industrial use, publications.
Status of IPR (if applicable)	
TRL before the project	2
TRL after the project	7

2.8 Eastern Cluster, Czechia

KER	Main impact domain
Network traffic light system	Commercial
Non-frequency ancillary services market platform	Commercial
Flexibility register	Commercial

2.8.1 Network traffic light system

Name:	Network traffic light system
Description	The network traffic light enables the DSOs to signal aggregators and flexibility providers whether they are/will be able or not to provide flexibility at a particular point in time. The solution also provides additional information from aggregators and FSPs to DSO regarding amount of contracted services and cleared bids before real activation. Both solutions (traffic light system and platform – see the section below) are based on flexibility register, which contains list of FSP units and several additional information about each unit (installed capacity, ID code, aggregation block, etc.). Details on the Czech demo including the traffic light system is provided in the deliverable 10.1 "Report on Customer Engagement".
Innovativeness introduced compared to already existing Products/Services	So far there has not been a central point that provides up to date information on network outages – in terms of data access and clarity, it is a substantial improvement of the market environment for all participants. As far as the new market platform is concerned, it is supposed to provide know-how and insight into how the new market for non-frequency flexibility can be organized.
Unique Selling Point USP - Unique Value Proposition UVP	Since the traffic light scheme is "operational" now, we expect measurable benefits for market participants (aggregators) in terms of more clarity considering duration and scope of outages so they can better organize their business activities. It will also decrease administrative burden for all parties.
"Market" – Customers	Aggregators, DSOs and TSOs
"Market" - Solution already on the market	Prior to the project there was no dedicated solution available.
Go to Market – Use model	As discussed above, the traffic light scheme developed as part of the project is now implemented and in regular operation in the Czech Republic.
Time to Market	See answer below about KER
Open Source (yes/no)	yes
Partners involved inside the consortium	There is substantial involvement of IT provider Unicorn, SOs (system operators) were engaged in design and testing of the whole solution
Partners involved outside the consortium	All debated solutions will contribute for better interaction between SOs (TSO and DSO) and new market participants – i.e. aggregators.
How the KER will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	The traffic light scheme has already been implemented as a nationwide solution through a new policy. It has become mandatory for all generators and consumers of 0,5MW or above as of January 2022. –The solution also introduced appropriate data exchange standards allowing clear communication of important grid events (outages/planned outages) to relevant parties. In the future it will also become part of new Energy Law as a regular policy. Lessons learned from market platform design will be used in business specification for a new robust central national system for data exchange, currently in preparation in CZ.

Status of IPR (if applicable)	NA
TRL before the project	5
TRL after the project	8

2.8.2 Non-frequency ancillary services market platform

Name:	Non-frequency ancillary services platform prototype
Description	The market platform allows multilateral interaction allowing flexibility offer/procurement at one centralized marketplace encompassing both active and reactive based flexibility/products.
Innovativeness introduced compared to already existing Products/Services	As far as the new market platform is concerned, it is supposed to provide know-how and insight into how the new market for non-frequency flexibility can be organized.
Unique Selling Point USP - Unique Value Proposition UVP	There is a general assumption, that the platform will help aggregators to generate more profit through enabling access to new markets with non-frequency services . However as this is only prototype (unlike the traffic light scheme) exact benefit cannot be calculated.
"Market" – Customers	Aggregators, DSOs and TSOs
"Market" - Solution already on the market	Prior to the project there was no dedicated solution available.
Go to Market – Use model	The exercise on new markets for non-frequency flexibility will provide an insight into how the future market might work. This system (country-wide solution) is now in preparation.
Time to Market	See answer below about KER
Open Source (yes/no)	yes
Partners involved inside the consortium	There is substantial involvement of IT provider Unicorn, SOs (system operators) were engaged in design and testing of the whole solution.
Partners involved outside the consortium	No
How the KER will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	Lessons learned from market platform design will be used in business specification for new robust central national system for data exchange, currently in preparation in CZ.
Status of IPR (if applicable)	NA

TRL before the project	1
TRL after the project	6

2.9 Eastern Cluster, Hungary

KER	Main impact domain
TSO-DSO coordination	Policy
FSP accreditation methodology (Flexibility Register)	Policy

2.9.1 TSO-DSO coordination

Name:	TSO-DSO coordination
Description	Coordination method of asset information between TSO and DSO's. The goal is to offer a traffic light scheme between the Hungarian TSO and DSOs that coordinates the participation of assets on the DSO's non-frequency-based flexibility market and the TSO's balancing market. The coordination involves the design of the traffic light scheme and the communication between the participants.
Innovativeness introduced compared to already existing Products/Services	Since the DSO flexibility platform is the first of its kind in Hungary, the TSO-DSO information exchange regarding the asset information is an utterly new concept on the Hungarian market.
Unique Selling Point USP - Unique Value Proposition UVP	This tool allows the parallel market operations for DSOs and the TSO and ensures the security of supply.
"Market" – Customers	TSO, DSOs, FSPs
"Market" - Solution already on the market	There is no such solution on the (Hungarian) market
Go to Market – Use model	The TSO – DSO coordination method will be included in the respective network codes.
Time to Market	It is implemented in the network codes
Open Source (yes/no)	NA
Partners involved inside the consortium	TSO, DSOs, University (E.ON, MVM, MAVIR, BME)
Partners involved outside the consortium	None
How the KER will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license	In the form of new policies in the Network Codes.

agreement, publications, standards, etc.)	
Status of IPR (if applicable)	NA
TRL before the project	1
TRL after the project	7

2.9.2 FSP accreditation methodology (Flexibility register)

Name:	FSP accreditation methodology (Flexibility Register)
Description	The register that stores the capabilities, type, and data required for utilizing the flexibility of FSPs
Innovativeness introduced compared to already existing Products/Services	Since the DSO flexibility platform is the first of its kind in Hungary, the setting up a flexibility register for the platform of FSPs is an utterly new concept on the Hungarian market.
Unique Selling Point USP - Unique Value Proposition UVP	It is a method and process description that enables the MO to carry out accreditation of FSPs to enter the market and keep track of their abilities.
"Market" – Customers	DSOs, FSPs.
"Market" - Solution already on the market	There is no such solution on the (Hungarian) market
Go to Market – Use model	The flexibility register operation and FSP accreditation method will be included in the respective network codes.
Time to Market	It is implemented in the network codes.
Open Source (yes/no)	NA
Partners involved inside the consortium	DSOs, University, Technology provider (E.ON, MVM, BME, MEI)
Partners involved outside the consortium	None
How the KER will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	In the form of new policies in the Network Codes.
Status of IPR (if applicable)	NA

TRL before the project	1
TRL after the project	6

2.10 Southern Cluster

KER	Main impact domain
F-channel forecasting module	Commercial and Technical
F-channel coordination module	Commercial and Technical
ABCM platform	Commercial

2.10.1 F-channel forecasting module

Name:	F-channel forecasting module (the F-channel platform itself represents one of the main outcomes of the effort invested in the Greek Demo and, since this module is a part of it, the development of the platform is the direct prerequisite for the usage of this module; the F-channel platform and its functionalities is described in deliverables, such as, for instance, D8.1 and D8.2).
Description	F-channel forecasting module can be exploited as forecasting and data analysis tool for procuring flexibility, for enhancing grid observability and reliability, and for network planning. The implemented forecasting module of F-channel can be used • to forecast weather data and energy production and consumption time series by TSOs, DSOs, aggregators, traders, RES producers, and consumers. • to enhance grid observability and reliability from TSOs and DSOs. That mitigates overloading of OHLs and HV/MV transformers and avoids possible violations of voltage limits. Also it can provide early warnings in case of hazardous power system regimes (icing, outages – based on weather information). • to enhance network planning via providing greater confidence and coordination when making strategic investments. The aspects of network planning are i) modelling of supply and demand, ii) identification of system needs, iii) identification of options for addressing system needs, and iv) make decisions on which options to progress.
Innovativeness introduced compared to already existing Products/Services	There are several commercially available forecasting tools. The implemented module makes use of advanced AI algorithms that provide precise predictions both for the weather and the related energy variables (production and consumption). In addition, there is a relatively large number of commercially available tools capable of running the load-flow assessments and N-1 reliability analyses of the power system, most of them are revolving around providing the results in the numerical, rather than graphical form, let alone projecting them directly on the map of the system. Having the source codes intended both for conducting the calculations and showing them in the map included in GUI could prove to be a

	great asset for anyone interested in the state of the system, including both the operators and the other entities participating in the market. In Greece currently the typical tabular representation is used. One of the main outcomes of the F-channel platform is the switch from the typical tabular representation of the power system to the georeferenced maps on which the system is shown in real-life environment. Not only the system itself will be shown, but the results of any calculations and the effects of any major changes will be graphically presented in the appropriate way. This is bound to increase the comprehensiveness of the results, potentially making the gravity of some of them understandable even for the public representatives not familiar with the power system topic.
Unique Selling Point USP - Unique Value Proposition UVP	The accuracy of demand and production predictions largely affects the performance of the DSO and TSO in using flexibility services. The F-channel module will vastly increase the forecasting precision. In addition, the codes that could aid in enveloping both the system state analyses that need to be conducted on a day-to-day by the engineers and the way of projecting the results of those calculations on the map of the system could be a major improvement compared to the currently available tools that are mostly capable of either the first or the second function. Having that kind of asset in possession could prove to be rather worthy to the different entities that are participating in the energy market. Finally, F-channel will enable the energy entities (both the TSO, DSO, and the other participants in the energy market) to illustrate the state of the system and the potential consequences of some action in an easy and understandable manner. This, in turn, not only increases the chance of explaining the results to the public, improving the transparency aspect of the companies' operation, but also enhances the cooperation between the system entities that participate in the processes, making those simpler and more efficient.
"Market" – Customers	• System operators (TSOs and DSOs). • Renewable sources investors. • Prosumers that are willing to offer their services to the grid. • Aggregators. • Large industrial consumers. • Scientific community.
"Market" - Solution already on the market	There is a variety of forecasting tools related to the power system, but we are not aware of such precision that F-channel achieves. There is a variety of tools for the power system analyses, but we are not aware of the codes and packages capable of real-life projection of the results on the map.
Go to Market – Use model	The best way of implementing this principle in the market is via the developed software solutions based around it.
Time to Market	.It is going to be an open source with the option to deliver services together with the app. Services would be offered on the market, but the app and its functionality would be an open source GUI, with some of the basic services offered free of charge for a certain period of time.
Open Source (yes/no)	Yes

Partners involved inside the consortium	UoA, EIG, IPTO, HEDNO
Partners involved outside the consortium	The following entities and companies could help in establishing the developed solution in the everyday practice: • DSOs, TSOs, energy communities and cooperatives; • scientific community; • RES generators and technology providers; • potential end-users; • consumers (households, businesses, industry); • journalists and the media.
How the KER will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	Basis for the development of the new solutions that will be commercially available to the interested users.
Status of IPR (if applicable)	NA
TRL before the project	3 – 4 Basic idea on principle developed upon the knowledge and experience of the involved partners.
TRL after the project	6 Fully developed method of the system representation already implemented in the software tool created in the demo.

2.10.2 F-channel coordination module

Name:	F-channel coordination module (the F-channel platform itself represents one of the main outcomes of the effort invested in the Greek Demo and, since this module is a part of it, the development of the platform is the direct prerequisite for the usage of this module; the F-channel platform and its functionalities is described in deliverables, such as, for instance, D8.1 and D8.2).
Description	The coordination module of F-channel (described in deliverable 9.4) provides an enhanced model of communication between energy entities in the system. This module can be used to connect the TSO and the DSO and enable the exchange of the essential information to procure flexibility, new services in the grid, and improve the existing ones (congestion management, voltage control, etc.). The Coordination module can also be adopted within the existing markets that procure capacity. Therefore, the F-channel platform will introduce the advanced way of the real-time communication between the different participants in the energy market.

	The F-channel coordination module can be exploited as a benchmark platform that connects TSOs and DSOs.
Innovativeness introduced compared to already existing Products/Services	One of the main concerns in the modern visions of the power systems, containing the larger number of participants and the decentralized energy production is the establishment of the reliable way for the data exchange between the participants. Although there are attempts at building the channels for communication between different types of participants, we are not aware of any of those being capable of including all of the interested sides in the energy market, the task that can hopefully be achieved by the technical solutions developed within the demo.
Unique Selling Point USP - Unique Value Proposition UVP	If one was to consider the modern vision of the power systems, they would easily conclude that the fact that the number of entities that are expected to participate in the everyday processes is set to grow rapidly compared to the state that is currently valid. This can be seen in two ways – as a great issue or as a great potential, with the latter being primarily based on the fact that the system could count on a larger number of flexibility options in case of a need, but only if there is a reliable way of communicating among all of the entities. If not, then the former becomes valid. This KER hopes to provide an answer to this issue and, hence, become a go-to option for the entities.
"Market" – Customers	• System operators (TSOs and DSOs). • Renewable sources investors. • Prosumers that are willing to offer their services to the grid. • Aggregators. • Large industrial consumers.
"Market" - Solution already on the market	We are not aware of such a solution.
Go to Market – Use model	From our point of view, the best way of integrating this solution in the market is by implementing it in the standard communication protocols between the participants in the energy market, either by developing a tool that would be built upon it or by allowing the entities to create their own tools for this purpose.
Time to Market	After the completion of the Demo.
Open Source (yes/no)	Yes
Partners involved inside the consortium	UoA, EIG, IPTO, HEDNO
Partners involved outside the consortium	The following entities and companies could help in establishing the developed solution in the everyday practice: • DSOs, TSOs, energy communities and cooperatives. • scientific community. • RES generators and technology providers. • potential end-users. • consumers (households, businesses, industry). • journalists and the media.

How the KER will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	Possibly by developing the new protocols and communication standards based on the usage of the principles implemented in the platform delivered by the demo.
Status of IPR (if applicable)	NA
TRL before the project	3-4 Basis made upon the experience of both the partners involved in the demo and the colleagues from the various entities, such as the system operators, for instance.
TRL after the project	6 Fully developed solution for the real-time communication between the entities in the system, verified within the platform created within the demo.

2.10.3 Active balancing and congestion management platform (ABCM)

Name:	ABCM platform
Description	This is a platform that includes several tools for the operators such as: • Dynamic real-time monitoring based on PMUs and SCADA measurements. • Pre-qualification of location-based services. • Online evaluation of services provision. • Coordination of ancillary services provision by FSPs. This platform receives measurements from either Phasor Measurement Units (PMUs) or SCADA so it needs the support of such infrastructure. The platform is more related to the management of the distribution grids considering congestion issues (i.e., overloading of lines, voltage limit violation). Further to that the platform has direct communication with market platforms and flexible consumers through the OneNet system in order to perform online evaluation of the provision of services and co-ordination of the ancillary services provided by the FSPs. More details about this platform and the architecture behind it can be found on Deliverable 8.1.
Innovativeness introduced compared to already existing Products/Services	
Unique Selling Point USP - Unique Value Proposition UVP	The ABCM will provide several benefits to the end-users: • Enhanced situational awareness. • Reduced operational cost for distribution grid.

	• Prevention of congestion.
"Market" – Customers	• TSOs • DSOs
"Market" - Solution already on the market	Monitoring tools exist in several SCADA solutions however the rest of the tools are not considered in any commercialized solutions.
Go to Market – Use model	The following market strategy will be followed: • Perform market analysis. • Develop a business plan. • Identify potential customers. • Find partners and seek for investors in order to create a spin-off company that can exploit the IPRs and turn the prototype into a minimum valuable product.
Time to Market	2-3 years after the completion of the project
Open Source (yes/no)	No
Partners involved inside the consortium	University of Cyprus, Electricity Authority of Cyprus, Transmission System Operator of Cyprus
Partners involved outside the consortium	Developers and integrators of ICT solutions RES generators and technology providers Consumers (households, businesses, industry)
How the KER will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	New product services
Status of IPR (if applicable)	Not defined yet among the partners
TRL before the project	3-4
TRL after the project	6

2.11 Northern Cluster

KER	Main impact domain
Harmonized market products	Policy
TSO-DSO Coordination Platform	Commercial
Optimization-based market clearing module	Commercial
Flexibility Register	Commercial

Nord Pool locationally enhanced intraday module	Commercial

2.11.1 Harmonized market products

Name:	Harmonized market products
Description	Northern cluster proposes a set of flexibility products for different time horizons (long-term, short-term, near-real-time), to be used simultaneously for different needs, and being applicable in different countries. Please refer to OneNet D7.3 "Report on market functionality", which will describe the products.
Innovativeness introduced compared to already existing Products/Services	One harmonized product can be used simultaneously for different needs (frequency and congestion management) by different buyers (TSO and DSO).
Unique Selling Point USP - Unique Value Proposition UVP	Harmonized products facilitate increased liquidity in the market whereby an FSP is not forced to decide for which purpose to offer its flexibility. The description of a product is universal enough for using it in different countries.
"Market" – Customers	System operators, FSPs, market operators
"Market" - Solution already on the market	Many Horizon projects propose different approaches to product definitions.
Go to Market – Use model	Results will be communicated to the stakeholders of concerned countries, mostly via dedicated events and, if needed, guidance and additional legislation.
Time to Market	2024
Open Source (yes/no)	NA
Partners involved inside the consortium	All WP7 partners
Partners involved outside the consortium	• end-customers (e.g. households) • aggregators • technology providers • energy suppliers, BRPs • local and national authorities, regulators • general public
How the KER will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	New flexibility products as defined by Northern demo for the use of whole region need to be launched via relevant guiding documents (by TSO, regulator and/or ministry) and legislation.
Status of IPR (if applicable)	Information about the flexibility products is public.

TRL before the project	NA
TRL after the project	NA

2.11.2   TSO-DSO Coordination Platform

Name:	TSO-DSO Coordination Platform
Description	TSO-DSO Coordination Platform is a software module that enables seamless and coordinated procurement of flexibility for system services (through different flexibility products) to meet the needs of participating TSOs-DSOs in the most efficient way (see deliverable 7.4 for further details).
Innovativeness introduced compared to already existing Products/Services	Operating with consolidated flexibility products in multiple regions in harmonized way.
Unique Selling Point USP - Unique Value Proposition UVP	Exact match to flexibility market participants needs by means of product definitions and process flow. Direct and customized digital interface to stakeholder internal systems for getting/setting relevant data.
"Market" – Customers	DSO/TSO, FSPs, MOs
"Market" - Solution already on the market	Many Horizon projects propose different approaches to product definitions.
Go to Market – Use model	Results will be communicated to the stakeholders of concerned countries, mostly via dedicated events and, if needed, guidance and additional legislation.
Time to Market	2024
Open Source (yes/no)	No
Partners involved inside the consortium	TSOs/DSOs, FSPs, MOs
Partners involved outside the consortium	No partners outside the consortium are involved.
How the KER will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	- New product - Direct industrial use - License agreement - Publications
Status of IPR (if applicable)	To be defined.
TRL before the project	TRL 6/8
TRL after the project	TRL 8

	Adding more TSOs, DSOs, FSPs, and MOs to test and qualify the solution.

2.11.3　　Optimization-based market clearing module

Name:	Optimization-based market clearing module
Description	A market clearing engine for a regional flexibility market (including multiple TSOs and DSOs). Please refer to Chapter 4 of OneNet D7.4"TSO-DSO Coordination module description and implementation" [4]. The module enables:

1. Jointly meeting flexibility needs of all SOs in an automated and optimal manner
    a. Maximizing procurement efficiency (minimizing flexibility procurement costs)
    b. Ensuring adequate FSP remuneration
    c. Meeting the bids' technical requirements
    d. Meeting the grids' operational limits
2. Enables the optimal trading/procurement of different products, namely: near real-time active energy (NRT-P-E), short-term active energy (ST-P-E), short-term capacity (ST-P-C), long-term capacity (LT-P-C), long-term capacity with activation stage (LT-P-C/E-res is the product for the reservation stage and LT-P-C/E-act is the product for the activation stage)
3. The module is automatically usable and accessible through a developed API.
4. Currently in the testing stage within the TSO-DSO coordination platform of the OneNet northern cluster (WP7)

Receives as input:

1. The set of flexibility bids submitted and their technical requirements (accepts different types of simple and complex bids – in harmonization process with MARI bid requirements – namely, fully divisible, fully indivisible, partially divisible, multipart (parent/children), and exclusive set bids),
2. The system operators' network information,
3. A purchase offer (fundamental information provided by the SOs to launch the market clearing process).

Outputs the market clearing results, including:

1. The market clearing output status
2. The portion of each bid to be cleared/purchased,
3. Total flexibility procurement costs,
4. Updated network state (updated flows and imbalance position)
5. etc.

When applicable (at the moment, for the NRT-P-E product), the module also allows linking with MARI for the forwarding of flexibility bids from the regional platform to MARI, maximizing the value potential of flexibility bids. The |

[4] https://onenet-project.eu/wp-content/uploads/2022/12/OneNet_D7.4_v.1.0.pdf

	forwarding of bids goes through a MARI check and a grid check process to ensure, respectively, that the forwarded bids abide by MARI's bid requirements, and that the forwarded bids do not pause constraint violation risks to the local grids if activated by MARI.
Innovativeness introduced compared to already existing Products/Services	Currently available flexibility market platforms typically do not consider grid limitations in the market clearing (or only to a limited extent), and typically rely on a manual market clearing process, which can be suboptimal and prone to mistakes and transparency issues. These aspects are addressed in the developed optimization-based market clearing module.

In addition, the developed optimization-based market clearing module allows solving multi system operators needs concurrently (considering their flexibility needs as well as their operational network constraints) including multiple products for multiple countries, which is a key innovative aspect. |
| Unique Selling Point USP - Unique Value Proposition UVP | Optimization-based market clearing enabling each system operator (SO) to meet their flexibility needs, at minimum possible cost, while abiding by the grid limitations of all the grids involved, as well as the technical limitations of the submitted bids. Hence, this offers a joint grid impact and bid impact assessment mechanism embedded in the optimal market clearing process, returning optimal and grid impact-aware/safe market clearing outcomes. The developed optimization-based market clearing module allows optimally solving multi system operators needs concurrently (considering their flexibility needs as well as their operational network constraints), enables the trading of multiple flexibility products (of different types, e.g., capacity and energy; at different time horizons: near real time, to short and long term) for multiple countries.

The process is time efficient, explainable and traceable for maximum transparency, and is automatically usable through a developed API.

The process is based on a multipurpose global optimization process:

1. Jointly meeting flexibility needs of all system operators
2. Maximizing procurement efficiency (min procurement costs)
3. Ensuring adequate flexibility service providers' (FSPs) remuneration
4. Meeting the bids' technical requirements
5. Meeting the grids' operational limits

When applicable (at the moment, for the NRT-P-E product), the module also allows linking with MARI for the forwarding of flexibility bids from the regional platform to MARI, maximizing the value potential of flexibility bids. The forwarding of bids goes through a MARI check and a grid check process to ensure, respectively, that the forwarded bids abide by MARI's bid requirements, and that the forwarded bids do not pause constraint violation risks to the local grids if activated by MARI. |
| "Market" – Customers | • System operators (both transmission system operator, TSOs, and distribution system operators, DSOs).
• Market operators (MOs). |
| "Market" - Solution already on the market | No solution on the market with the introduced features and functionality. Collaboration possible with existing flexibility and electricity market platforms to integrate the optimization-based market clearing module in their market clearing process. |

Go to Market – Use model	1. Development and testing within the Northern cluster demonstrator (WP7).
	2. Showcase the functionality to potential customers through workshops, meetings, and public deliverables.
	3. Advance in technology readiness level to take the product to market.
Time to Market	Current development is within the Northern demo cluster of OneNet (WP7). The process is gaining additional "market" maturity as part of the development process (including model/methodological developments as well as IT developments). Time to market can be 0 – 5 years after completion of OneNet, in case the opportunities for further development are there.
Open Source (yes/no)	no
Partners involved inside the consortium	VITO is the sole developer of the module/tool.
	However, the development of the use cases, integration within the TSO-DSO coordination platform, testing and feedback is continuously received and performed in collaboration with WP7 partners.
Partners involved outside the consortium	No partners outside the consortium are involved.
How the KER will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	• New service • License agreement • Direct industrial use • Technology transfer
Status of IPR (if applicable)	To be defined.
TRL before the project	TRL 3
TRL after the project	TRL 6/7

2.11.4   Flexibility Register

Name:	Flexibility Register
Description	Flexibility register is a software module that stores and manages information about resources participating on flexibility markets, and conducts processes for contract management, prequalification and verification and settlement. Flexibility register is closely integrated with TSO-DSO coordination platform and Market operator platforms to enable a well-functioning local flexibility market (see deliverable 7.2 for further details).
Innovativeness introduced compared to already existing Products/Services	Facilitating harmonized information exchange and data management to enable novel processes for local flexibility markets.

Unique Selling Point USP - Unique Value Proposition UVP	Efficient management of data needed by local flexibility markets, which allows SOs to procure flexibility from multiple resources and multiple markets.
"Market" – Customers	DSO/TSO, FSPs, MOs
"Market" - Solution already on the market	Similar systems are piloted in different projects, but off-the-shelf products are not widely available.
Go to Market – Use model	Results will be communicated to the stakeholders of concerned countries, mostly via dedicated events and, if needed, guidance and additional legislation.
Time to Market	2024
Open Source (yes/no)	No
Partners involved inside the consortium	TSOs/DSOs, FSPs, MOs
Partners involved outside the consortium	FSPs
How the KER will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	• New product • Direct industrial use • License agreement • Publications
Status of IPR (if applicable)	To be defined.
TRL before the project	TRL 6/8 Functionalities of Single Flexibility Platform taken as starting point from project INTERRFACE (TRL 8). Further functionalities i.e. flexibility contract management, baseline calculation and settlement functionalities, further common flexibility products (TRL 6).
TRL after the project	TRL 8 Adding more TSOs, DSOs, FSPs, and MOs to test and qualify the solution.

2.11.5   Nord Pool locationally enhanced intraday module

Name:	Nord Pool locationally enhanced intraday module
Description	Nord Pool will include locational information to Intraday market bids and expose these locational orders to a flexibility market coordination platform operated by the system operators. Please refer to OneNet D7.3 "Report on market functionality".
Innovativeness introduced compared	Enhancing Intraday market orders with locational information allowing activation of flexible asset in a dedicated geographical location instead of a

to already existing Products/Services	wider bidding zone. The same order can be matched on the Intraday market or on the flexibility market adding needed liquidity on both sides.
Unique Selling Point USP - Unique Value Proposition UVP	Customer can offer their flexible assets on a wider market with more commercial potential instead of being limited to a small, fragmented and use case specific market.
"Market" – Customers	Market participants and aggregators with control over flexible assets. System operators with need for flexibility.
"Market" - Solution already on the market	Flexibility markets exist in the open, but none offer combined Intraday market access.
Go to Market – Use model	Nord Pool will facilitate flexibility trading by utilizing Intraday platform. The flexibility orders can be activated for any need the SOs might have. Flexibility asset owners can also offer the same asset on the intraday market with the same order which will help them to commercialise the asset more as they have a broader possibility to trade the flexibility. Normal business model is based on annual fees to access markets plus a variable fee which is charged per traded volume. Results of the project will be communicated to the stakeholders of concerned countries, mostly via dedicated events and, if needed, guidance and additional legislation.
Time to Market	2024
Open Source (yes/no)	No
Partners involved inside the consortium	TSOs/DSOs FSPs
Partners involved outside the consortium	No partners outside the consortium are involved.
How the KER will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	Add-on to existing Intraday market offering for Nord Pool members.
Status of IPR (if applicable)	To be defined.
TRL before the project	TRL 1
TRL after the project	TRL 6

2.12 WP11: From OneNet demonstrators to EU wide implementation of coordinated market schemes and interoperable platforms for standardized system products

KER	Main impact domain
OneNet KPIs repository	Policy
Definition and analysis of Business Models for OneNet BUCs. Reported in D11.5	Commercial, Societal
Strategies for customer engagement in the provision of system services. Reported in D11.6	Commercial, Societal, Policy
Methodology for market architecture harmonization analysis. Reported in D11.2	Policy
Methodology for market phase harmonization analysis. Reported in D11.2	Policy

2.12.1   OneNet KPIs repository

Name:	OneNet KPIs repository
Description	This KER is a list of KPIs including their characterization, definition and calculation formula.
Innovativeness introduced compared to already existing Products/Services	Given the high number of demos participating in the OneNet project and the variety of KPIs defined within the project, this list is quite extensive compared to the existing ones covering KPIs from market operation and grid operation to data management focusing on the topic of flexibility provision.
Unique Selling Point USP - Unique Value Proposition UVP	Researchers on the topic of flexibility markets and research departments of TSOs and DSOs will be able to find in an easy way the KPIs they need to benchmark the process of their own research activities.
"Market" – Customers	- scientific community - DSOs, TSOs - technology providers
"Market" - Solution already on the market	Other EU research projects (CoordiNet, EUniversal, EU-SysFlex, InterFlex, SmartNet) have defined KPIs related to flexibility and TSO-DSO-FSP coordination.
Go to Market – Use model	The channel that will be used to reach the targeted stakeholders is through open data platforms such as Zenodo and through publications.
Time to Market	1 year (end of 2023)
Open Source (yes/no)	yes
Partners involved inside the consortium	All WP11 T11.1 partners and partners acting as contact points with demos.
Partners involved outside the consortium	- scientific community - technology providers
How the KER will be put in use (new policy, new	Publications, direct scientific use

standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	
Status of IPR (if applicable)	Not applicable
TRL before the project	TRL 4
TRL after the project	TRL 8

2.12.2 Definition and analysis of Business Models for OneNet BUCs

Name:	Definition and analysis of Business Models for OneNet BUCs
Description	For each of the BUCs in the OneNet project, the Business Models (BM) specifications are defined focusing on one of the system roles involved in the BUC. Reported in OneNet Deliverable 11.5. The BM will be defined and described, including aspects like the definition of the value provided by the service or product to be delivered, its main customers, the relationships among the several stakeholders involved in the implementation of the BM, the channels to be used to reach the customers, or the main sources of revenues and expenses resulting from the implementation of this BM. Together with this, the role to be played by each main system stakeholder in all the BMs that are focused on it will be compared. Lastly, and assessment of the level of engagement of the key stakeholders involved in the implementation of the BM will be carried out, and, based on this, some measures to implement to increase the level of engagement of those key stakeholders that have a low level of interest in the implementation of the BM will be proposed.
Innovativeness introduced compared to already existing Products/Services	A proper BM has not been defined and assessed yet for the deployment of the specific services targeted by each of the BUCs in the OneNet project in the regional/country context of each BUC. Thus, this involves the novel application of already existing BM definition and assessment methodologies to the specific case of the BUCs in the OneNet project.
Unique Selling Point USP - Unique Value Proposition UVP	The regulatory authorities will be able to use the BM definition and assessment carried out here to define regulatory changes to be implemented to enable/facilitate the development of the services targeted by the corresponding BUCs. The main system stakeholders involved in the deployment of these services will also benefit from this BM definition and assessment exercise by learning the framework developed for the deployment of the corresponding service and the reasons for the regulatory changes triggered by it, aimed at the implementation of the targeted services.
"Market" – Customers	• Regulatory Authorities • System stakeholders (TSO, DSO, Market Operators, FSPs, Aggregators, etc.)

"Market" - Solution already on the market	The academic community, regulatory authorities and policy institutions have developed previously similar proposals to drive the implementation of certain services in electricity markets.
Go to Market – Use model	The regulatory authorities and system stakeholders will learn about our BM proposal by publishing it in our relevant internet repository sites and explaining the implementation of this in Workshops, Meetings, and other relevant fora.

Resources needed include proper internet repositories and access to the relevant for a for dissemination of our proposal. |
Time to Market	1 year (end of year 2023)
Open Source (yes/no)	Yes
Partners involved inside the consortium	All the WP11 Task 11.5 partners and contact institutions in Demos.
Partners involved outside the consortium	• Regulation bodies • EU policy makers • DSOs, TSOs, energy communities and cooperatives • scientific community • RES generators • consumers (households, businesses, industry) • Local/regional/national authorities and other public bodies • general public • Consumers • journalists and the media • EU citizen and consumer organisations
How the KER will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	New policies are to be developed driving the implementation of the services according to the BM defined in this result. Key stakeholders will get familiar with the aim of the implementation of these policies by getting access to the definition and assessment of the relevant BMs
Status of IPR (if applicable)	Not applicable
TRL before the project	TRL1: Nonexistent, only principles on which the development of BMs is based
TRL after the project	TRL2: Concept level. Specific policies should be derived based on the recommendations within the BM definition and assessment carried out in this result.

2.12.3   Strategies for customer engagement in the provision of system services

Name:	Strategies for customer engagement in the provision of system services
Description	For the main categories of customers involved in the OneNet project and the use cases that will be analysed in depth, 'standardised' engagement strategies will be provided in the corresponding deliverable. The results will be reported in OneNet Deliverable 11.6. The strategies will be defined and described according to the category of customer of interest and the value (monetary and non-monetary) provided to different stakeholders.
Innovativeness introduced compared to already existing Products/Services	Customer engagement is still a missing pillar in the development of markets for system services in the electricity sector. While theoretical discussion of the matter is not new, available strategies to address and solve the issue are usually untested. The strategies proposed by OneNet are innovative because they rely, to the largest possible extent, on demos' experience and extensive discussion with a plurality of sector' stakeholders and leading research institutions.
Unique Selling Point USP - Unique Value Proposition UVP	Stakeholders involved in the implementation of customer engagement strategies will have a reference model to implement the most effective strategy according to the category of customer considered. Main values are expressed in terms of time-saving and cost-saving for stakeholders which want to engage customers, compared to a scenario where these strategies have not been formulated.
"Market" – Customers	• Energy companies • Electricity system operators • National regulatory authorities and policy makers
"Market" - Solution already on the market	The academic community, regulatory authorities, policy institutions and new players on electricity markets (e.g. aggregator, FSPs) have developed previously similar proposals to drive the implementation of certain services in electricity markets. However, so far, customer engagement has been very limited.
Go to Market – Use model	Since the KER is a piece of knowledge, the plan is to promote its penetration in the "market", by giving visibility to it online and offline. We will do this online via publications and other multimedia contents, such as videos or podcasts, that will remain accessible in the project website and in permanent repositories such as Cadmus at the EUI. We will do this offline and via presentations during conferences and trainings for people working in the sector.
Time to Market	1 year (end of year 2023)
Open Source (yes/no)	Yes
Partners involved inside the consortium	All WP11 Task 11.6 partners, plus relevant partners involved in the project demonstrators.
Partners involved outside the consortium	• Regulatory bodies • EU policymakers • Scientific community • Sector stakeholders (TSOs and DSOs, energy communities, energy generators, aggregators and energy retailers, consumers) • Associations of stakeholders

How the KER will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	New policies are to be developed in order to create a favourable environment where stakeholders like aggregators, FSPs and energy companies can implement the aforementioned strategies.
Status of IPR (if applicable)	Not applicable
TRL before the project	4 (technology validated in laboratory)
TRL after the project	6 (technology demonstrated in relevant environment)

2.12.4 Methodology for market architecture harmonization analysis

Name:	Methodology for market architecture harmonization analysis
Description	This KER is a methodology to assess the market harmonization potential and barriers.
Innovativeness introduced compared to already existing Products/Services	The proposed methodology is original since it does not consider the markets in a market architecture as standalone entities but pursues their coordinated functioning. Markets can cooperate by using the same pool of resources if they are harmonised (i.e. if they have the same design characteristics). Bid forwarding between markets is a means of coordination as it allows resources to be allocated between them, thereby creating value for market participants. The methodology supports market design by analyzing the potential and barriers to harmonizing the market architecture.
Unique Selling Point USP - Unique Value Proposition UVP	Researchers on markets integration, Regulators, and research departments of Market Operators, TSOs and DSOs to analyze and design market-based TSO-DSO-Costumer coordination to enhance market participation and value staking.
"Market" – Customers	• Scientific community • Regulatory bodies • MOs, DSOs, TSOs
"Market" - Solution already on the market	Other EU research projects (CoordiNet, SmartNet) have addressed the market-based coordination of the TSO-DSO-Costumer chain.
Go to Market – Use model	The channel that will be used to reach the targeted stakeholders is through publications.
Time to Market	1 year (end of 2023)
Open Source (yes/no)	yes
Partners involved inside the consortium	All WP11 T11.2 partners and partners acting as contact points with demos.
Partners involved outside the consortium	• DSOs, TSOs, energy communities and cooperatives • scientific community • RES generators and technology providers

	• potential end-users • consumers (households, businesses, industry) • Local/regional/national authorities and other public bodies • EU policy makers • standardisation/regulation bodies • EU citizen and consumer organisations
How the result will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	Publications, direct scientific use New Policy recommendations
Status of IPR (if applicable)	Not applicable
TRL before the project	4
TRL after the project	8

2.12.5　Methodology for market phase harmonization analysis

Name:	Methodology for market phase harmonization analysis
Description	This KER is a methodology to assess the market phases' harmonization potential and barriers.
Innovativeness introduced compared to already existing Products/Services	The proposed methodology is original since it decouples the markets in their elementary phases. The assessment checks for potential and barriers to harmonize the processes among the market phases, the underlining assumption is that the highest level of commonalities among market phases leads to an increased overall market functioning efficiency. The methodology allows for formulating recommendations to design harmonized market phases.
Unique Selling Point USP - Unique Value Proposition UVP	Researchers on markets integration, Regulators, and research departments of Market Operators, TSOs and DSOs to analyze and design market-based TSO-DSO-Costumer coordination to enhance market participation and value staking.
"Market" – Customers	• Scientific community • Regulatory bodies • MOs, DSOs, TSOs
"Market" - Solution already on the market	Other EU research projects (CoordiNet, INTERRFACE, EU-SysFlex, SmartNet) and other initiatives (Active System Management report[5], Universal Smart Energy Framework (USEF)[6]) have addressed the topic of market-based coordination of TSO-DSO-Costumer chain and the corresponding market-phases.

---

[5] The TSO–DSO Report on An Integrated Approach to Active System Management is a report written by ENTSOE and four DSO organisations, namely Cedec, E.DSO, Eurelectric and Geode.
[6] SP Energy Networks, "Project FUSION – GB Reference Implementation of USEF," 2020

Go to Market – Use model	The channel that will be used to reach the targeted stakeholders is through publications.
Time to Market	1 year (end of 2023)
Open Source (yes/no)	yes
Partners involved inside the consortium	All WP11 T11.2 partners and partners acting as contact points with demos.
Partners involved outside the consortium	• DSOs, TSOs, energy communities and cooperatives • scientific community • Local/regional/national authorities and other public bodies • EU policy makers • standardisation/regulation bodies
How the result will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	Publications, direct scientific use New Policy recommendations
Status of IPR (if applicable)	Not applicable
TRL before the project	4
TRL after the project	8

2.13 Open Call Beneficiaries

Project	Associated WP / Demo	Result	Main impact domain
FLEXUM	Spanish Demo	Flexibility solution	Commercial
ODINA-TS	ENTSO-E Transparency Platform[7]	Outliers detection and data imputation tool for energy related time series data	Policy
GEOGRID	Greek Demo	Integration of the load profiles into the load flow calculation tool	Technical / Commercial
GEOGRID	Greek Demo	Visualization of the load flow results on the georeferenced system map	Technical / Commercial
FLAGS	Spanish Demo	FLAGS	Commercial
OneNet – Active Prosumer	Cypriot Demo	ActiveProsumer Solution	Commercial
WISeGrid	Portuguese Demo	WIS4Flex	Commercial
Northeast Flow	Northern Cluster	Digital heating with flexibility services	Commercial
ADREE	ENTSO-E Transparency Platform	Built a SaaS solution for data cleaning and correction	Commercial
RUNADMTS	ENTSO-E Transparency Platform	Detection of Anomalies in ENTSO-e Datasets	Commercial

2.13.1   FLEXUM by Odin Solutions SL (ODINS)

Name:	Flexibility solution
Description	The solution that provides flexibility in the context of energy consumption
Innovativeness introduced compared to already existing Products/Services	It offers a global solution, from IoT Gateways with sensors and actuators to flexibility services that rely on data analytics to self-adapt their predictions based on previous executions. It has also proved to be ready-to-plug in the Spanish energy market after having integrated it with the Spanish NEMO (OMIE).
Unique Selling Point USP - Unique Value Proposition UVP	The solution is designed to reduce consumption peaks and move loads to different time slots when it is necessary (first case, to reduce congestion) or recommended (second case, to reduce costs).
"Market" – Customers	DSOs and aggregators which want to control the congestion in their networks, and low or mid-energy consumers which can afford to switch loads to different time slots in the day.

---

[7] The transparency platform (https://transparency.entsoe.eu) is a data platform provided by ENTSO-E that collects data coming from European TSOs.

"Market" - Solution already on the market	There were no alternatives in Spain by the end of the project.
Go to Market – Use model	Channels to reach the customers: • Conferences (both developer and business). • Website / social media. Resources needed for going to the market: • More development in the smart data analytics area. • Stability at a regulation level (in the process all over Europe).
Time to Market	6 months (estimated time required to design a user-friendly configuration/administration interface)
Open Source (yes/no)	No
Partners involved inside the consortium	i-DE; OMIE
Partners involved outside the consortium	ODINS and external collaboration with UMU (Murcia University, Espinardo) Other possible: • DSOs, TSOs, aggregators, energy communities and cooperatives • Scientific community • RES generators and technology providers • Consumers (households, businesses, industry) • Local/regional/national authorities and other public bodies • EU policymakers • Standardization/regulation bodies
How the result will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	• New product/service. • Publications (to publish a scientific journal) • Research (to reuse of know-how in future R&D projects).
Status of IPR (if applicable)	Not applicable.
TRL before the project	4
TRL after the project	7

2.13.2   ODINA-TS by Beedata Analytics SL

Name:	Outliers detection and imputation data tool
Description	The AI data quality toolbox is made for Identification of erroneous data and imputation of erroneous data, in time series of energy related data
Innovativeness introduced compared	The tool is formed by two modules, Outliers detection and data imputation. The outliers detection module is based on a combination of two methods; a pattern based algorithm in order to identify abnormal patterns in data, and a baseline

to already existing Products/Services	method based on N-BEATS algorithms, to be applied in energy events which ultimately leads to a learn model able to detect 'normality'. The imputation module is based on obtaining the expected value using the baseline model and pattern-based models previously described in the detection methods. In comparison to the existing MAD and LOF outliers detection methods, our proposal gives more accuracy in detection of contextual and collective outliers in time data series, where MAD and LOF are not able to work.
Unique Selling Point USP - Unique Value Proposition UVP	The main benefit from the customer view is having a tool that allows to trust in the quality of data for further use in forecasting, modeling or internal use in the organization, since low quality data is propagated along the organization via erroneous data-driven decisions. A common error-prone use case would be forecasting. Fitting forecasting models with erroneous data would lead to predicting erroneous scenarios. With the AI data quality toolbox developed in the project, we improve the quality of the data managed by the data provider.
"Market" – Customers	We address the tool to be used in data exchanges among Transmission System Operators (TSO), Distribution System Operators (DSO), consumers, and prosumers, where data and analysis is increasingly becoming an integral part of the everyday electricity system.
"Market" - Solution already on the market	Odin Solutions SL, Presify Analytic Software Inc, Artelys
Go to Market – Use model	There is no Go to Market model, since the tool is offered as it is, including the open-source code, and the API communication system, to be integrated into the OneNet Platform, an offered free of licence as a Software as a Service.
Time to Market	
Open Source (yes/no)	yes, available at: https://nextcloud.tech.beegroup-cimne.com/s/mA7yNA8ZtRLp5Pe
Partners involved inside the consortium	ENTSO-e
Partners involved outside the consortium	• DSOs, TSOs, energy communities and cooperatives • scientific community • RES generators and technology providers • consumers (households, businesses, industry) • Local/regional/national authorities and other public bodies • EU policy makers • standardisation/regulation bodies • EU citizen and consumer organisations
How the result will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	New product service for direct national policy, industrial or micro-grid use.

Status of IPR (if applicable)	No applicable
TRL before the project	TRL5
TRL after the project	TRL8

2.13.3 GEOGRID by Software Company Ltd.

Name:	Integration of the load profiles into the load flow calculation tool
Description	In the scope of the GEOGRID solution, accepted after the submission for the Scenario 1 of the OneNet Open Call (Deep power system analysis through GIS server application (Georeferenced power system modeling and analysis utilizing the geo-server)), the typical demand profiles have been developed for the four standard types of demand – household demand, industrial demand, commercial service demand and electric vehicle (EV) demand. These load profiles have been developed based on the various sources and measurements, with their proper value expected once they are fully integrated in the F-channel platform that will be developed under the Greek Demo of the OneNet project.
Innovativeness introduced compared to already existing Products/Services	Although the typical load profiles are, by themselves, something that the public is already familiar with, the profiles that have been developed in the scope of GEOGRID proposal and the form in which they have then been delivered to the assigned mentors allows the full integration into the load flow engine that will be operational in the appropriate module of the F-channel platform. This will, in turn, give the users of the platform an option of running the load flow analyses on the specified timeframes (that could span even for several days), with power of demand in the nodes of the system automatically changing according to the type to which it belongs and the load curve that was created for that type. We are not familiar with other software tools offering the same capabilities without some complex scripts that would need to be drafted manually by the user.
Unique Selling Point USP - Unique Value Proposition UVP	As stated above, the developed solution would provide the users with an option of having the load curves that would describe the behavior of the demand in the system already integrated in the platform that they would be using. This would make the calculations of the load flows and voltages in the system much easier both in case in which the analyses would need to be conducted considering the longer period of time (such as several hours or days, for instance) and in case in which the user would like to run the load flow calculation for the specified hour of the specified day. This result would allow them to simply designate the hour of the day for which the calculation would need to be run and the demand would be adjusted accordingly, sparing them from the effort necessary for modifying the load in every node in their system of interest manually.
"Market" – Customers	The following customers could be seen as interested in this result: TSOs, DSOs, Consulting companies, Researchers.
"Market" - Solution already on the market	At the time of drafting this report, we are not aware of the companies that are offering similar services, especially together with the additional functionalities encompassed by the F-channel platform.
Go to Market – Use model	The solution would, first of all, need to be promoted as one of the results of the OneNet project, leading to multiple customers getting the initial information regarding the positive aspects of it. For further communication with the clients,

	one-on-one meetings could be organized or, otherwise, public presentations could be held. These public presentations could, of course, include the Questions and Answers (Q&A) sessions that could give the users the option to obtain more information on the solution and decide if it could be applicable on their work.
Time to Market	At the end of the project.
Open Source (yes/no)	Yes
Partners involved inside the consortium	University of Athens (UoA)
Partners involved outside the consortium	• TSOs. • DSOs. • Consulting companies. • Educational facilities. • Researchers. • Journalists covering the topics related to the energy sector.
How the result will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	Hopefully, the solution will be put directly into practical use by the interested clients, with the result foreseen as the asset that will complement the remaining functionalities of the F-channel platform. In line with what was stated near the beginning of this result report, the result is expected to allow the users to do the desired calculations for the longer period of time with the optimal amounts of effort and time dedicated to it. Naturally, this will lead to the higher efficiency of the processes and better utilization of the available resources, even giving the users an option of using the saved time to conduct more analyses (such as some sensitivity estimations) that would otherwise need to be left out.
Status of IPR (if applicable)	So far, we are not aware of any Intellectual Property Rights issues.
TRL before the project	4 (Idea that came to be after the OneNet Open Call was published.)
TRL after the project	6 (Fully prepared solution, integrated in the F-channel environment.)

Name:	Visualization of the load flow results on the georeferenced system map
Description	The main tasks that were specified in the OneNet Open Call Scenario 1, for which the GEOGRID solution submitted an application that was subsequently selected, were the development of the code that would be able to run load flow analyses, the creation of the georeferenced map of the chosen part of the Greek system and the implementation of the visualization of the results of the performed load flow calculations on the created map of the system. The final of these points can be seen as one of the main advancements that was begotten within the scope of this solution, making both the work of engineers and the communication of the engineers with the wider public easier at the same time.
Innovativeness introduced compared to already existing Products/Services	Similar to what was claimed in the cell above, this result combines the option of running the accurate load flow calculations on the selected parts of the system and giving an insight into the obtained load flow and voltage values on the map in which the georeferenced projection of the nodes and lines of the grid is given. Even though there is, admittedly, a large number of the software tools currently available on the market that have the built-in functionality of modelling the grid and running the calculations, we are, at the moment, not aware of any of them

	offering the possibility of seeing the calculation results in such a comprehensive manner such as the GEOGRID solution and the codes developed in its scope.
Unique Selling Point USP - Unique Value Proposition UVP	The selling point and the unique value of this solution for the potential users can be evaluated from two different points of view – point of view of the work of the engineers that would work in the developed tool and point of view of making the communication with public and the external stakeholders much easier. From the former perspective, the engineers are usually dealing with the commercially available tools that, although doing the analyses accurately, show the results in the tabular forms that may be difficult to understand, especially for beginners. If they were given a possibility of seeing the flows on a system map, it would make drawing the conclusions much faster, with the possibility of human error in this step significantly reduced. On the other hand, the general public is usually not so familiar with the engineering terminology and the system characteristics, so, if the system operator (for example) would like to describe some problem on the public event and try to underline the importance of some of the actions that are proposed to mitigate that issue, the obstacle for that could be the lack of tool by which the results could be shown in the form that the audience can understand. The GEOGRID solution gives an opportunity to overcome this difficulty as well.
"Market" – Customers	The following customers could be seen as interested in this result: TSOs, DSOs, Consulting companies, Researchers.
"Market" - Solution already on the market	At the time of drafting this report, we are not aware of the companies that are offering similar services, especially together with the additional functionalities encompassed by the F-channel platform.
Go to Market – Use model	The solution would, first of all, need to be promoted as one of the results of the OneNet project, leading to multiple customers getting the initial information regarding the positive aspects of it. For further communication with the clients, one-on-one meetings could be organized or, otherwise, public presentations could be held. These public presentations could, of course, include the Questions and Answers (Q&A) sessions that could give the users the option to obtain more information on the solution and decide if it could be applicable on their work.
Time to Market	At the end of the project.
Open Source (yes/no)	Yes
Partners involved inside the consortium	University of Athens (UoA)
Partners involved outside the consortium	- TSOs. - DSOs. - Consulting companies. - Educational facilities. - Researchers. - Journalists covering the topics related to the energy sector.
How the result will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license	Once again, the solution will hopefully be put directly in the practical use by the interested clients, with the result foreseen as the asset that will complement the remaining functionalities of the F-channel platform. In line with the stated ideas and intentions, it is expected to be a solid tool that will help both the users of the solution and their business partners or other stakeholders. For the former, it would be an asset that would improve the efficiency of their processes, while also reducing the probability of mistakes due to the results given in the form that

agreement, publications, standards, etc.)	is not easy to understand even by the people working in the tool on daily basis. For the latter, it would enhance the comprehensiveness of the conclusions that the energy specialists are trying to make, thus making the decision process in the energy sector more reliable and reliant on the expert opinions and suggestions.
Status of IPR (if applicable)	So far, we are not aware of any Intellectual Property Rights issues.
TRL before the project	4 (Idea that came to be after the OneNet Open Call was published.)
TRL after the project	6 (Fully prepared solution, integrated in the F-channel environment.)

2.13.4 FLAGS by Stemy Energy

Name:	FLAGS
Description	Participate in the local flexibility markets, aggregating the behavior of several energy resources in commercial buildings, and actuating in real time.
Innovativeness introduced compared to already existing Products/Services	It is the first time in Spain with a real participation in local markets. The main contribution is to aggregate of behavior of hundreds of HVAC devices to produce a coordinated response in seconds without compromising comfort levels, taking into account the optimal point of operation of the consumers.
Unique Selling Point USP - Unique Value Proposition UVP	Optimization of consumers, improving energy efficiency, while participating in flexibility markets to help the electricity grid.
"Market" – Customers	Consumers.
"Market" - Solution already on the market	Themovault.
Go to Market – Use model	Channels: suppliers, installers, ESCOs, energy communities. Resources: CAPEX for smart devices installation.
Time to Market	1 year.
Open Source (yes/no)	No
Partners involved inside the consortium	i-DE, COMILLAS, OMIE
Partners involved outside the consortium	Not applicable.
How the result will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	Not applicable.

Status of IPR (if applicable)	IPR of aggregation platform = STEMY. Type protection: Secret.
TRL before the project	TRL7
TRL after the project	TRL8

2.13.5 OneNet – Active Prosumer by H. Wise Wire Energy Solutions Limited

Name:	ActiveProsumer Solution
Description	The ActiveProsumer Solution consists of a Communication Architecture along with a novel Energy Management algorithm. The solution enables ancillary service provisioning from active prosumers, while lowering prosumers committed availability uncertainty and increasing their potential profits. At the same time the solution ensures ancillary services provisioning with fast response from the prosumer electrical equipment through a combination of high-level and low-level control parts.
Innovativeness introduced compared to already existing Products/Services	- The ActiveProsumer Solution allows fast-response ancillary services provisioning by flexible prosumers to enable active management capabilities for the distribution grid while maximizing prosumers potential revenues through the participation in ancillary services market frameworks. All these are provided to the end-users in an automatic and highly customer-centric way thus increasing consumer engagement in a seamless manner. Existing solutions are not transparent or may require the invasive involvement of the end-users which decreases their acceptance rate. - Communication Architecture considers a bidirectional signal exchange framework between the prosumers and the DSO for enabling ancillary services provisioning in a secure, fast (every 30 seconds) and over the internet manner in contrast to existing solution which utilize a slower low-bandwidth communication with asynchronous measurement exchange every 15-60 minutes or a dedicated communication network that limits the wide applicability of such solutions. - Novel Energy Management algorithms: - While existing solutions mainly rely on self-consumption operation for the prosumer, our solutions enable a multi-mode operation based on: energy arbitrage, self-consumption, or external coordination for ancillary service provisioning. In each operation mode, the transient operation of the prosumer devices and forecasting of load demand and generation profiles are considered to improve the overall prosumer performance. Our solution is based on a two-level architecture with the top level acting at 1-minute intervals and the low-level control at 30 seconds intervals. Thus, ensuring the provision of ancillary grid services by prosumers in a more accurate and dynamic manner, in contrast to existing approaches which are based on 15-30 minutes intervals.
Unique Selling Point USP - Unique Value Proposition UVP	Automated participation in the ancillary services market and ancillary services provisioning scheme

	• Increased potential reimbursements and revenues for participation in the ancillary services market due to lower uncertainty in provisioned availability through to the utilization of forecasting techniques. Transparency of the operations through dedicated end-user live screens, thus increasing trust throughout the scheme and involved parties.
"Market" – Customers	Commercial and industrial prosumers with PV generation and energy storage systems.
"Market" - Solution already on the market	Currently no competing companies are active in our local market. Internationally some of our competitors that include intelligent methodologies for energy management in their solutions are: Moixa Stem AutoGrid It is noted that the solutions provided by the competitors have some similarities in terms of prosumer energy management schemes; however, these solutions are mainly focusing on managing prosumer in a variable pricing scheme (energy arbitrage) and not in a local ancillary services market.
Go to Market – Use model	To reach our identified customers and depending on the country of application we will use two channels: a) Direct sales to the prosumer for local and neighboring markets b) Licensing of our novel energy marketing algorithms to existing players already in other international markets The following resources are needed for going to the market: a) Additional funding for refining the algorithms through testing them in local prosumers in order to reach TRL 8-9 b) Partnerships with international players already active in markets abroad for international commercialization of our products/services or licensing agreements
Time to Market	Year 2024 in Cyprus, 2025 internationally.
Open Source (yes/no)	No
Partners involved inside the consortium	-
Partners involved outside the consortium	• DSOs, TSOs, energy communities and cooperatives • RES generators and technology providers • Consumers (households, businesses, industry) • Local/regional/national authorities and other public bodies
How the result will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement,	The results will be put to use as a new product/service entering the market of smart grids. We expect to disrupt the local market while we expect to be at a position to offer novel and beyond the state-of-art services for the international markets. The ActiveProsumer Solution can be applied to all types of buildings which are equipped with energy generation and storage equipment, i.e., industrial/commercial buildings and households. However, it is important to highlight that the energy/ancillary services market formulation in each country can highly affect the market entrance of our solution. Our solution assumes a local ancillary services market framework which

publications, standards, etc.)	has not been formulated yet in existing markets and therefore the commercialization of the Active Prosumer Solution can be highly affected by the market setup and regulations.
Status of IPR (if applicable)	H. WISE WIRE ENERGY SOLUTIONS LIMITED is the sole owner of all intellectual property rights for the ActiveProsumer solution
TRL before the project	TRL 3-4
TRL after the project	TRL 6-7 → The technology was demonstrated in an actual prosumer building. Key components of the technology were previously validated in relevant environments (e.g., the communication infrastructure) while along with the novel energy management algorithms, necessary adjustments and developments have been made to reach a demonstration in an operational potential customer building.

2.13.6   WISeGrid by Watt-IS

Name:	WIS4Flex
Description	Within OneNet, Watt-IS developed two Data Exchange Platforms for the Portuguese DSO and TSO, allowing them to achieve a more coordinated and optimized information exchange process, regarding flexibility availability and needs, load and production forecasting and operational planning information.
Innovativeness introduced compared to already existing Products/Services	The developments executed by Watt-IS within the OneNet project allow for a more coordinated information exchange between the Portuguese System Operators (the DSO and TSO) in what regards flexibility availability and need, load and production forecasting and operational planning information. These new data exchange processes improve significantly the existing processes and are one of the missing pieces to enable a dynamic flexibility services market in Portugal.
Unique Selling Point USP - Unique Value Proposition UVP	The developments carried out by Watt-IS make part of a product/service being developed (WIS4Flex) that is based on the application of AI-powered data analytics on top of smart metering data (that is already being collected by the DSOs) and is aimed to support DSOs and Flexibility Service Providers (FSPs) to have a quantification of the flexibility potential they have on their network or customer base.

WIS4Flex leverages on AI-powered data analytics, involving load forecasting, non-intrusive load monitoring and flexibility forecasting modules and using only smart metering data will allow DSOs and FSPs to quantify existing flexibility in their network (for DSOs) and their customer base (for FSPs).

This solution will make possible that a new layer of knowledge may be created for these stakeholders regarding the flexibility availability to place in possible ancillary services market for the DSOs. The DSO will be able to use the information about available flexibility in specific network nodes to better plan future investments in the grid seeking to use flexibility assets at a lower cost than large CAPEX allocations, which will allow to optimize capital allocation.

FSPs will be able to understand and quantify existing flexibility potential that they may possess in their customer base that they can commit to in flexibility |

	markets, and to identify the most suitable clients to involve on demand response programs.
"Market" – Customers	WIS4Flex is being developed taking into account the needs of DSOs and FSPs with the possibility to be made available in a Data Analytics as a Service (DAaaS) approach (in situations where it will be integrated on existing data analytics processes) or integrated with a visualization front-end to be adaptable to the needs of different stakeholders.

In a DAaaS approach WIS4Flex will be made available through APIs so that it may be integrated in already existent processes from DSOs or FSPs. When coupled with a dedicated visualization layer (provided in a SaaS approach), WIS4Flex users will be able to access flexibility quantification and forecasting information from their customer base in a map-based view. |
| "Market" - Solution already on the market | Cybergrid, Piclo |
| Go to Market – Use model | The data analytics market for flexibility services is growing since in different markets, as there are still regulatory barriers to the creation of dynamic flexibility markets. Given that this is a market where the main stakeholders are typically risk averse (DSOs) with regulated activities, we envisage that the most suitable channels for the promotion of WIS4Flex are specialized industry fairs and targeted recommendations from already existent partners and clients.

It is our expectation that the participation in OneNet will allow us to reach out to other possible stakeholders (DSOs or FSPs) that may be interested in applying WIS4Flex in their own markets. Additionally, through OneNet we will be able to demonstrate to other stakeholders our technical capacity to perform extensive data integration processes focused on flexibility markets, which are typically required in heavy IT legacy systems. We want therefore to position ourselves as an enabler for flexibility services and we strongly believe that the experience gained through the OneNet project will strengthen us towards that objective.

WIS4Flex is currently just available on a DAaaS approach, and we still need to allocate some time and human resources to develop the supporting visualization layer. |
Time to Market	6m to 12m
Open Source (yes/no)	No
Partners involved inside the consortium	E-REDES, REN/NESTER
Partners involved outside the consortium	• DSOs, TSOs, energy communities and cooperatives • scientific community • RES generators and technology providers • Local/regional/national authorities and other public bodies • EU policy makers • standardisation/regulation bodies • EU citizen and consumer organisations
How the result will be put in use (new policy, new standard, new product/service, direct	As stated previously, the developments carried out by Watt-IS within the OneNet project form a key component of what needs to exist in terms of data exchange processes between the DSO and TSO to make the flexibility market a reality by allowing an optimized and timely information exchange process of load and

industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	production forecasts, flexibility needs and availabilities, along with additional information regarding operational planning.

System Operators will be able to achieve an improved coordination through a more efficient information exchange process regarding grid "operational planning" and the provision of flexibility services which will facilitate the definition of necessary actions in order to avoid grid constraints, avoid unnecessary investments and ensure a secure, reliable and efficient grid operation.

These developments are totally aligned with the objective of achieving a smarter and more flexible electricity grid that is critically necessary to guarantee a more efficiently managed and resilient grid, enabling System Operators to have a higher capacity to incorporate additional variable renewable energy resources along with supporting the ongoing cross-sector electrification (including, EV's, heat pumps, etc.). |
Status of IPR (if applicable)	
TRL before the project	6
TRL after the project	8

2.13.7   Northeast Flow

Name:	Digital heating with flexibility services
Description	Connecting NEF's digital heating units to aggregating platform provided by Enerim and using the units as flexible resources.
Innovativeness introduced compared to already existing Products/Services	Connecting electric heating to flexibility markets via NEF's digital heating units. Provides flexible resources with predictable consumption.
Unique Selling Point USP - Unique Value Proposition UVP	The heating-customer will experience the benefit by reduced cost in heating. The participants in electricity trading & transferring benefit from flexibility and cost.
"Market" – Customers	Aggregators/FSP's, end customers (heating customers), DSO's, TSO's
"Market" - Solution already on the market	Not identified
Go to Market – Use model	1. which type of channel do you want to use to reach the identified customers: Using outbound/inbound strategy for heating customers and other existing contacts for "electricity network".

2. which type of resources needed for going to the market: Mostly a FSP |
Time to Market	~0,5-2 year
Open Source (yes/no)	no
Partners involved inside the consortium	Fingrid, Enerim, Vattenfall, KSOy

Partners involved outside the consortium	- DSOs, TSOs, energy communities and cooperatives - scientific community - RES generators and technology providers - consumers (households, businesses, industry) - Local/regional/national authorities and other public bodies
How the result will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	Northeast Flow Oy is going to continue working on developing the implementation of flexibility services to its digital heating services. The result can be used for development in NEF's growing customer base.
Status of IPR (if applicable)	-
TRL before the project	1
TRL after the project	3

2.13.8 ADREE by Artelys

Name:	Built a SaaS solution
Description	The ADREE tool is built as an online software that is accessible from anywhere with a web browser and an internet connection. It allows to select data from the Transparency platform to be cleaned, and external weather data used to perform the outliers detection and correction. A manual mode allows to directly upload a csv file containing the data to clean.
Innovativeness introduced compared to already existing Products/Services	Solution dedicated to the Transparency platform data with models trained on the generation and consumption timeseries of the platform. The solution is easily customizable with new models and data types and can be readily deployed as a SAAS.
Unique Selling Point USP - Unique Value Proposition UVP	A simple and robust way of cleaning energy data sets. The cleaning method combines ML and user interventions (Human in the loop)
"Market" – Customers	DSOs, TSOs, Aggregators, Researchers, Regulatory Authorities.
"Market" - Solution already on the market	Heka by Sia Partners
Go to Market – Use model	- Need to present the tool to potential users to convince them. - Need to refine the tool to make it ready for market/user needs
Time to Market	2 months
Open Source (yes/no)	No
Partners involved inside the consortium	ENTSO-E

Partners involved outside the consortium	No
How the result will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	License agreement and access to the new product.
Status of IPR (if applicable)	Artelys is the sole owner of the solution.
TRL before the project	5 (Technology validated in relevant environment)
TRL after the project	7 (System prototype demonstration in operational environment)

2.13.9 RUNADMTS by PRESIFY

Name:	Detection of Anomalies in ENTSO-E Datasets
Description	The developed services determine whether different types of time series such as consumption, generation, transmission in the ENTSO-E environment contain anomalies for each region. In this way, troublesome situations in the data will be determined.
Innovativeness introduced compared to already existing Products/Services	In the market, multi-purpose anomaly detection services have already been in use. Google Cloud Anomaly Detection offers unsupervised anomaly detection service on time series data. Another well-known service is Azure Anomaly Detector which detects the incompatible patterns in the dataset. The service we develop, on the other hand, takes effect of the seasonality into consideration and focuses on the datasets in the ENTSO-E database which makes it a tailor-made service. In this way our service is more niche and well suited for the problem.
Unique Selling Point USP - Unique Value Proposition UVP	The main role of our service is to find outliers or extreme values in the dataset from ENTSO-E. By doing this, one can purify the given dataset by removing extreme values and anomalies to create and train more trustworthy and reliable machine learning models. Another benefit is regarding data analytics and getting insight from the data. Removing anomalies makes data inspection more reliable so that we can get a better representation and ins
"Market" – Customers	The customer candidate for the service would be ENTSO-E.
"Market" - Solution already on the market	Azure Anomaly Detector and Google Cloud Anomaly Detection are general-purpose anomaly detection services in the market.
Go to Market – Use model	1. Traditional (direct sales) to ENTSO-E

2. Time (in order to extensively test the product) and expertise (ENTSO-E expertise to modify service) |
| Time to Market | Immediately |

Open Source (yes/no)	Yes. Presify team has developed these services entirely on their own. The related codes will be shared with OneNet consortium. Data Fetcher: https://github.com/presify/onenet-datafetcher Anomaly Detection Service: https://github.com/presify/onenet-anomalydetection
Partners involved inside the consortium	Not applicable
Partners involved outside the consortium	• DSOs, TSOs, energy communities and cooperatives • RES generators and technology providers • Local/regional/national authorities and other public bodies • EU policy makers
How the result will be put in use (new policy, new standard, new product/service, direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc.)	The insights provided by the anomaly detection service could be used to inform the development of new policies or standards aimed at improving data quality and reliability. If the customer finds anomaly detection service unique and innovative, it may be possible to apply for a patent to protect the intellectual property. If the anomaly detection service is successful, it may be possible to transfer the technology or license it to other companies or organizations.
Status of IPR (if applicable)	None. There is no application for IPR.
TRL before the project	TRL 2
TRL after the project	TRL 6

3 Exploitation Plans of OneNet Partners

In this first version of the document, this chapter is not yet filled in. In the next version (D13.7), due at the end of the project, we will include information on how each partner plans to exploit the results given in Chapter 2.

It is self-evident that each OneNet partner is interested in only a subset of the KERs, as shown symbolically in Table 2. Table 2 identifies per partner which KERs they plan to exploit. Hence, the intention is that, in D13.7, there will be 73 sub-chapters in this Ch. 3, one per OneNet partner and that each sub-chapter should contain a business plan on a per-partner / per KER basis, part of which is a marketing plan, which shows how the partner will exploit the given KER.

Partner ↓	KER →	KER1	KER2	…	KERn
P1	x			
P2				x
…				
P73	x	x		

Table 2: Matrix of Partners and KERs

4 Conclusions

This first version of the OneNet Exploitation and Marketing Plan has focussed on identifying the project's main results on a per-WP basis, and providing at least basic data on them, such as a description and the TRLs before and after the project. For many of the identified results, a fuller analysis has been made, identifying the target market, the marketing channel and the resources needed.

In OneNet, an open-source approach has been recommended to partners for software results. The core OneNet IT software results produced by WP5 and WP6 are open source. The software results produced by the demos are open source in some cases.

Most of the results are at TRL 7 or 8, indicating that many of the OneNet results are at an advanced stage of development and verification.

This deliverable presents OneNet's results. However, the identification of the Key Exploitable Results, i.e. selection and prioritisation of the key results, has not yet been done at this stage In the remaining year of the project, it is planned to hold two project-internal exploitation workshops in order to elaborate this work and produce a business plan on a per-partner / per-KER basis, which will be reported on in the final version of this deliverable.

References

[1] Managing Project Results in the Horizon Results Platform, European Commission, https://webgate.ec.europa.eu/funding-tenders-opportunities/display/IT/Managing+Project+Results+in+the+Horizon+Results+Platform

[2] Dissemination and Exploitation in Horizon 2020: H2020 Coordinators' Day, Kirsti Ala-Mutka https://ec.europa.eu/research/participants/data/ref/h2020/other/events/2017-03-01/8_result-dissemination-exploitation.pdf

[3] "Report on the activities of the open call", Deliverable 12.1, OneNet H2020 EU Project, 2022, https://onenet-project.eu/wp-content/uploads/2022/12/OneNet_D12.1_v1.0.pdf

[4] "Data Management Plan" OneNet H2020 EU Project, 2023, https://onenet-project.eu/public-deliverables/