



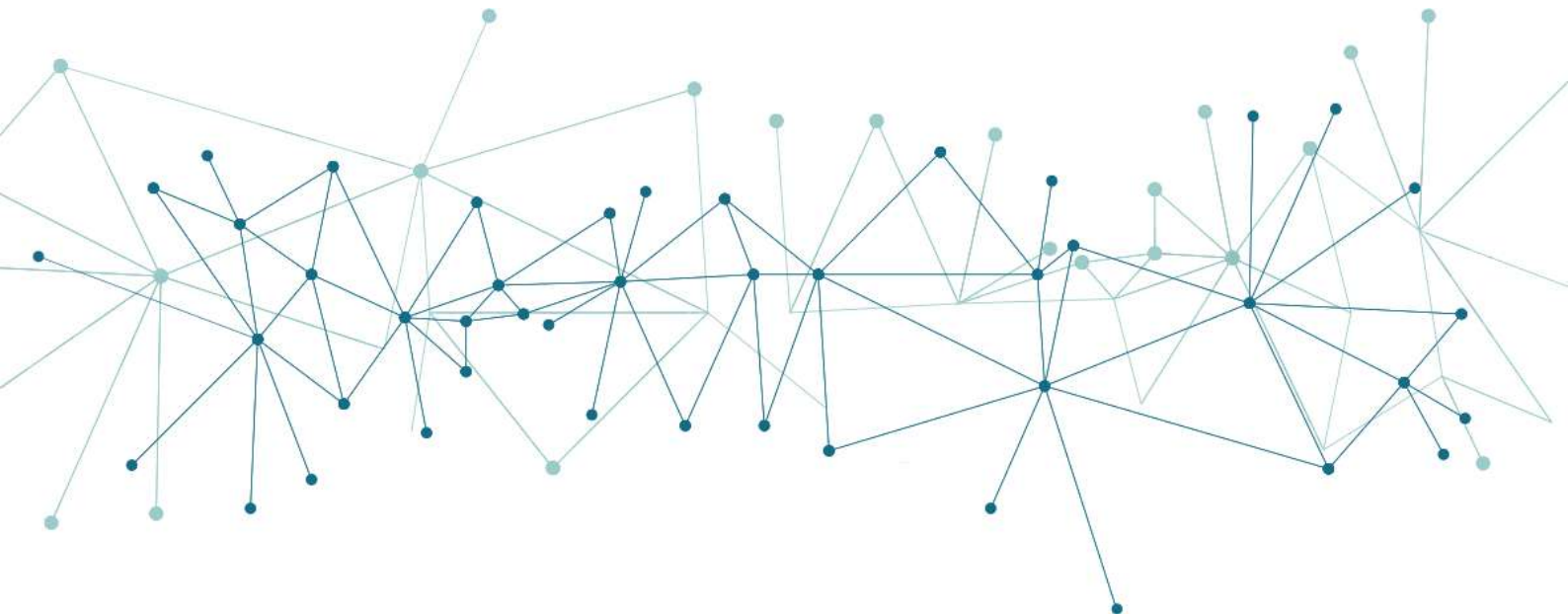
The eDREAM project is co-funded by the EU's Horizon 2020 innovation programme under grant agreement No 771478  Ref. Ares(2019)4093499 - 27/06/2019



enabling new Demand REsponse Advanced, Market oriented and secure technologies, solutions and business models

DELIVERABLE: D8.4 Exploitation Report and IPR Protection Plan V1

Authors: Giuseppe Raveduto, Vincenzo Croce



Imprint

Title of Deliverable, Month Year

Contractual Date of Delivery to the EC: 30.06.2019

Actual Date of Delivery to the EC: 30.06.2019

Author(s): Giuseppe Raveduto (ENG), Vincenzo Croce (ENG)

Participant(s): Antigoni Noula (CERTH), Fathi Abugchem (TU), Dara Kolajo (KIWI), Ugo Stecchi (ATOS), Giuseppe Mastandrea (E@W), Francesca Santori (ASM), Ionut Anghel (TUC), Andrei Ceclan (SVT), Francesco Bellesini (EMOT)

Project: enabling new Demand Response Advanced, Market oriented and secure technologies, solutions and business models (eDREAM)

Work package: WP8 – Dissemination and exploitation

Task: 8.3 – Exploitation Strategy and IPR Management

Confidentiality: public

Version: 1.0

Legal Disclaimer

The project enabling new Demand Response Advanced, Market oriented and secure technologies, solutions and business models (eDREAM) has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 774478. The sole responsibility for the content of this publication lies with the authors. It does not necessarily reflect the opinion of the Innovation and Networks Executive Agency (INEA) or the European Commission (EC). INEA or the EC are not responsible for any use that may be made of the information contained therein.

Copyright

© Engineering Ingegneria Informatica S.p.A. Copies of this publication – also of extracts thereof – may only be made with reference to the publisher.

Executive Summary

This document constitutes the first deliverable of Task 8.3 and as such presents:

- the project assets, and
- the strategy for their valorisation.

As already described in D8.1 *“Plans for the dissemination, exploitation & communication of project results”*, the eDREAM goal is to achieve the widest possible development and validation, in order to enable the possibility for a pre-commercial exploitation.

The preliminary analysis of the potentially exploitable outputs started early in the project lifetime, aiming to define the value proposition, create awareness and engage interested communities.

The final exploitation strategy, defining the management of the project results' exploitation will be presented in D8.8 *“Exploitation Report and WP8 IPR Protection Plan V2”*, together with the identification of the best utility industry and market structures offering the best opportunity in terms of development of eDREAM solutions in D8.6 *“Policy Recommendations & Best Practices for Internal Electricity & Retail Market”*, in the last month of the project.

Table of Contents

Table of Contents	4
List of Figures	5
List of Tables	6
List of Acronyms and Abbreviations.....	7
1 Introduction	8
1.1 Intended audience.....	9
1.2 Relation with other activities	9
1.3 Document overview	9
2 Market Analysis.....	10
2.1 Context	10
2.2 SWOT Analysis	13
3 Exploitation Strategy.....	15
3.1 Value proposition	15
3.2 Individual exploitation.....	17
4 Project Assets.....	28
5 Conclusions.....	30
6 References	31

List of Figures

Figure 1: Overall eDREAM methodology.....	8
Figure 2: the value proposition canvas for eDREAM local flexibility marketplaces	16
Figure 3: the value proposition canvas for eDREAM local P2P energy marketplaces.....	16
Figure 4: the value proposition canvas for eDREAM VPP optimization framework through dynamic coalitions	17

List of Tables

Table 1: D8.4 relations with other deliverables	9
Table 2: Domestic user price composition	11
Table 3: EE price the in protected market, net of system charges and taxes	12
Table 4: EE price in the free market, net of system charges and taxes	12
Table 5: Energy price with zero, 5%, and 10% TSO costs	13
Table 6: preliminary SWOT analysis for eDREAM project	14
Table 7: preliminary exploitation plan	15
Table 8: ENG individual exploitation plan	17
Table 9: CERTH individual exploitation plan.....	18
Table 10: TU individual exploitation plan.....	19
Table 11: KIWI individual exploitation plan.....	20
Table 12: ATOS individual exploitation plan	21
Table 13: E@W individual exploitation plan	23
Table 14: ASM individual exploitation plan.....	24
Table 15: TUC individual exploitation plan.....	25
Table 16: SVT individual exploitation plan	26
Table 17: EMOT individual exploitation plan	27
Table 18: eDREAM’s assets, ownership and expression of interests for joint ownerships	28

List of Acronyms and Abbreviations

AEEG	Autorità Per L'Energia Elettrica E Il Gas (Italian: Authority For Electricity And Gas)
AR	Augmented Reality
BEM	Building Energy Management
DNO	Distribution Network Operator
DR	Demand Response
DSO	Distribution System Operator
DSS	Decision Support System
EC	European Commission
EDREAM	Enabling New Demand Response Advanced, Market Oriented And Secure Technologies, Solutions And Business Models
ESCO	Energy Service Company
EU	European Union
HMI	Human Machine Interface
ICT	Information And Communication Technology
IP	Intellectual Property
IPR	Intellectual Property Rights
KPI	Key Performance Indicator
LIDAR	Light Detection And Ranging
LV	Low Voltage
P2P	Peer-To-Peer
PUN	Prezzo Unico Nazionale (Italian: Single National Price)
PV	Photo-Voltaic
RES	Renewable Energy Source
SCADA	Supervisory Control And Data Acquisition
SWOT	Strengths, Weaknesses, Opportunities And Threats
TRL	Technology Readiness Level
TSO	Transmission System Operator
VPP	Virtual Power Plant
WP	Work Package

1 Introduction

The overall approach and methodology for the eDREAM project consist of four interrelated phases (Figure 1):

1. Phase one: *Definition of Domain, Detailed Requirements & Business Scenarios, and Requirements Tracking*
2. Phase two: *Research and Development & Prototyping*
3. Phase three: *Integration, Technology Validation & Lessons Learned, Business Models*
4. Phase four: *Project Management, Dissemination & Exploitation*

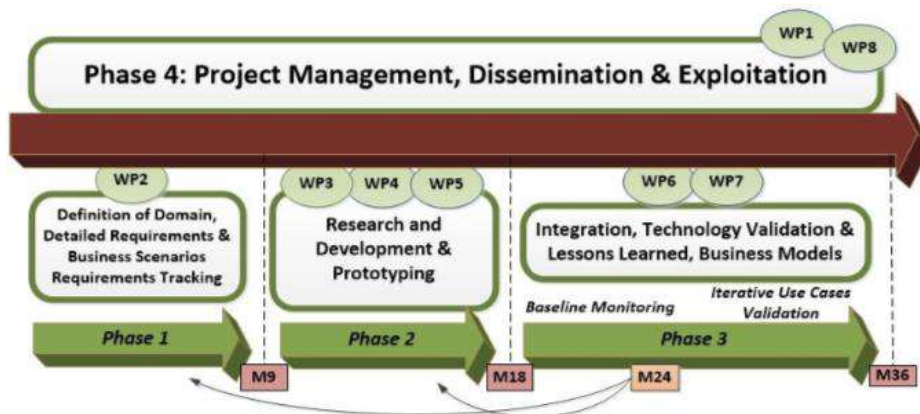


Figure 1: Overall eDREAM methodology

The phase four includes all the horizontal activities of the project. In particular, WP8 focus on:

- Dissemination, exploitation and communication plans;
- Dissemination activities and eDREAM's social media presence;
- Development of eDREAM business modelling and replication plans;
- Policy recommendations and best practices for internal electricity and retail market.

1.1 Intended audience

The dissemination level of the present document is marked as public.

The information reported here can be useful to consortium partners to provide insights and the initial blueprint of the necessary steps towards exploiting the project's results while going forward a market-ready solution based on the innovative technologies and business models developed within the project.

Moreover, this document will inform the EC personnel about the market potential of the eDREAM solution, as well as the exploitation impact and future plans after the project official completion.

1.2 Relation with other activities

This deliverable reports on the initial exploitation activities, after the initial analysis performed in D8.1 *"Plans for the dissemination, exploitation & communication of project results"*.

This document will be followed by D8.8 *"Exploitation Report and IPR Protection Plan V2"* (M36), which will describe the consolidated project assets, the strategy for assets valorisation and IPR protection plan and potentially related patents to be applied. Table 1 lists the relations with the deliverables.

ID	Title	Type	Relation
D8.1	Plans for the dissemination, exploitation & communication of project results	Input	Overall plan including target groups identification, general strategies to be applied
D8.8	Exploitation Report and IPR Protection Plan V2	Output	Consolidated definition of project assets, consolidated strategy for valorisation, IPR protection plan

Table 1: D8.4 relations with other deliverables

1.3 Document overview

This report is organized as follows:

- Section 2 presents an initial market analysis, to be developed through the second half of the project,
- Section 3 introduces the initial exploitation strategy, drafting the project's overall value proposition and the individual exploitation strategy indicated by the project partners,
- Section 4 presents the preliminary list of identified project assets, together with the expression of interests for joint exploitation activities; This will be further detailed in D8.8 where the IPR Protection Plan will be consolidated.
- Section 5 draws conclusions and next steps planning.

2 Market Analysis

The European Quarterly Report on European Electricity Markets¹ reports:

- Economic growth decelerated for a fifth quarter in a row but remained positive at about 1.5%. Electricity consumption in Q4 2018 in the EU showed a measured increase in year-on-year comparison by about 1.2%, mainly driven by industrial demand as heating needs were lower than usual due to mild meteorological conditions.
- Carbon prices continued their upward trend in Q4 2018 and at of the year they crossed above 25 €/tCO_{2e} for the first time, as market players continued to price in the changes in the Market Stability Reserve (MSR) of the European Emission Trading System.
- Industrial prices for electricity remained on a diverging path across the EU for all monitored consumer bands. Industrial prices in the EU were lower than in Japan, on par with China and Korea but more expensive than in the US by about 40 €/Mwh.
- The energy component of prices paid by households increased in all but four Member States from September 2017 to September 2018, including Germany and Spain, two countries with a relatively high share of variable renewable energy. Network charges and taxes remained stable across the EU on a y-o-y comparison.

These elements contribute to the shaping of the eDREAM project context and give the overarching reference of the European scenario on respect of the worldwide scenario.

2.1 Context

Italian outlook

Initial context analysis focussed on Italian perspective as potential exploitable market. Engineering, through its dedicated internal business unit, started to study the context of innovative ways to sell electricity. The initial study focuses on the Italian market. The results are reported below:

The reference regulatory framework is particularly complex and derives from Directive 96/92/EC of the European Parliament and of the Council of 19 December 1996 concerning "common rules for the internal electricity market". The Directive has been implemented in Italy through Legislative Decree 79/99 of 16 March 1999. Under Legislative Decree 79/99, Italy is one of the European countries which has shown to believe in the liberalisation of the electricity market regulating production, transmission, distribution and sale activities.

The Decree envisaged:

1. a national transmission grid operator, a market operator and an electricity exchange for the wholesale market (GRTN & GME);
2. a free market and a captive market;
3. a single buyer for supplies to the captive market (AU);
4. a 50% ceiling on the production and imports of the dominant firm (ENEL);
5. a new regime for distribution services with:
 - a maximum of 30 years for concessions;
 - the aggregation of urban grids divided between ENEL and municipalised firms in a single distribution company assigned to the latter;

6. the "de-verticalization" of ENEL, implemented through its transformation into a joint-stock company and the creation of a holding company with separate companies at management level for production, transmission, distribution and sale activities to eligible end customers;
7. the end of ENEL's legal monopoly, authorising new parties to enter the production, distribution and sale markets for electricity;
8. the figure of eligible customers: parties authorised to purchase electricity on the free market with progressive access thresholds up to including all customers from 1 July 2007.

With the consolidated right of every end customer to purchase electricity from any qualified supplier two scenarios take shape:

1. the current scenario through the complete supply chain (producer, transmission, distribution, consumer)
2. direct relationship without transmission and/or distribution activities (producer, consumer).

Directive 2012/27/EU of the European Parliament and of the Council, dated 25 October 2012, on energy efficiency, which amends Directives 2009/125/EC and 2010/30/EU and repeals Directives 2004/8/EC and 2006/32/EC, has been transposed in Italy by Legislative Decree No. 102 of 4 July 2014 – "*Implementation of Directive 2012/27/EU on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC*".

Following the liberalisation of the energy market in 2007, all customers have the freedom to choose their preferred electricity supplier. Those who have decided not to switch to the free market can still remain in the market regulated by the Electricity and Gas Authority ("*protected market*"). This is at least until June 2019, when the process of liberalising the energy market will be completed.

Table 18 shows the economic conditions of supply for a typical domestic consumer (committed power 3 kW and annual consumption 2,700 kWh) in the protected market².

Economic conditions of supply for a family with 3 kW of committed power and 2,700 kWh of annual consumption						
c€/kWh	Expenditure on energy		Expenditure on transport and meter management	Expenditure on system charges	Taxes	Total
	Energy supply	Retailing				
I 2018	8,349	1,6743	3,8675	4,053	2,6822	20,626
II 2018	6,647	1,6743	3,8675	4,2593	2,5326	18,9808
III 2018	8,81	1,6743	3,8675	3,2200	2,65	20,2218
IV 2018	10,205	1,6743	3,8675	3,2239	2,7849	21,7556
I 2019	9,05	1,7780	3,9150	4,213	2,7830	21,7390
II 2019	6,634	1,7780	3,9150	4,948	2,615	19,89

Table 2: Domestic user price composition

In the free market every seller, in theory, has full autonomy in determining the selling price, but in reality, only acts on the price of the energy component, as the costs of network services and other components are fixed by the AEEG, being the only transmission and distribution network in the territory.

A platform that aggregates and correlates the offers of producers and the demands of buyers, would be an innovative way to sell and buy electricity. In order for this platform to be competitive, the selling price of electricity must be lower than that offered on the free and protected market. Some of the items of expenditure that make up the final price are incurred regardless of the type of market in which you are located; these are expenses for system charges and taxes. In the case of the sale of energy through an aggregation platform, the items of expenditure related to the TSO could decrease or even be zeroed.

c€/kWh	Expenditure on energy		Expenditure on transport and meter management	Total
	Energy supply	Retailing		
II 2019	6,634	1,7780	3,9150	12,327

Table 3: EE price the in protected market, net of system charges and taxes

To determine the price in the free market, we consider the PUN (Wholesale price broke down by time slot and variable monthly) of April 2019 which is 5,335 c€/kWh³. A "fee" is added to the PUN to cover the costs of marketing the distributor and the costs of transporting and operating the meter. So, if we assume a "fee" of 1,0 c€/kWh, we have (Table 4):

c€/kWh	Expenditure on energy		Expenditure on transport and meter management	Total
	PUN	Fee		
April 2019	5,335	1,0	3,9150	10,25

Table 4: EE price in the free market, net of system charges and taxes

In order for the platform to be competitive on the market, it must be offered at a price lower than that of the free market (10,25€/kWh in our simulation), and consequently also than that of the protected market (12,327c€/kWh in our simulation). It is assumed that the operating costs of the platform are covered by a "fee" equal to 1 c€/kWh (there is no benchmark for this value as it is an innovative proposal).

On the other hand, with regard to the costs of transport and management of the meter, we make three assumptions:

- Hypothesis 1: Relative costs TSO=0
- Hypothesis 2: Relative costs TSO=5%
- Hypothesis 3: Relative costs TSO=10%

Based on the data published by AEEGSI, it is estimated that the weight of the cost items of the transmission service on the electricity bill of a typical domestic user is approximately 3,3%⁴. So, knowing that the costs for transport and management of the meter are 19,68%² of the total expenditure for energy, we have that the expenditure relating to the TSO is equal to 16.77% while that relating to the DSO alone is equal to 83.23%.

c€/kWh	Expenditure on energy		Expenditure on transport and meter management		Total	
	Energy price	Fee	TSO	DSO 80,18%		
April 2019	X	1	0%	0	3,258521	<10,25
			5%	0,19575		
			10%	0,3915		

Table 5: Energy price with zero, 5%, and 10% TSO costs

Therefore, under the conditions that the costs of transport and management of the contactor are those relating only to DSO, to ensure that the platform is competitive on the market, the energy price must be less than 5,9915 c€/kWh, with this second hypothesis the price must be lower than 5,79575 c€/kWh, and with the last hypothesis the price of the raw material must be less than 5,6 c€/kWh.

Calls for Energy Efficiency

The EU 20-20-20 targets, aiming to reduce emissions and energy consumption, while increasing energy efficiency by 2020⁵, were endorsed by the European Council in 2007 and implemented through the EU climate and energy package in 2009 and the energy efficiency directive in 2012. At the same time, The EU is advancing towards its 2020 and 2030 energy and climate targets, aiming to build an Energy Union based on secure, affordable and climate-friendly energy⁶.

European Energy Marketplaces

The European wholesale energy markets can be categorized considering both the timeframe and the traded item. Considering the timeframe, they can be classified into *forward markets* or *real-time markets*. The forward markets can be further classified into *intra-day markets* and *day-ahead markets*. Considering the traded item, they can be classified into *energy markets* (in which the energy is traded among providers and consumers) or *balancing markets* (in which ancillary services are offered to DSOs to ensure grid stability).

Regional Markets

The EC has identified the need for a regional approach: the regional market integration should continue as a decisive step towards the ultimate consolidation of a single energy market across the EU. Moreover, a well-connected integrated energy market is seen as the basis for the decarbonisation of our energy systems in a cost-efficient way⁷.

2.2 SWOT Analysis

A SWOT analysis examines the Strengths, Weaknesses, Opportunities and Threats for a project. It helps to define an objective determining what factors may support (Strengths and Opportunities) or hinder (Weaknesses and Threats) it.

While Strengths and Weaknesses are internal factors, Opportunities and Threats are external.

Internal Factors	
Strengths (+)	Weaknesses (-)
<ul style="list-style-type: none"> • Gain benefits from marketplace participation • Contributions to grid stability through dynamic coalitions of prosumers • Contributions to grid stability through DR programs • Contribution to local energy markets development • Promotion of RES integration 	<ul style="list-style-type: none"> • P2P marketplace depends on national and/or regional energy regulations • Aerial surveying may depend on national regulations (e.g. “no fly zones”)
External Factors	
Opportunities (+)	Threats (-)
<ul style="list-style-type: none"> • EU directives for carbon emissions reduction • Increasing RES integration • Increasing usage of smart meters favours market decentralization and new business models 	<ul style="list-style-type: none"> • Blockchain technologies may be subject to future regulations • Emerging of other IT solutions preferred by the market

Table 6: preliminary SWOT analysis for eDREAM project

Table 6 presents the preliminary SWOT analysis for eDREAM project. It will be updated and consolidated as the project progress and will be included in D8.8 “Exploitation Report and IPR Protection Plan V2”

3 Exploitation Strategy

An initial analysis of eDREAM's exploitable results, was presented in D8.1 "*Plans for the dissemination, exploitation & communication of project results*" and updated in this report. The preliminary analysis is reported in Table 7.

Exploitable results	Type	Owners	Foreseen exploitation
eDREAM integrated solution	platform	ALL	
Tools for demand response optimal programs design, including DR forecast, profiling, segmentation and load forecasting	tool	ENG, CERTH, TU, ATOS, TUC, KIWI, E@W	Consolidated definition of project assets, consolidated strategy for valorisation, IPR protection plan, Potential patent application / Part of joint exploitation plans or adaptation for new RTD, innovation or pre-commercial projects.
Blockchain DR verification and financial settlements	application	ENG, TUC	Part of joint exploitation plans or adaptation for new RTD, innovation or pre-commercial projects.
Blockchain Services for Electronic Registration, Transacting and Processing of Assets	software	ENG, TUC	Copyright / Part of joint exploitation plans or individual exploitation for commercial purposes.
Graph-based analytics for Closed- Loop DR optimal scheduling and Hypothesis Testing	application	CERTH	Potential patent application / Part of joint exploitation plans or adaptation for new RTD, innovation or pre-commercial projects.
Community-based VPP	application	CERTH, ENG, TUC, ASM, KIWI	Part of joint exploitation plans or individual exploitation for commercial purposes.
Business models for DR	methods	E@W, SVT	Part of joint exploitation plans or individual exploitation for commercial purposes.

Table 7: preliminary exploitation plan

In D8.1, the eDREAM exploitation strategy was split into two paths. The first path, *joint exploitation*, defines the long-term vision for the assets constituting the project value proposition, while the second path, *individual exploitation*, enables each partner to take the project results and exploit them on their own ends.

3.1 Value proposition

The eDREAM unique selling proposition can be identified as a novel blockchain based Demand Response decentralized ecosystem, aimed at either alleviating power grid local network constraints in real time caused by the imbalances or optimizing nearby energy management.

The eDREAM offering will be made available through three main project's assets:

- **Local flexibility marketplaces**, tailored specifically to DSOs and aggregators stakeholders;
- **Local peer-to-peer energy marketplaces** tailored to prosumers and aggregators;
- **VPP optimization framework** through dynamic coalitions, tailored to aggregators.

The eDREAM value proposition can be analysed through the following *Value Proposition Canvas*:

- Figure 2: Local flexibility marketplaces;
- Figure 3: Local P2P energy marketplaces;
- Figure 4: VPP optimization through dynamic coalitions.

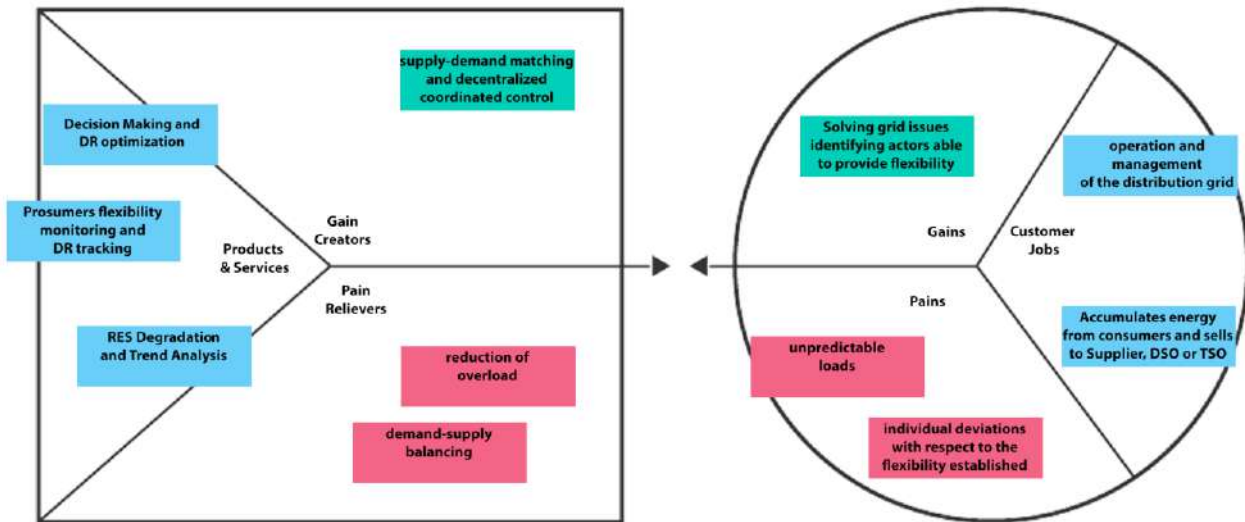


Figure 2: the value proposition canvas for eDREAM local flexibility marketplaces

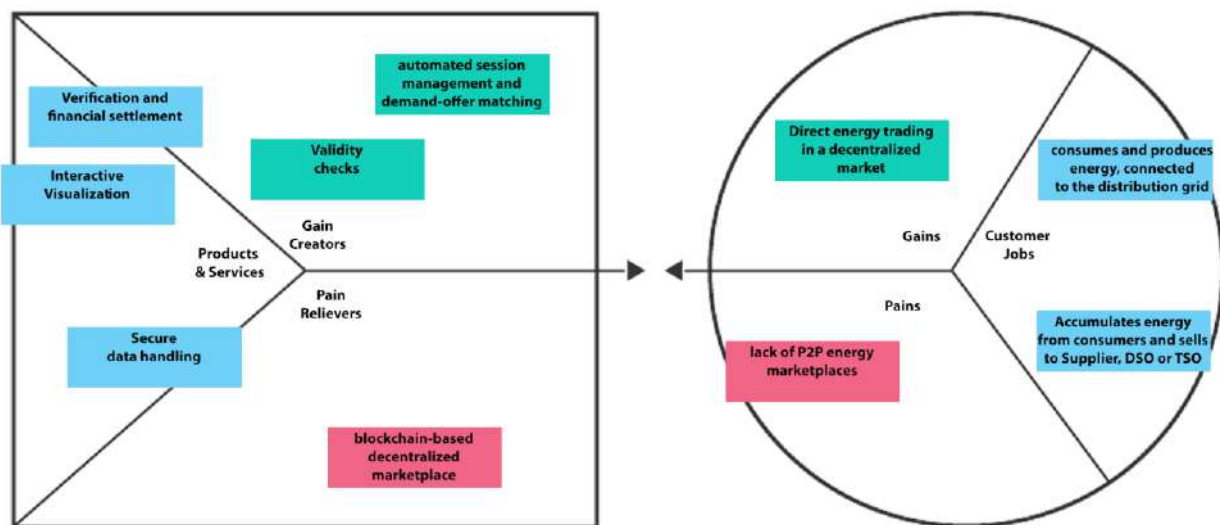


Figure 3: the value proposition canvas for eDREAM local P2P energy marketplaces

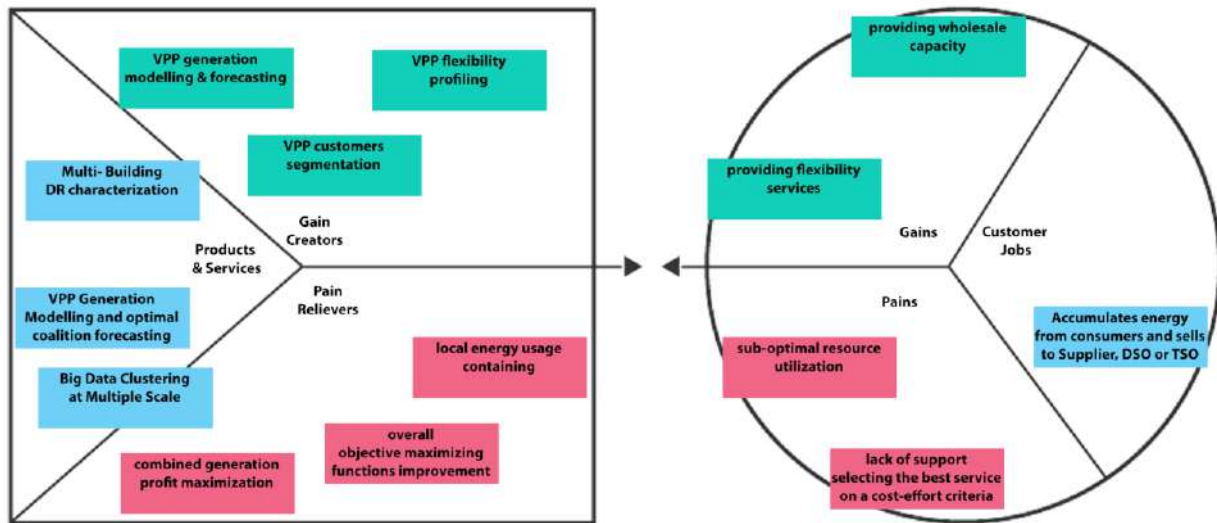


Figure 4: the value proposition canvas for eDREAM VPP optimization framework through dynamic coalitions

3.2 Individual exploitation

This section provides the eDREAM partners' individual exploitation plans. An initial set of the individual exploitation plans was included in D8.1. The following tables were updated by each partner after the initial definition, to include the latest developments.

Partner	ENG
Organisation profile	Enterprise
Strategic focus areas	IT Services
How is eDREAM project relevant to your organisation	Engineering has a dedicated business unit for the Energy & Utilities market and has developed also its own software suite for the Utilities market. eDREAM project outcomes could be part of the suite.
What content could be exploited?	Both material (platform tools) and immaterial assets (knowledge, methodologies, requirements etc.)
Approach to exploitation	<p>Start a technology transfer process towards the dedicated Business Unit, describing the identified scenarios, business requirements and stakeholders.</p> <p>Engineering will participate to the exploitation of the assets being part of the project value proposition. Moreover, will leverage the new developed blockchain-based components for the secure energy data storage and the DR verification and financial settlement through individual or joint exploitation activities even considering data handling exploitable framework.</p>

Table 8: ENG individual exploitation plan

Partner	CERTH
Organisation profile	Research Institute
Strategic focus areas	Energy and ICT sector
How is eDREAM project relevant to your organisation	Contribution to the design of innovative algorithms, techniques and visualization tools concerning data analysis of microgrids and market operation and interaction with stakeholders.
What content could be exploited?	<ul style="list-style-type: none"> • Deep learning techniques for electricity consumption/production forecasting • Aerial survey techniques for DR estimation; • DR Optimization and Scheduling toolkit; • We will examine synergies with National & European stakeholders (we already talk with Energy Utilities and DSOs in Greece and Germany) for further exploitation; • Open Days at CERTH premises, Participation in Researchers Night (yearly) and HELEXPO (yearly); • Strategic participation in Energy related Events.
Approach to exploitation	<p>1) Exploitation through existing spin-offs of the Institute dealing with IoT domain, 2) Use as basis for follow-up R&D projects, 3) Joint exploitation some of the bundle tools together with other project partners</p> <p>The development of quite accurate forecasting algorithms concerning the energy related data will enable us to deliver powerful tools for the energy market stakeholders. Aggregators will be able to forecast the electricity demand and supply of the registered prosumers by using these tools, so as to apply efficiently the proper DR strategy.</p> <p>These techniques will provide the possibility of pre-assessment for Demand Response programs. It will be a useful tool for utility companies for identifying possible prosumers with remarkable production potential examining the building assets.</p> <p>eDREAM allows CERTH to investigate different techniques to improve the Front-End part of platforms dedicated to energy market. The focus area is the creation of multi-level and multi-factor visualization framework for energy market stakeholders (aggregators, DSO, prosumers etc.) towards improving their portfolio management. Through the research activities during DREAM project, CERTH will improve its correlation algorithms for multi-factor analysis and will evolve existing Augmented Reality (AR) tools. These research and development processes will extend the specialization areas of CERTH in the visualization part of ICT platforms enabling us to collaborate with relevant enterprises in the energy sector.</p> <p>All the above techniques and tools will be also fully exploited in the Digital Innovation Hub of Smart Home at CERTH's premises.</p> <p>Possible ways for the exploitation can be through licensing (royalties), either through the creation of spin-offs, either through existing spin-offs.</p> <p>During these activities, the research results concerning the advanced techniques and tools for the energy market can be diffused to relevant stakeholders.</p>

Table 9: CERTH individual exploitation plan

Partner	TU
Organisation profile	Public University
Strategic focus areas	Smart energy systems
How is eDREAM project relevant to your organisation	eDREAM provides funding for a PhD student and staff working on demand-response optimisation, baseline definition and prediction, augmented reality visualisation of energy performance and aerial surveying of demand response potential.
What content could be exploited?	<p>Patentable developments are related to LiDAR and AR integration in aerial surveying equipment.</p> <p>Additional exploitable results are related to aerial surveying services for demand response potential estimation, baseline determination and demand prediction using optimisation, interface to generic optimisation tools.</p>
Approach to exploitation	TU will follow internal procedures for IP and patent protection of its exploitable results. eDREAM project beneficiaries will be offered preferential treatment in accessing and commercialising exploitable results before exploring commercial opportunities on the open market, in accordance with the Consortium Agreement. Such opportunities include but are not limited to software licensing, licenced manufacturing, service offering accreditation etc.

Table 10: TU individual exploitation plan

Partner	KiWi
Organisation profile	Demand Response aggregator
Strategic focus areas	Flexibility services Energy Markets Turnkey solutions for Energy Management
How is eDREAM project relevant to your organisation	Any tools or services designed and developed to enhance the use of flexibility in the balancing markets and ancillary services are of interest as this will allow KiWi to maximise revenues for its existing and future customers and maximise profits for its shareholders. Also, KiWi is now a technology provider, licensing its platform to partners through Europe.
What content could be exploited?	<ul style="list-style-type: none"> • Deep learning techniques for electricity consumption/production forecasting. • Aerial survey techniques for DR estimation. • Interactive Visualization Framework for DR strategies. • DR Optimization and Scheduling toolkit
Approach to exploitation	<p>1. Better forecasting tools for energy consumption and load modelling through the application of deep learning techniques, baseline flexibility estimation as well the use of PV/RES degradation and trend analysis algorithms will allow KiWi to improve asset availability declarations for its diverse client portfolio, in various commercial programmes therefore increasing revenues and reducing the risks of penalties for under performance.</p> <p>2. The DR Aerial survey toolkit can potentially fit into KiWi's sales funnel process, enabling quick initial assessment of large industrial and commercial areas and saving time and money on costly site surveys.</p> <p>3. Visualization strategies for demand response can help potential customers of KiWi Power become more familiar with their flexibility potential, and how this flexibility can be monetised, which in turn will improve decision making. In addition, it can also help clients such as Distribution Network Operators - DNOs (to which KiWi is already a platform provider) to assess the best network constraint management strategies based on available flexibility in each district area/zone.</p> <p>4. Components such as load profiling and customer segmentation and innovative visual clustering techniques, when in correlation with relevant KPIs and multi-objective analysis; will be a very informative tool for aggregators such as KiWi Power, helping them in improving long-term demand response strategies.</p>

Table 11: KiWi individual exploitation plan

Partner	ATOS
Organisation profile	IT
Strategic focus areas	Energy
How is eDREAM project relevant to your organisation	Contribute to the provision of cutting edge solutions in the emerging digitalised energy sector.
What content could be exploited?	<ul style="list-style-type: none"> ● Clustering tools ● Framework integration
Approach to exploitation	<p>eDREAM allows Atos to dig into the different clustering tools that can be applied. The main focus of Atos is to work on assessing scalability finding the most suitable solution to be integrated in the FUSE platform. Additionally, the analysis and integration of the clustering tools will extend the expertise of Atos in the identification of Data Analysis to the energy sector of the research department enabling us to strength the collaboration with the business lines in this area.</p> <p>The integration activities that Atos will be leading in eDREAM supports the work the research department is doing developing FUSE platform. One of the main aspects to be covered in the preparation of tools and solutions for the digital energy environment is the collaboration among heterogeneous technologies, devices and data sets. Besides the work on clustering techniques that is developed in the project, the creation of common space for supporting the whole data value chain plus the integration of cutting-edge technologies like Blockchain, will strength Atos in the reliability and scalability of its solutions</p> <p>Integration in Atos Research and Innovation FUSE platform as part of the suite for utilities. The next steps will be the validation in further projects with large number of users. It has been already funded and will be starting in the second half of 2019.</p>

Table 12: ATOS individual exploitation plan

Partner	E@W
Organisation profile	Innovative non-profit start-up organisation
Strategic focus areas	<p>The core of the E@W activities is focused essentially on the development of services for the Energy Management. E@W designs and develops software solutions for the efficient and intelligent management of building automation systems and energy storage. Other main activities are related to the management of user interactions with the electricity grid with a particular focus on the design and development of Demand Response services.</p> <p>In the last 3 years, E@W has investigated and mastered the appropriate open technologies and artificial intelligence algorithms to be applied to the energy efficiency sector, with the aim to develop a stable and robust solution able to implement energy- saving strategies at the building level.</p> <p>In particular, the company solution under development optimizes the operation of the systems commonly present in large buildings (air conditioning, lighting, shading), achieving up to 20% of energy savings with limited investments taking also in consideration the user comfort.</p> <p>A system prototype, consisting of a network of sensors able to monitor user activities, environmental parameters and consumption, has been already demonstrated in the operational environment (TRL7).</p>
How is eDREAM project relevant to your organisation	<p>The E@W on-going activities are aimed to integrate Demand Response functionalities into the company solution to ensure further savings by appropriately triggering of an efficient response from an input signal such as a change in the renewable production curve, where present (or, in the future, a price curve).</p> <p>In particular, thanks to the relevant experience gained in the context of H2020 eDream project, it will be possible to integrate in the solution these specific services such as services for the optimal management of storage systems combined with renewable sources.</p> <p>These activities will lead to an evolution of the system, in accordance with the E@W business and development plans and with the relevant regulations.</p> <p>Among the expected results, the company solution must be able to interact with the loads and with the inverters of the renewable energy systems implementing on the field the energy saving and energy storage management services already under development. The future integration of these functionalities will enhance the possibility to include in the business model any profits obtained through the involvement in the DSO's DR programs.</p>
What content could be exploited?	<ul style="list-style-type: none"> • Electricity Production/Consumption forecasting tools • Baseline flexibility estimation in DR programs • Decision Making and Optimization features for Improving DR • Big Data Clustering techniques for load and generation profiling • Multi-level Visualization features for enhanced user interaction • Secure blockchain-based applications for DR management, control and financial settlement
Approach to exploitation	<ul style="list-style-type: none"> • Definition of primary and secondary customers; • Customer involvement through bilateral meetings or promotion events; • Territorial partnership agreements with complementary companies such as ESCO, System integrators and / or Building Automation - Companies, Facility Management companies; • International agreements with partners of the H2020 network; • Exploitation of the LegaCoop channel to intercept potential large customers such as COOP, CONAD etc.; • Investor search for accelerated company development. <p>Energy@Work is currently developing cloud services for optimizing energy</p>

	<p>management in commercial buildings. Currently on eDREAM is working on algorithms and tools for baseline calculation, energy forecasting, and energy data handling using ledger technologies. The main purpose for is then to valorise the acquired foreground to extend the service portfolio and intercept new categories of customers, such as utilities and aggregators. By 2020, within the planned deadline of the project, the creation of TRL7 solutions are expected. Afterwards, a Project Management plan will be defined and executed with the purpose to integrate the acquired foreground reaching the industrial maturity of solutions. In this time-windows, it is expected to valorise the know-how gaining research contracts or acquiring new projects with the aim of works still in line and above the State of the Art.</p>
--	---

Table 13: E@W individual exploitation plan

Partner	ASM
Organisation profile	Public utility company
Strategic focus areas	<ul style="list-style-type: none"> ● Electric power distribution ● Innovation ● Water distribution and waste water treatment ● Waste management
How is eDREAM project relevant to your organisation	eDREAM project is relevant to ASM in terms of new tools and services to make the distribution power network more stable and secure. The high penetration of DER in the Terni’s area has led to a significant increase of the reverse power factor in the substations and number of congestions. Matching consumption with production through secure and efficient DR strategies using blockchain technology represents nowadays one of the most promising approaches for the DSO’s grid management.
What content could be exploited?	<ul style="list-style-type: none"> ● Know how ● Community based VPP features ● DR blockchain based technologies
Approach to exploitation	<p>Concrete measures will be planned by ASM TERNI to enhance the innovation capacity and integration of eDREAM knowledge and results in its strategic focus areas. Due to its role as DSO and eDREAM pilot site, ASM TERNI is definitely committed to the eDREAM project with respect to the utilisation of the smart grid solutions developed throughout the project, both for other demonstration/innovation actions and/or for research purposes. However, in case of large scale deployment, these solutions have to meet a number of key criteria, such as to be economic and very secure, not jeopardizing power continuity. Finally, they must support applications that contribute to a positive business case in terms of grid control.</p> <p>Moreover, for a DSO the route to the market is complex and the availability of suitable network elements for deployment is probably the least difficult issue. More complex is the strategic decision to develop networks and especially secure mobile networks capable of supporting the blockchain-based DR systems proposed by eDREAM. Equally complex is the design of an operational network architecture suitable for mass heterogeneous equipment deployment, providing the necessary security operations systems and capabilities of integration with existing SCADA, IT and security systems.</p>

Table 14: ASM individual exploitation plan

Partner	TUC
Organisation profile	University
Strategic focus areas	<ul style="list-style-type: none"> ● Teaching ● Research and innovation actions
How is eDREAM project relevant to your organisation	Raise awareness about university R&D activities; Establish new potential partnerships with different stakeholders/companies/organizations; Disseminate research results in highly ranked journals/conferences; Create services for consultancy and technological transfer of research into production.
What content could be exploited?	<ul style="list-style-type: none"> ● Electricity production / consumption forecasting techniques and tool; ● Consumption flexibility models and aggregation techniques; ● Blockchain-enabled decentralized network control optimization and DR verification technologies.
Approach to exploitation	<p>The research and technical outcomes are exploited by publishing papers in conferences and journals related to project domain.</p> <p>In terms of teaching, specific presentations describing the project outcomes were made for students during academic teaching activities and to university members. Currently 5 Master theses and 2 PhD theses are carried out in the university based on the eDREAM outcomes and future developments.</p> <p>In terms of technological transfer of research into production, TUC expects to be involved in the future with consultancy activities to stakeholders for adopting, implementing and using the innovative techniques and algorithms developed within the project.</p> <p>As an education institution, the exploitation of eDREAM by Technical University of Cluj-Napoca (TUC) revolves around augmenting the research and technological capacity of the University members, spanning both students and the research staff. In this context, the techniques designed and implemented the eDREAM context will be exploited by publishing papers in conferences and journals related to blockchain and energy domains. The results and best practices inferred by developing them can potential be forwarded to respective standardization bodies.</p> <p>In terms of teaching, specific presentations describing the project outcomes were made for students during academic teaching activities and to university members.</p> <p>In terms of technological transfer of research into production, TUC expects to be involved in the future with consultancy activities to energy domain for adopting, implementing and using the innovative tools developed within the eDREAM project.</p>

Table 15: TUC individual exploitation plan

Partner	SVT
Organisation profile	ESCO
Strategic focus areas	<ul style="list-style-type: none"> • Energy efficiency solutions and services • Energy services in buildings • DRaEMS - Demand Response as an Energy Management Service
How is eDREAM project relevant to your organisation	<p>Open new frontiers on digitalization's grid; gives an integrated big picture about local communities energy profile, related to the whole urban area. This is strictly related to energy efficiency, which is our core business.</p> <p>Helps in the optimization of the energy and cost saving, if Demand Response applied. It can be a digitalized energy service provided by ESCOs.</p>
What content could be exploited?	<p>SVT will leverage project results to complement its original market positioning (ESCO) with innovative flexible load aggregation services.</p> <p>DR architecture, BEM Systems implementation and digitized solutions to implement DR in buildings. In collaboration with TUCN, we can test technologies in its public buildings, as it has an operational BEMS and Demand Response system in place.</p>
Approach to exploitation	<p>Develop cluster tools for grid digitalization in order to have predictability and scalability of the energy load local grid.</p> <p>Find the actors / See witch stakeholder are interested to invest in Energy efficiency. TUCN can use its assets, systems and experience in Demand Response in a pilot project to test and prove the objectives of eDREAM.</p> <p>SVT can implement systems and operate eDREAM solution, including in energy service packages for buildings</p> <p>SVT shall present and propose business models in different workshops and seminars related to energy markets and energy efficiency, both at national level and to other international events. At this moment, the Demand Response service has no regulation on the energy market in Romania, so the efforts will be concentrated in creating this market, by involving different stakeholders (ANRE, ESCOs, energy retailers, DSOs etc.). On the other hand, Servelect being the dissemination leader in the project, an aggregation effort will be done so as to collect all the other exploitation strategies and promote them on different channels. As an ESCO, Servelect has an increased interest in developing a business from the project outputs, to be launched and implemented in the Romanian energy market, and this will be done using the public deliverables and by addressing a proposal to the other technology partners in using the project platform, at least as a demo. Several other connections will be also established between eDREAM results and project assets and other ongoing H2020 project, in which Servelect is involved: eLAND, DR BoB, RE-COGNITION, SMEmpower Efficiency, SmartInvest, DYNAMO.</p>

Table 16: SVT individual exploitation plan

Partner	EMOT
Organisation profile	SME
Strategic focus areas	Electric Mobility
How is eDREAM project relevant to your organisation	Emotion is part of the Italian pilot providing monitoring and management services for electric vehicles and charging stations, delivering energy flexibility to the smart grid. Collaboration with the other partners of the eDREAM project for testing Demand Response campaign will allow Emotion to refine their skills and enrich their knowledge, being able to take advantage of this learning after the end of the project for its business activities. Emotion will exploit its involvement in the eDREAM project to gain knowledge on Demand Response mechanisms using Blockchain technology, with the aim of verifying if it is possible to enable secure energy trade between prosumers and owners of electric vehicles, improving the use of renewable energies, increasing the profit of prosumers and reducing costs for charging electric vehicles, thus making mobility more sustainable and economic.
What content could be exploited?	EMOT will use its involvement in the eDREAM project to gain knowledge on Demand Response mechanisms using Blockchain technology, with the aim of verifying if it is possible to implement this approach to its business activities.
Approach to exploitation	Emotion will use the involvement in the eDREAM project to improve its employees skills on DR programs also as part of the participation to other European projects in which it participates, such as WiseGRID (http://www.wisegrid.eu/), SOFIE (http://www.sofie-iot.eu/), NRG-5 (http://www.nrg5.eu/). In addition, the acquired knowledge will be exploited to increase its business, offering to the market products and services enhanced during the project, with the aim of giving strength to electric mobility, for a cleaner mobility, allowing an increasingly massive deployment of electric vehicles and charging stations and an increasingly intense use of renewable photovoltaic energy that is mainly produced at lunchtime, when consumption is lower and when the vehicle could be parked in charge.

Table 17: EMOT individual exploitation plan

4 Project Assets

The eDREAM project assets consist of the three modules concurring to create the overall project value proposition and the list of software components, tools, technologies and methodologies being developed on purpose to reach the project objectives.

Table 18 reports the preliminary list of project assets, the identified ownership for each component and the list of partners interested by joint exploitation activities.

Component	Owner	Joint Ownership
eDREAM value proposition		
Local flexibility marketplaces	eDREAM Consortium	ALL
Local peer-to-peer energy marketplaces	eDREAM Consortium	ALL
VPP optimization framework through dynamic coalitions	eDREAM Consortium	ALL
New components developed for eDREAM		
Electricity Consumption/Production Forecasting	TUC	CERTH
PV/RES Degradation & Trend Analysis	TU	CERTH
Virtual Power Plants Generation Modelling & Forecasting	TUC	
Multi-building DR characterization through thermal, optical and LIDAR information fusion	TU	CERTH
Baseline Flexibility Estimation	TU	E@W
Load Profiling	ATOS	
Big Data Clustering at Multiple Scales	ATOS	
Customer Segmentation	ATOS	
VPP and Active Microgrid Flexibility Profiling	TU	
VPP and DR Services Optimization Engine (back-end)	TU	CERTH
Closed-loop DR Verification Engine	ENG	E@W
Secure data handling through ledger	ENG	E@W
Blockchain-driven control for LV networks (flexibility management)	TUC	
Secured Blockchain-driven Energy Market	TUC	
Local/Remote HMI	CERTH	
DR Aerial Survey Toolkit	TU	CERTH
DSS & DR Strategies Optimization (front-end)	TU	CERTH
Forecasting Tool	TUC	CERTH
Graph-based Analytics	CERTH	

Table 18: eDREAM's assets, ownership and expression of interests for joint ownerships

The valorisation strategy for the project assets will cover the two different layers: each partner will participate to the exploitation of the assets defining the project value proposition and will leverage on the single new components developed, or group of these, following ad-hoc exploitation activities, individually or in conjunction with the relevant project partners.

The list will be refined through the advancement of the project and will be included in D8.8 together with the IPR protection plan and the potentially related patents to be applied.

5 Conclusions

This report presents the initial exploitation strategy and the identified project assets for the eDREAM project.

The context identification together with the initial SWOT analysis provided to the partnership the initial scenario for the possible exploitation of projects results. Accordingly the partners improved their exploitation plans, either as joint initiative and as individual capitalization of the results expected as project output. Value proposition definition was one of the main steps of this process giving to each partner the opportunity to refine its exploitation plan and reinforce the relation with the overall partner business activity, such as extending company business offer portfolio.

The implementation of the eDREAM exploitation strategy, which updates and integrates the initial plan presented in D8.1 *“Plans for the dissemination, exploitation & communication of project results”* will be monitored and reported in D8.8 *“Exploitation Report and IPR Protection Plan V2”* and integrated as the project platform development progress.

6 References

-
- 1 https://ec.europa.eu/energy/sites/ener/files/quarterly_report_on_european_electricity_markets_q4_2018_0.pdf
 - 2 <https://www.arera.it/it/dati/ees5.htm>
 - 3 <https://luce-gas.it/guida/mercato/andamento-prezzo/energia-elettrica#2019>
 - 4 <http://download.terna.it/terna/0000/1191/20.PDF>
 - 5 https://ec.europa.eu/clima/policies/strategies/2020_en
 - 6 https://ec.europa.eu/commission/publications/third-report-state-energy-union_en
 - 7 https://ec.europa.eu/energy/sites/ener/files/publication/iem_web_0.pdf