Innovation Action

inteGRIDy

integrated Smart GRID Cross-Functional Solutions for Optimized Synergetic Energy Distribution, Utilization & Storage Technologies

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Executive Summary

The inteGRIDy project is funded through the European Union's Horizon 2020 scheme and aims to facilitate the optimal and dynamic operation of the distribution grid.

Through the deployment of a range of technologies, systems and frameworks inteGRIDy will help to support the EU's decarbonisation, renewables deployment and energy efficiency objectives. It also supports the creation and commercialisation of new innovations at an early TRL level, therefore accelerating Europe's transition towards a low carbon economy.

This report forms Deliverable 9.7 and sits within Work Package 9, which aims to establish and implement well-focused dissemination, exploitation & communication. Within this package we will:

- Coordinate dissemination and stakeholder engagement activities at local, national and EU level, attending to conferences, workshops, and energy events related to the topic;
- Extend the awareness and impact of the project through the website and social media presence;
- Define the Exploitation Strategy and business goals of commercial exploitation among the partners and the whole consortium

This report presents the exploitation activities for the inteGRIDy project. It is composed of contextual analysis alongside details from each of the partner organisations, including:

- Commercialisation route
- Target users/customers
- Value proposition and key benefits
- Potential impact on market
- Strategy for the exploitable contents
- Plan to achieve exploitation approach
- Business model to drive exploitation approach
- Pilot level exploitation approach

This is complemented with information gained during the previous planning activity compiled as part of Deliverable 9.1 and Deliverable 9.6.

Successful exploitation will ensure that the research results are implemented and have an impact on the market, on future developments and on policymaking. Exploitation activities include identifying the main exploitable assets of the project, a market analysis, an investigation of business models to exploit project results and the development of a project business plan for individual partners and at pilot level. Exploitation objectives of the project will be used to help guide targeted dissemination activities and any future replication plan.

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List of Acronyms and Abbreviations

Term	Description
API	Application Programming Interface
DR	Demand Response
DSO	Distribution System Operator
EASE	European Association for Storage Energy
ESCO	Energy Services Company
EV	Electric Vehicle
HVAC	Heating, ventilation and air conditioning
IoT	Internet of Thing
IPR	Intellectual Property Rights
LNG	Liquid Natural Gas

MoU	Memorandum of Understanding
RI	Regional Initiatives
TYNDP	EU-wide ten-year network development plans
VLL	Value of Lost Load

1.Introduction

1.1 Scope and objectives of the deliverable

This updated Exploitation Strategy and IPR Protection Plan set down a clear approach for how the inteGRIDy consortium will ensure the project innovations are commercialised and protected.

The objective of this document is to present the overall plan for the exploitation of the results of inteGRIDy project. It brings together the update individual and new pilot exploitation reports that consortium partners have contributed, as well as contextual analysis to ensure we understand the wider market and regulatory landscape the project innovations sit within.

In line with the Grant Agreement of the project, this document will be followed by final iteration (D9.8) of the Exploitation Strategy and IPR Protection Plan that will describe the concrete final exploitation activities by the project consortium in M48.

The inteGRIDy project integrates cutting-edge technologies, solutions and mechanisms in a scalable cross-functional platform of replicable solutions. Through enhanced visibility of generation and consumption profiles, this platform connects existing energy networks to diverse stakeholders.

The project aims to facilitate the optimal and dynamic operation of the distribution grid. It also fosters the stability of the electricity grid and coordination of distributed energy resources, virtual power plants and innovative collaborative storage schemes within an energy system with an increasing share of renewable energy.

Project's innovations are built upon:

- Integration of existing smart-metering/automation systems, together with intelligent internet of things (IoT) infrastructure, enabling interoperability through a standardized application programming interface (API)s and efficient data collection and monitoring of grid's distributed assets.
- Novel modelling and profiling mechanisms allowing the creation of network topology and demand response models, together with battery cycling and charging profiles.
- Predictive algorithms enabling dynamic scenario-based simulation and multi-level forecasting engine for satisfying conflicting demand and supply of energy in real-time
- Powerful and efficient visual analytics and end-user applications based on the use of novel human-machine interaction techniques.
- A security access control framework, for privacy and data protection.
- Innovative business models for the energy market aiming to dynamically involve demand-response strategies and allowing new entrants to the market to participate in the distribution grid's operations.

The inteGRIDy project plans to implement and demonstrate a solution covering the above innovations under a variety of environmental, market and societal conditions at ten pilot sites across the EU.

1.2 Structure of the deliverable

Under the Horizon 2020 programme, beneficiaries should engage in dissemination and exploitation activities to ensure the project delivers maximum value for money. As Horizon 2020 is financed by EU citizens, it is important that it shares the acquired knowledge with the largest number of people and that the fruits of the research benefits society as a whole.

Under the EU's definition, dissemination means sharing research results with potential users - peers in the research field, industry, other commercial players and policymakers). By sharing your research results with the rest of the scientific community, you are contributing to the progress of science in general.

Exploitation, on the other hand, is defined as 'the use of results for commercial purposes or in public policymaking'. Under the terms of the grant agreement, each beneficiary must take measures aiming to ensure 'exploitation' of its results (either directly or indirectly), by (a) using them in further research activities (outside the action); (b) developing, creating or marketing a product or process; (c) creating and providing a service, or (d) using them in standardisation activities.

The approach taken on inteGRIDy has been to conduct extensive research to understand what constitutes best practice with respect to exploitation planning. We have utilised information from a number of sources including the European Commission's IPR Helpdesk and other Horizon 2020 funded projects such as Atena (Project 700581), Future Sky Safety (Project 640597) and OpenGovIntelligenc (Project 693849.) This information has enabled us to define a scope of work for the strategy as well as validate our assumptions about content, level of detail and length of the document.

Following this, we have taken the approach of co-developing the exploitation strategy with our project partners. We have used a template to ensure information received from partners is consistent and provides the detail we require to compile the strategy.

Finally, we have defined a thorough review process for this strategy which we believe will enhance the quality of our work and ensure the final version is in line with industry best practice.

1.3 Relation to Other Tasks and Deliverables

The nature of this exploitation strategy and the fact it is a key responsibility for all project partners means it is ultimately relevant to all work packages within inteGRIDy. However, Work Package 3 is at this stage the most relevant as it contains the analysis of Energy Market & available Business Models, as well as the development of new business models & the inteGRIDy replication plan also. As the project moves forward, we believe that Work Package 8 will also be critical, in particular, the elements relating to Business Models Assessment and Replication Feasibility Analysis. Finally, there are a number of parallel tasks within Work Package 9 that are relevant, in particular, Task 9.4, 'Policy Recommendations & Best Practices for Internal Electricity & Retail Market'.

It is also important to note that the content of this report also relies on the preliminary exploitation plans drafted during the elaboration of D9.1 deliverable on Dissemination and Exploitation plans and D9.6deliverable on Exploitation Report and IPR Protection Plan.

1.4 Summary of Changes

This section highlights the update(s) made to the last version of this deliverable D9.6 Exploitation Report and IPR Protection Plan.

- Updated sub-sections 1.1 and 1.3 respectively;
- Included sub-section 1.4 (summary of changes);
- Included the pilot level project innovation table;
- Updated sub-section 3.1 (Market Analysis);
- Added sub-section 3.6 (Business model);
- Updated Exploitation Strategy section to include pilot exploitation;
- Updated sub-section 5.2 (Route to protect inteGRIDy IP);
- Updated Annex I to include partners information on (exploitation strategy, plan and actions); and
- Added Annex II Pilot Site Exploitation plan.

2. Exploitation Assessment

2.1 Identification of exploitable results

A key element of this strategy will be to identify exploitable content by individual partners and pilots. Within this chapter, we have collated all of the innovations generated during the project and detail their key characteristics. The various innovations will then be described in detail in the sections below.

We begin this chapter with a set of definitions for the categories which the various pilot project and partners innovations sit within. The definitions have been compiled from multiple sources including the Oxford English Dictionary, Wikipedia, the European Union's IPR helpdesk and Collin's English Dictionary.

2.2 Definitions

2.2.1 Guidelines

A guideline aims to streamline particular processes according to a set routine or sound practice. By definition, following a guideline is never mandatory. Guidelines are not binding and are not enforced. In the context of inteGRIDy a guideline may relate to a set of processes or industry standards that should be followed in order to make the actions of other projects more successful and high quality, based on our experience of from our 10 pilot projects. For instance, we may identify and propose guidelines for how to successfully deploy smart grid technology or utilise battery storage.

2.2.2 Methodology

A methodology is the set of approaches applied to a particular area of research or work. It comprises the theoretical analysis of the methods, principles and processes used to get from A to B. It does not set out to provide solutions, instead a methodology offers the theoretical underpinning for understanding which method or set of processes can be applied to a specific case, for example, to calculate a specific result.

2.2.3 Framework

A framework is a broad overview, outline, or skeleton of interlinked items which supports a particular approach to a specific objective and serves as a guide that can be modified as required by adding or deleting items.

2.2.4 Products

A product is anything that can be offered to a market that might satisfy a want or need. A product can be classified as tangible or intangible. A tangible product is a physical object that can be perceived by touches such as a building, vehicle, gadget, or clothing. An intangible product is a product that can only be perceived indirectly such as an insurance policy.

2.2.5 Services

A service is a transaction in which no physical goods are transferred from the seller to the buyer. The benefits of such a service are held to be demonstrated by the buyer's willingness to make the exchange. Services are often described in terms of the Three I's – Intangible, Inconsistency and Involvement.

Intangible: Services are by definition intangible. They are not manufactured, transported or stocked. Services cannot be stored for future use. They are produced and consumed simultaneously.

Inconsistency: Each service is unique. It can never be exactly repeated as the time, location, circumstances, conditions, current configurations and/or assigned resources are different for the next delivery, even if the same service consumer requests the same service. Many services

are regarded as heterogeneous and are typically modified for each service consumer or each service contextual. Involvement: Both service provider and service consumer participate in the service providers.

2.2.6 Prototypes

A prototype is an early sample, model, or release of a product built to test a concept or process or to act as a thing to be replicated or learned from. It is a term used in a variety of contexts, including design, electronics, as well as software programming. A prototype is generally used to evaluate a new design to enhance precision by system analysts and users. Prototyping serves to provide specifications for a real, working system rather than a theoretical one.

2.2.7 Software

Computer software is a generic term that refers to a collection of data or computer instructions that tell the computer how to work, in contrast to the physical hardware from which the system is built, that performs the work. Computer software includes computer programs, libraries and related non-executable data, such as online documentation or digital media.

2.2.8 System architecture

A system architecture or systems architecture is the conceptual model that defines the structure, behaviour, and more views of a system. An architecture description is a formal description and representation of a system, organized in a way that supports reasoning about the structures and behaviours of the system.

A system architecture can comprise system components, the expand systems developed, that will work together to implement the overall system.

2.3 Project innovations

This tables below provides an overview of which category the partner's project innovations and pilot project innovation (further explained in Annex I and Annex II) developed on inteGRIDy sit within. The top row details the category and the first column highlights the project partner and pilot.

As the tables below shows most partners are developing innovations that can be commercialized as a service; while majority of the pilots are developing innovations that can be commercialized as a Software. In addition, many partners and pilots are also developing products, prototypes and software also.

Table 1. Partner's Project innovations.

	Methodology	Framework	Products	Services	Prototypes	Software	System architecture
	Large Industrial Companies						
ATOS			X	X		X	
Siemens				X	X	X	
Engineering Ingegneria Informatica						X	

Siveco			X	X		X	
	DSO/Utilities/Energy providers						
Gas Natural SDG S.A.				X			
INNED				X			
WVT			X	X	X		
ASM Terni				X			
PH Energia			X	X		X	
EAC				X			
ELECTRICA							
A.S.SE.M. S.p.A.				X			
	Small and Medium Enterprises						
VPS			X	X		X	
MINUS 7			X	X			
Une				X			
Trek Consulting			X	X		X	
SYSTEMS SUNLIGHT S. A			X	X			
Aiguasol			X	X	X		
	Research and academic partners						
CERTH			X	X	X	X	
UNIROMA				X		X	
Politecnico di Milano				X	X	X	
University of Cyprus				X			
Universidade Católica Portuguesa				X		X	
Teesside University			X	X	X	X	
University of Newcastle						X	

	Non-Profit organizations						
Energy@Work			X		X	X	
LISBOA E-NOVA			X	X	X	X	
	Public bodies						
Isle of Wight Council							

Table 2. Pilots Project innovations.

	Methodology	Framework	Products	Services	Prototypes	Software
Pilot 1 – Isle of Wight (UK)			X	X		X
Pilot 2 – Terni (IT)						
Pilot 3 – S. Severino Marche (IT)				X	X	X
Pilot 4 – Barcelona (ES)						
Pilot 5 – St Jean Maurienne (FR)						
Pilot 6 – Nicosia (CY)				X		
Pilot 7 – Lisbon (PT)			X			X
Pilot 8 – Xanthi (GR)			X			X
Pilot 9 – Ploiesti (RO)			X	X		X
Pilot 10 – Thessaloniki (GR)				X	X	X

3.Market analysis

The successful exploitation of the innovations that are generated through inteGRIDy will be dependent on how they are disseminated, positioned within their market environment and regulatory framework and support with the right business model. In this chapter, we aim to summarise the European smart grid market at a high level to provide guidance and information to the reader. A more detailed review of the markets, regulatory frameworks and business models is completed in Work Packages 3, 4 and 9 of the projects.

3.1 Market description

The European Smart Grid Task Force defines Smart Grids as electricity networks that can efficiently integrate the behaviour and actions of all users connected to it — generators, consumers and those that do both — in order to ensure an economically efficient, sustainable power system with low losses and high quality and security of supply and safety.[SMT13]

The traditional model for the transmission and distribution of electricity assumed that power would be generated in large, central coal, gas or nuclear power stations and flow towards end-users via substations that converted voltage down to appropriate levels. However, today a much higher proportion of generating plants are small-scale and, since many of these assets are renewable, their output is harder to control. Power flows in two directions and is much harder to forecast, presenting a number of opportunities and challenges to system operators.

Smart grids are a way of contending with these issues as they can automatically monitor energy flows and adjust to changes in energy supply and demand accordingly. When coupled with smart metering systems, smart grids can benefit consumers and suppliers by providing information on real-time consumption. Smart grids can also help to better integrate renewable energy; renewable sources of energy such as wind and solar are in a constant state of flux and this can cause serious imbalances on the electrical grid, but by combining information on energy demand with weather forecasts, smart grid operators to better plan the integration of renewable energy into the grid and balance their networks. Smart grids also open up the possibility for consumers who produce their own energy to respond to prices and sell the excess to the grid.

With growing electricity consumption, the peak electricity demand is expected to increase manifold by 2050. It is believed that owing to their intelligence features, smart grids have the potential to reduce the projected peak demand increases by up to 24% across some of the major regions of the world. This is because sensors in smart grids can detect peak load in advance and divert surplus supply from low demand areas to meet the peak requirements in a particular region. Moreover, with countries having ambitious renewable energy targets, it is important to ensure that a compatible infrastructure is put in place in parallel.

A key driver for the rise of smart grids is the EU's decarbonisation, renewables deployment and energy efficiency objectives; as well as the emergence of new technologies like smart meters. The smart grid market in Europe is growing rapidly. A recent report by the Joint Research Centre (JRC) included 950 smart grid projects (R&D and demonstration) across Europe; across these, a total of EUR 5 billion has been invested. European smart grid market revenue is expected to grow at a CAGR of 8.6% from 2015 to 20252.

Beyond Europe, several nations across the world have already recognized the need for upgrading to smart grids and have developed programmes to encourage this transition. The United States, for example, has allocated $4.5 billion towards grid modernization, and this investment will increase over the years under the American Recovery Reinvestment Act of 20093.

No single product or solution turns a legacy grid into a smart grid. The market includes a wide range of products and smart grid projects are characterised by their high complexity and often

rely on leveraging the many interdependencies between different technology classes. Within inteGRIDy we are focused on four key themes:

a) Demand response
b) Smartening the distribution grid
c) Energy storage technologies
d) Smart grid transportation integration

These four areas are all experiencing significant growth currently, demonstrating that there is a significant potential for inteGRIDy innovations to be commercialised. Demand response provides an opportunity for consumers to play a significant role in the operation of the electric grid by reducing or shifting their electricity usage during peak periods in response to time-based rates or other forms of financial incentives. It is currently the fastest growing segment within the European smart grid market with a 10-year growth rate of 17.6%4.

Smartening the distribution grid, which includes distribution automation and other aspects of distribution grid management, has strong growth opportunities also with revenue growing at a CAGR of 8.2% from 2015 to 2025. Europe is the biggest distribution automation market globally and is expected to maintain its leadership position even in 2055.

Energy storage technologies are a key component in providing flexibility and supporting renewable energy integration in the energy system. Storage deployment is growing rapidly in Europe and across the world. In 2015 there was just 300MWh of battery storage capacity installed, but just two years later in 2017 that had reached over 1GWh(6).

Transportation accounts for a third of the world's energy consumption and 72% of oil demand but we are currently witnessing a shift towards ultra-low emission vehicles such as EVs. Even low levels of EV adoption will have a significant impact on utilities and the grid—a single EV plugged into a fast charger can double a home's peak electricity demand. Consequently, it is crucial for utilities to manage EV charging. A smart grid is the key to "smart" EV charging, providing the visibility and control needed to protect components of the distribution network, such as transformers, from being overloaded by EVs and ensure electricity generating capacity is used most efficiently(7).

3.2 PESTLE Analysis

As part of Work Package 1, the inteGRIDy partners conducted extensive PESTLE (Political, Economic, Social, Technological, Legal and Environmental) analysis on the smart grid market particularly relating to the four theme areas highlighted above. PESTLE analysis is a strategic framework used to analyse various external factors that influence and/or impact on various market structures.

This PESTLE analysis revealed that the political, environmental and social structures within Europe are favourably positioned to support the inteGRIDy activities and outputs. However, the legal, technological and economic factors could present obstacles for the project.

Political: The countries in which pilots are taking place were found to be politically supportive since strategies and lobbying activities increase awareness amongst key stakeholder groups and numerous legal initiatives are in place to support innovation.

Environmental: From an environmental perspective, things also look positive - there exist a wide plethora of national and international initiatives that look to minimise environmental impact reduction, and these are closely aligned to the ultimate objectives of the project.

Social: European society was found to be supportive of projects like inteGRIDy (and the concepts that underlie them), providing they are kept informed about the proposed innovations and are able to voice their opinion about how the pilot projects are rolled out.

On the other hand, considering the specific issues in the PESTLE the major obstacles come from a legal, economic and technological perspective.

Legal: Legally, the fulfilment of new EU Directives can be challenging as the existing market mechanism regulations and the vested interests of the status quo can inhibit change.

Economic: The economic factor may be a barrier considering the prioritization of investment and budget allocation. inteGRIDy, having the focus on the distribution grid, should aim at providing innovative solutions oriented to DSOs and Utilities, helping them engaging customers and enabling the use of models from which both parties could benefit.

Technologies: Implementation of cutting-edge technologies comes together with a need for competences. Infrastructure and human resource costs are very high and weigh a lot in the decision of implementing large-scale solutions, like inteGRIDy. The process of collecting and processing of data (i.e. data mining) are also very expensive.

The full description of the PESTLE analysis of smart grids conducted for the inteGRIDy project can be found in Work Package 1: Task 1.1 'Definition of Obstacles & Barriers related to inteGRIDy's Innovation'.

3.3 Main users

The table below provides a summary of the main users for the various inteGRIDy innovations. More details can be found in Annex I 'Individual Exploitation Plans'.

	DSO// System operator	Energy supplier	Building operators	Residential consumers	I&C consumers	Energy services co.	Other
	Large Industrial Companies						
EAATOS	X						
Siemens			X	X			
Engineering Ingegneria Informatica							X
Siveco	X	X		X	X		
	DSO/Utilities/Energy providers						
Gas Natural SDG S.A.			X	X	X		
INNED			X	X			
WVT				X		X	X
ASM Terni				X			X
PH Energia					X		
EAC							X

ELECTRICA	X	X				X	
A.S.SE.M. S.p.A.	X						
	Small and Medium Enterprises						
VPS		X			X		
MINUS 7			X				X
Une				X	X		
Trek Consulting	X			X	X	X	X
SYSTEMS SUNLIGHT S. A							X
Aiguasol	X		X				X
	Research and academic partners						
CERTH	X	X					X
UNIROMA	X						X
Politecnico di Milano	X	X					
University of Cyprus	X						X
Universidade Católica Portuguesa							X
Teesside University			X			X	X
University of Newcastle							X
	Non-Profit organizations						
Energy@Work	X		X			X	
LISBOA E-NOVA					X		
	Public bodies						
Isle of Wight Council							X

3.4 Regulatory environment

There is a highly complex regulatory environment within Europe relating to smart grids. Legislation, policy and regulation exist at a local, national as well as a continental level and this presents a challenging landscape for organisations like the inteGRIDy partners who look to bring innovation to the market.

This section aims to provide a very high-level overview of some of the key regulatory considerations that apply at an EU level. More detailed analysis is conducted within Work Package 1: Deliverable 1.3 and also Work Package 9: T9.4 'Policy Recommendations & Best Practices for Internal Electricity & Retail Market'. This task looks to identify how the different structures of the utilities industry and property markets in different EU states impact on business models developed for the demonstration use cases.

The 'Clean energy for all Europeans' package that the European Commission released in 2016 included proposal for a regulatory framework aimed at defining a structure for such advancement in the entire EU in the years to come. The complex goals and policy drivers can only be realised through the deployment of a diverse range of smart grid technologies and projects.

So far, four out of the eight legislative proposals in the package have been agreed by the co-legislators, with the most recent being the Energy Efficiency Directive, Renewable Energy Directive and the Energy Performance in Buildings Directive. These pieces of legislation complement the revision of the Emissions Trading System, the Effort Sharing Regulation and the Land Use Change and Forestry Regulation that were also adopted in 20188.

The Commission has also said through various communiqués that Smart Grid deployment should first and foremost be market driven. Investors and the main beneficiaries of smart grids will respond to natural drivers such as the possibility to enhance network efficiency, improve system operation and reduce costs. The Commission has suggested that a precondition for the smart grid transition is that solutions such as smart metering infrastructure remain open, business-model neutral and inclusive, and also allow SMEs to participate fully. Smart grids, above all, must be focused on providing added-value services to customers.

There is wide agreement among the investment community that the regulatory framework needs to be conducive to investment in Smart Grids. The Electricity Directive and the Energy Services Directive provide a mix of obligations and incentives to the Member States to establish such a framework. Regulatory incentives should encourage a network operator to earn revenue in ways that are not linked to additional sales, but are rather based on efficiency gains and lower peak investment needs, i.e. moving from a 'volume-based' business model to a quality- and efficiency-based model9.

The European Commission is actively monitoring Member States' progress, and providing guidelines on key performance indicators. If insufficient progress is made within the acceptable time frame, the Commission will consider introducing stricter regulation for the implementation of Smart Grids10.

National incentive regimes must ensure that they do not diverge to an extent where trade and cooperation across national borders become difficult. The Commission has stated that smart grid deployment in the Member States should also proceed at a similar pace. Large differences between national energy infrastructures would prevent businesses and consumers from reaping the full benefits of Smart Grids. Permitting procedures for the construction and renewal of energy grids have to be streamlined and optimised, and regional regulatory barriers and resistances must be tackled. In this context, the EU-wide ten-year network development plans (TYNDP), as well as the Regional Initiatives (RI), can play a major role11.

3.5 Positioning of inteGRIDy innovations

Information regarding the offering, value proposition, customer benefits and potential impact on the market is contained within Section 4.2.2 'Individual Exploitation Plans'. In summary, the partners have a diverse offering in the market ranging from innovative technologies like those developed by Minus7 to new energy-related services such as those offered by GNF. The InteGRIDy partners have shown they have a unique value proposition and offer benefits that are much needed by the market. VPS, for instance, can provide energy retailers and

aggregators with the ability to deliver newly added value services like Energy Efficiency, Resource Management and others. Services like this can enable utilities to balance the grid more effectively through demand response programmes which in turn means the grid can integrate more renewable generation, therefore contributing to Europe's efforts to decarbonise and grow the low carbon economy.

3.6 Business Model and Market Impact

Deliverable 3.2 and Deliverable 3.3 analysed the viability of the inteGRIDy solutions/services and the dynamic mechanics by which the project partners/IP owners could make financial gains off the inteGRIDy solutions/services respectively. These assessments are vital to the exploitation strategy of the inteGRIDy results because it provides a clear Go-To-Market guide for all the exploitable result for each individual partner and/or pilot. This analysis is followed by an economic condition analysis of key factors such as maturity level of competition, arrangements in the Smart Grid-like market and incentives and support mechanisms provided by the state or market (see details in table below).

Table 3. Economic conditions: Key factors analysed

Addressed factors	Details
Existence and maturity level of competition in the market	The following market archetypes that are of a particular interest for the inteGRIDy project are considered: virtual power plant (VPP), aggregation, direct response, metering and consumption reading, renewable energy retailers, electrical/thermal storage.
Economic arrangements in the Smart Grid-like market	E.g. government capex grants or finance schemes, export incentives or feed in tarrifs present in the market.
Economic incentives and support mechanisms provided by the state or market	E.g. incentives for aggregators, active users, utilities.

The varying response from partners on the suitability of the business model been developed with them by UCP indicates that there are commonalities and uniqueness between some of the pilots and the possibility of a joint-exploitation approach is feasible. The business model type that could be adopted for each pilot implementation would be one of the following as listed in D3.3.

- Customer-owned product centred BM: the system is purchased by the final user, who finances or operates the infrastructure.
- Third party energy service centred BM: providing a service rather than a product.
- Energy Community BM: control over the energy origin is done by members of the Energy Community or external parties (utilities or no-profit).

Note:

Due to the solution implementation stage and on-going business model design activities for the exploitation of project results/exploitable contents, partners are unable to provide a specific time-bound information on their exploitation plan.

All exploitation (i.e. commercialisation) plan will be driven by a business model been developed by the project, this will take into account any changes to regulatory framework and market structure within the project partner's country and/or EU region.

4. Exploitation strategy for inteGRIDy

In this section, we provide an overview of the options available to inteGRIDy partners for how they commercialise and exploit the various innovations they create on an individual level and on a pilot level. In the opening chapter, we will identify the salient options for commercialisation. **Annex I** contain the measures, strategies and results that will be implemented to utilise the advances made on this project from a project and partner perspective. **Annex II** contains the value proposition, strategies and results that will be implemented to drive the advances made on this project from a pilot perspective.

4.1 Potential commercialisation options

4.1.1 Assignment

An IP assignment is a transfer of ownership of an IPR, such as a patent, trademark or design, from one party (the assignor) to another party (the assignee). Consequently, the assignee becomes the new owner of the IPR.

Assignments are useful tools for commercialisation, when the owner of the IP does not have enough capabilities (financial, HR, marketing, etc.) to market the developed intellectual asset and/or when the owner would like to realise an immediate cash flow from an IP asset, which he does not plan to exploit with its own resources.

4.1.2 Licensing

A licence is a contract under which the holder of the intellectual property (licensor) grants permission for the use of its intellectual property to another person (licensee), within the limits set by the provisions of the contract. Hence, in business language, a licence allows the licensor to make money from its intellectual asset by charging the licensee in return for its use. Licensing has a vital role in companies' commercialisation strategies, since there are significant advantages of licensing IP, creating a win-win situation for both parties.

Franchising is a special type of licensing, enabling the replication of an owner's (franchisor) established business concept in another location by providing continuous support and training to the recipient (franchisee). Typically, in a franchise, an owner (franchisor) retains control of the brand and licenses (that is, grants permissions to) the franchise to use its successful business model and brand. In exchange, the franchisee puts up the initial capital for the business, helps to promote the brand and pays a licence fee. The franchisor supports its franchisees by providing training, know-how, marketing and other resources and skills. Since business concepts include the use of IP allowing the business to be run, franchising has an intrinsic connection with IP based on licensing of IPRs and know-how. In Europe, the regulation of franchising is not harmonised. Also, in most EU Member States there are no independent codes establishing all the rules for this particular partnership. However, the European Code of Ethics for Franchising establishes a set of voluntary guidelines and principles for both franchisors and franchisees.

4.1.3 Joint venture

JVs are business alliances of two or more independent organisations (venturers) to undertake a specific project or achieve a certain goal by sharing risks. IP has an important role in the creation of such collaborations since venturers bring their own intellectual assets for the success of a JV and they should agree on their initial contributions, responsibilities and obligations within the alliance as set out in JV agreements.

4.1.4 Spin-off

Spin-offs (or spin-outs) are separate legal entities created by a parent organisation (PO) to bring its IP assets into the market. It is generally an efficient solution for the parent organisations, who may not be fully capable of commercialisation of their own IP assets, such

as for universities and research institutions. Spin-offs are seen as an important means of technology transfer since they are acting as an intermediary between the research environment and industries while putting research results into the commercial market with a marketable product. Moreover, through spin-offs, research organisations can focus on their main task of “research” instead of “marketing”, which is the main task of commercial companies (spin-off).

4.1.5 Consultancy

Consultancy is one of the most widespread activities in which industry and academics engage. This channel is very important to the industry and usually does not compromise the university’s objectives. There are generally two variations on consultancy that can be explored. Contract Research is research, based on the new technology/product commissioned by a private company to pursue a solution to a problem of interest. The results generated should be owned by the private-sector party. Faculty consulting, on the other hand, encompasses research or advisory services provided by researchers to industry clients on specific topics, and often any background or foreground IP is maintained by the researcher.

5.IPR Protection Strategy

5.1 IPR Assessment

The IPR assessment for each project partner has been included in Annex I tables. This table summarises the IP generated by each partner. The information and definitions presented within this section are based on guidance from the European Union's IPR Helpdesk, which provides support on IP matters to beneficiaries of EU funded research projects and EU SMEs.

5.2 Routes to protect inteGRIDy IP

There are a number of routes available to inteGRIDy partners to protect the Intellectual Property they have generated on the project. The four most relevant to inteGRIDy are trademark, patent, industrial design and copyright.

Trade Mark:

A trademark is an exclusive right over the use of a sign in relation to the goods and services for which it is registered. Trademarks consist of signs capable of distinguishing the products (either goods or services) of a trader from those of others. Such signs include words, personal names, logos, letters, numbers, colours, shapes/packaging, sounds.

The main function of a trademark is to identify the commercial origin of a product. Trademarks also convey a message about the quality of a product, therefore facilitating consumers' choice. Furthermore, they are used for advertisement purposes and can function as an investment instrument (e.g. they can be assigned, licensed, etc.).

Trademark registration can be performed at three different levels - national, regional and international. The best route usually depends on the applicant's target markets, business and financial capabilities, as well as commercial expectations.

The exclusive right conferred by a trademark allows its owner to prevent others from using the same or similar signs for identical or related goods and/or services as those protected by the trademark in the course of trade, without the owner's prior permission.

Patent:

A patent is an exclusive right granted for the protection of inventions (products or processes) offering a new technical solution or facilitating a new way of doing something. The patent holder enjoys the exclusive right to prevent third parties from commercially exploiting their invention for a limited period of time. In return, the patent holder must disclose the invention to the public in the patent application.

Patent registration can be performed at three different levels: national, regional and international (through the Patent Cooperation Treaty (PCT) System). The best route usually depends on the territories where a company intends to exploit the patent. A European patent can be obtained for all the European Patent Convention (EPC) contracting states by filing a single application, under a single set of fees with the European Patent Office (EPO).

The exclusive right conferred by a patent allows its owner to prevent others from making, using, offering for sale, selling or importing a product or a process based on the patented invention, without the owner's prior permission.

Industrial Design:

An industrial design is the outward appearance of a product resulting from the features of, in particular, the lines, contours, colours, shape, texture and/or materials of the product itself and/or its ornamentation.

Designs can be protected by different means: through a registration system, through a system of non-registration and through copyright. Registration can be obtained at three different levels:

national, regional and international. The best route usually depends on the markets in which the applicant intends to operate.

Industrial Design protection generally prevents other organisations from using the registered design and prevents third parties from using it commercially without prior consent.

Copyright:

Copyright (or author's right) is the term used to describe the rights that creators have over their literary, scientific and artistic works. There is not an exhaustive list containing the works that can be protected by copyright. However, there is a number of works usually covered by copyright at international level (the examples most relevant to inteGRIDy are highlighted in bold):

- literary works such as novels, poems, plays, newspaper articles;
- computer programs, databases;
- films, musical compositions, and choreographies;
- artistic works such as paintings, drawings, photographs,
- and sculptures;
- architecture; and
- advertisements, maps, and technical drawings.

In the EU, copyright protection is obtained automatically from the moment when the work is created, and no registration or other formality is required. However, some countries allow for the voluntary registration/deposit of works protected by copyright. Therefore, registration is not constitutive of the right but can be useful in some situations (e.g. to solve disputes over ownership or creation, to facilitate financial transactions).

Approach taken by InteGRIDy partners:

As part of this document InteGRIDy partners have assessed whether they are generating any new intellectual property as part of this project. No decisions have yet been taken on which route is most appropriate to protect this IP, however, inteGRIDy partners are exploring various opinion including signing Memorandum of Understanding (MoU) as a means of protecting any IP coming out of the project. Over the coming remaining months of the project, the project's Exploitation Manager will work with each of the partners to help select the optimal route for protecting foreground IP.

6. Conclusions and recommendations

6.1 Conclusions

This document builds on the planning that was presented in D9.1 and D9.6; and goes further to provide additional detail on how the inteGRIDy partners have approached commercialisation and IPR protection on an individual level and at the pilot level. This updated Exploitation Strategy and IPR Protection Plan provides a clearer strategy and guideline for how the inteGRIDy consortium will ensure the project innovations are well exploited, commercialised and protected.

The document builds on the D9.6 finding that shows there is a range of exploitable innovations set to be delivered through the inteGRIDy project. It also shown that both the individual partners and pilots have made significant progress in defining measures to ensure that these innovations are commercialised, either by forming joint ventures or spin-offs where there is a business case to do so or exploring other ideas to joint exploitation. The exploitation reports that consortium partners have contributed show that the project is primed to generate new sets of intellectual property that will need to be protected. This report has identified a range of potential measures to protect IP and in the final iterations of the Exploitation Strategy, we will look to detail many of these to ensure appropriate safeguards are in place to protect this property.

Through contextual analysis of the wider market and regulatory landscape, the report has demonstrated that the InteGRIDy project is very well positioned to respond to the many challenges faced by the European energy system. Innovation in the four areas that InteGRIDy focuses on (demand response, smartening the distribution grid, energy storage technologies and smart grid transportation integration) would make a direct contribution towards the priorities set by the EU such as decarbonisation and clean growth.

In line with the Grant Agreement of the project, this document will be followed by subsequent iterations of the Exploitation Strategy and IPR Protection Plan that will describe the concrete exploitation activities made by the consortium.

6.2 Recommendations

The updated recommendation of this report is that commercialisation, exploitation and IPR protection for the inteGRIDy innovations both at the pilot and individual partner level must remain a critical focus of the project to ensure the successful completion of the project. This report has shown that several new innovations and intellectual property will be developed as a result of inteGRIDy which we must ensure that they are well protected and commercialized in an effective manner.

This is because of the fact, that the project has gradually progressed into a more matured stage and many partners/pilots are making significant progress to complete their work packages, leading to a further recommendation that we continually re-assess exploitable content throughout the project lifecycle. This will help ensure that any deviations from the exploitation plan are tracked, documented and new innovations or intellectual property are identified, and appropriate exploitation measures put in place.

More so, the development of the right business model for exploitation will accelerate the commercialization of the project result and this in turn will provide a strong business case for replication.

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ANNEX I. Individual Partner Exploitation plans

Project wide measures

The inteGRIDy project is supporting exploitation of the project outputs through the development of robust strategy and by providing support to partners to ensure the success of the exploitation activities. This enables them to develop individual agile exploitation plans that would allow them to commercialise and protect their innovations.

This section provides steps on how individual partners are approaching the exploitation of their exploitable results.

Individual partner exploitation plans

This section provides the inteGRIDy partners' individual exploitation plans. The organisations have been categorised into six groups, in line with the original proposal:

- Large Industrial Companies (ATOS, SIEMENS, ENG, SIVECO, SUNLIGHT)
- DSO/Utilities/Energy Providers (GNF, ELECTRICA, ASM, ASSEM, INNED, PHE, WVT, EAC)
- SMEs (ATK, M7, EMS, UNE, AIGUASOL, TREK, VPS)
- Research and academia partners (CERTH, TEES, UNEW, UNIROMA1, POLIMI, UCY, UCP),
- Non-profit organisations (E@W, ENOVA) and
- Public body (IWC).

The preliminary exploitation plan template consists of the nine following sections:

- A description of the organisation
- Value proposition
- The relevance of inteGRIDy to the organisation
- An overview of the potential exploitable content
- A short description of the individual exploitation plan
- Innovation category
- Commercialisation route
- Target users/customers
- Value proposition and key benefits
- Potential impact on market
- Plan to achieve exploitation approach
- Strategy for the exploitable contents
- Joint exploitable contents
- Business model for the exploitable contents

Large Industrial Companies

Partner	**ATOS**
Organisation profile	Atos SE (Societas Europaea) is a leader in digital services with pro forma annual revenue of circa € 12 billion and 100,000 employees in 72 countries. Serving a global client base, the Group provides Consulting & Systems Integration services, Managed Services & BPO, Cloud operations, Big Data & Cyber-security solutions, as well

	as transactional services through Worldline, the European leader in the payments and transactional services industry. With its deep technology expertise and industry knowledge, the Group works with clients across different business sectors: Defense, Financial Services, Health, Manufacturing, Media, Utilities, Public sector, Retail, Telecommunications, and Transportation. Atos is focused on business technology that powers progress and helps organizations to create their firm of the future.
Value proposition	• Deep technology and industry expertise • Cross sector understanding of digital services
Strategic focus areas	• Defense • Financial Services • Health • Manufacturing • Media • Utilities • Public sector • Retail • Telecommunications • Transportation
How is inteGRIDy relevant to your organisation	inteGRIDy aims to integrate cutting-edge technologies, solutions and mechanisms in a scalable Cross-Functional Platform connecting energy networks with diverse stakeholders, facilitating optimal and dynamic operation of the Distribution Grid (DG), fostering the stability and coordination of distributed energy resources and enabling collaborative storage schemes within an increasing share of renewables. Consequently, the project is demonstrating important steps in the evolution of the European energy system and this will provide key learnings for ATOS which it can make use of within its portfolio of services to the energy industry.
What content could be exploited?	ATOS, as a leading digital services company, will make use of inteGRIDy to enhance its portfolio in the Energy & Utility market. ATOS will use its business network to exploit inteGRIDy results by presenting the developments to the different business lines of the company and in professional fairs.
Approach to exploitation	ATOS aims at playing a pivotal role on the definition, customization and implantation of inteGRIDy's cross-functional modular platform (CMP). The collaborative development of such platform inside the project will provide important knowledge and know-how for the involved team so as to apply the resultant methodologies to internal research and development assets, with the goal to further develop and position them as marketable modules through the company's business lines. Specifically, ATOS commercial interest in inteGRIDy is twofold: CMP needed customization to different cases and application layer optimization in the energy domain, aided by the collaboration with the key players inside the consortium. This will also foster potential replicability of the resultant solution to other scenarios reached via the project Stakeholders. ATOS expects its Big Data service line to

	grow 30% in the following five years, boosted mostly in the infrastructure applications and in two reference markets: banking and energy utilities.
Innovation category	• Products • Services • Software
Preferred commercialisation route (if applicable)	Internal product development
Target users/customers	Energy Utilities
Value proposition and key benefits of innovation	Atos is not currently developing tools as part of its involvement in inteGRIDy project. Nevertheless, the knowledge gained through the coordination of the project and, specially, the leadership on the task of integrating inteGRIDy framework of tools in each pilot will allow to significantly improve the current and future B2B solutions oriented to energy network operators.
Potential impact on market	There is no direct market impact as part of ATOS outcomes for inteGRIDy.
IPR Assessment	No IPR is expected to be needed
Detail action plan to achieve exploitation approach	The envisaged exploitable results for Atos in inteGRIDy are in the form of gained knowledge and skills. Therefore, no path to exploitation is set as per technology/service provision to Atos customers. In any case, being the department involved in inteGRIDy Atos Research and Innovation, the R&D hub for the company, the road to exploit results will rely on the following steps • Identification of potential new ideas of spin-off innovations outputted from inteGRIDy to be further investigated through a new research project. • Exploring new opportunities to strengthen the collaboration with inteGRIDy partner on similar or different research topics. • Provide assistance, if needed, to research organizations or SMEs on the industrialization of low TRL assets coming from the project. Usage of the knowledge gained through inteGRIDy to evolve, enhance or propose novel solutions to enrich Atos portfolio for Energy.
Detail the strategies to exploit content	As per the same reasoning in the previous field, there are no concrete strategies for Atos inteGRIDy outcomes so as to exploit the acquired skills. Nevertheless, the overall Atos strategy (as per the company strategic plan for the next three years, Atos Advance

	2021[1]) provides a clear way forward in this respect, and all the know-how produced as an outcome of inteGRIDy will be used following these lines: • Complete the transition to Cloud and accelerate the transformation of the Infrastructure & Data Management' business • Accelerate the Industry specific Digital business transformation • Provide the high-end computing for Big Data algorithms, Cybersecurity and Mission Critical technologies • Delivering the next wave of Digital transformation, increasing the focus on industry verticals and solutions Particularly on the energy sector, this strategy is transposed into three main pillars, aligned with the Energy value chain: • Connect generation facilities & enhance equipment reliability (Maintenance optimization, Asset integrity, Value-based maintenance) • Enable real-time grid management (Asset optimization, Smart grid and meters, Intelligent network) • Deploy smart & eco-friendly customer journey (Superior Customer Experience, Smart energy services, e-mobility) inteGRIDy innovations are very much oriented to the second item, as it applies to the distribution grid, but some insights will be also used on the two other pillars.
Will other inteGRIDy partner(s) be involved in the exploitation of this contents? If yes, then how?	No
Any other exploitable result (i.e. another product), which has been recognised as complementary, and thus might be marketed together with the described exploitable result under certain conditions.	No
Business model for the exploitable contents	Given that Atos is not exploiting a particular technology to a target market, no related Business Models have been identified in the

[1] https://atos.net/en/2019/press-release_2019_01_30/atos-2019-investor-day

	project. The exploitable outcome is in the form of knowledge gained for the team.

Partner	**SIEMENS**
Organisation profile	Siemens is involved in more than 200 countries globally focusing in the areas of electrification, automation and digitalisation. One of the world's largest producers of energy – efficient, resource-saving technologies, Siemens is No. 1 in offshore wind turbine construction, a leading supplier of combined cycle turbines for power generation, a major provider of power transmission solutions and a pioneer in infrastructure solutions as well as automation and drive and software solutions for industry.
Value proposition	• 170 years of experience in the energy industry • Highly innovative with over 4,500 patents filed per year • Expertise across the full energy value chain
Strategic focus areas	• Electrification • Digitalisation • Automation
inteGRIDy's relevance in Siemens' current business model	The energy industry is rapidly evolving and as an OEM Siemens must conduct a process of continual research and development. As one of Europe's leading smart grid projects, inteGRIDyinteGRIDy will provide key learning for how to integrate cutting-edge technologies in order to optimise the operation of the Distribution Grid and deepen the penetration of distributed energy resources and storage. Consequently, it is very relevant to Siemens' current business model and will provide intelligence on a number of matters such as the market environment, regulatory context and technological framework. Siemens is seeking to adopt new service orientated commercial models and be actively involved in technological disruption, therefore inteGRIDy will also produce some significant insight into emerging business model innovation across Europe.
Exploitable content	Siemens will generate significant knowledge and insight through its involvement inteGRIDy. The policy review that we will participate in will produce a great deal of learning on the regulatory environment that exists across different territories within Europe. Also, our contribution towards the cyber security framework will engender us with practical lessons that can be applied on other projects. The main exploitable content for Siemens will be the work on the Isle of Wight pilot, where we are deploying a novel system to offer greater flexibility to the DNO. The innovation can be summarised in three points: • We will provide new and innovative demand side management strategies that enable live bureau market participation. The building owner/operators will be able to reduce hedging commitments and overall energy consumption whilst increasing the flexibility in line with grid operator requirements. • Inside the building we are deploying high numbers of sensors and other field devices that will enable us to

	increase the size of flexible load and participate in more demand response events. • Introducing an array of sensors to improve the process of aggregating load across multiple buildings.
Approach to exploitation	Siemens will define an exploitation strategy that will detail all of the steps we will take to commercialise and protect the innovations we generate on inteGRIDy. At this initial stage our approach can be summarised as: • inteGRIDy as a reference: Siemens will exploit the innovations by producing case studies and references that we will disseminate at meetings, conferences and via marketing channels. • Replicable system architecture: Siemens will define a replicable system architecture on our Isle of Wight pilot which we intend to re-use where possible with other municipalities across Europe. • Re-deploy knowledge: Siemens will embed the learning we have generated during inteGRIDy within our organisation and use it to inform decision making on projects, business cases and R&D activities. • Leverage relationship: Siemens will look to continue to build relationships with the inteGRIDy partners such as UCP, Teesside University and Minus 7 with the aim of generating additional value for our customers through the expertise and innovation that exists within these partners.
Innovation category	• Services • Prototypes • Software
Preferred commercialisation route (if applicable)	• Internal product development • Licensing • Consultancy
Target users/customers	Commercial and Residential users/buildings
Value proposition and key benefits of innovation	Demand Side Response to enhance grid optimisation and flexibility.
Potential impact on market	Suitable grid optimisation.
IPR Assessment	*Yes*
Detail action plan to achieve exploitation approach	- InteGRIDy as a reference: Siemens will exploit the innovations by producing case studies and references that we will disseminate at meetings, conferences and via marketing channels. - Replicable system architecture: Siemens will define a replicable system architecture on our Isle of Wight pilot

	which we intend to re-use where possible with other municipalities across Europe. - Re-deploy knowledge: Siemens will embed the learning we have generated during InteGRIDy within our organisation and use it to inform decision making on projects, business cases and R&D activities. - Leverage relationship: Siemens will look to continue to build relationships with the InteGRIDy partners such as UCP, Teesside University and Minus 7 with the aim of generating additional value for our customers through the expertise and innovation that exists within these partners.
Detail the strategies to exploit content	Siemens will engage the IPR plan to patent the new solution. Multiple marketing literature and conference attendance and customer meetings will ensure knowledge of the Integridy reference is shared for scaling and commercialisation purposes.
Will other inteGRIDy partner(s) be involved in the exploitation of this contents? If yes, then how?	Yes, IOW council will be allowing access to their buildings to demonstrate the technology working within them.
Any other exploitable result (i.e. another product), which has been recognised as complementary, and thus might be marketed together with the described exploitable result under certain conditions.	Not at this time.
Business model for the exploitable contents suitable?	*Yes*

Partner	**ENGINEERING**
Organisation profile	Engineering Ingegneria Informatica S.p.a. is a leading provider of advanced Information Technology systems and services to diverse commercial and governmental customers, with a particular attention to the Energy and Smart Grid sector. Engineering Group has more than 9,000 employees spread across 50 sites in Italy, Germany, Spain, Belgium, Republic of Serbia, South America and United States. It has a consolidated revenue portfolio in 2016 of about 934 million Euros. The group delivers IT innovation to more than 1.000 large clients, with a complete offer combining system and business integration, outsourcing, cloud services, consulting, and proprietary solutions. Engineering Data Centres, via EngMO, offer business continuity and IT infrastructure management to about 15.000 servers and 230.000 workstations. The Engineering Group operates through 7 business units; its innovation capability is supported by the Central Unit of Research & Development, with around 250 researchers currently involved in over 50 research projects co-funded by national and international authorities. The R&D Unit is located across 6 different locations in Italy and in Europe.
Value proposition	• Deep technology and industry expertise • Cross sector understanding of digital services • A complete offer of business integration, application and infrastructure outsourcing, innovative solutions and strategic consultancy
Strategic focus areas	• Public Administration & Healthcare, • Telco & Utilities, • Industry & Services, • Finance
How is inteGRIDy relevant to your organisation	inteGRIDy is relevant to ENG in a number of ways. The company has significant interests in the energy industry and is involved in numerous smart grid research projects, such as STORE&GO, an H2020 Energy Storage Large Demonstration project to evaluate the effectiveness of power to gas to balance intermittency due to high penetration of renewable fluctuating energy sources. ENG's focus on inteGRIDy will be the definition of the overall inteGRIDy architecture including the scenarios and use cases as well as the integration of a range of components, tools and methodologies. ENG will also contribute towards tasks related to the optimisation of energy flows, a topic that has been widely developed in large projects like INGRID. As large enterprise and IT company ENG will also contribute to the definition of business models for the inteGRIDy future sustainability.
What content could be exploited?	Many results of the inteGRIDy project can be exploited by ENG. As responsible partner for the overall architecture and of its implementation as Cross Functional Modular Platform (CMP), ENG will have a deep knowledge of the wide variety of technologies that

	inteGRIDy is inheriting from previous projects and that are being customised, integrated, extended to address emerging needs coming from energy prosumers and DSOs. Also, intangible results will be exploited: market analysis, stakeholder needs, new business models mapped onto the European framework of regulation will be for ENG an opportunity to extend the energy and utilities business area outside national frontiers.
Approach to exploitation	ENG is a very active player in the ICT for Energy Management and Smart Grid domain. With this regard, the Energy & Utilities General Division is fully involved in delivering effective ICT solutions for the energy and the multi-utility market. However, ENG has also a long and consolidated experience in national and European co-funded research projects, tailored the Smart Energy Grid. So, the approach to exploitation will be twofold: a new and more competitive IT service and solution offering to the Energy&Utilities market in which ENG already supplies many big customers (Terna, e-Distribuzione, Acea, E.On, Eni, etc.); a deeper knowledge of the more recent technologies for the Smart Grid to be exploited in even more challenging research initiatives. Indeed, expertise and skills developed inside the project will increase the already important knowledge and know-how of the involved team giving ENG the chance to profitably continue its research activity in European projects in the Energy Management and Smart Grid domain.
Innovation category	Software
Preferred commercialisation route (if applicable)	Internal product development
Target users/customers	Energy managers, micro-grid owners
Value proposition and key benefits of innovation	The framework composed by the three tools provided by ENG constitutes an advanced an innovative smart grid Energy Management System that can be adapted, installed, and deployed in a wide range of energy contexts, from urban grids to industrial plants. The key proposition of this solution is to provide a software platform allowing the users, as well as the managers, of modern smart energy resources to implement Demand Response programs, and other smart scenario in power grid management (e.g. Renewable Energy Systems or Distributed Generation integration), by exploiting the flexibility of the energy systems operating within the grid under control. These actions have a beneficial economic impact for the customers since, thanks to the ENG tools developed inside inteGRIDy, customers can increase their incomes. Indeed, this innovative solution relies upon a multi-objective management process that takes also into account the technical requirements of the grid operator allowing to maximise the revenues or the incentives rewarded for the provision of grid services in terms of flexibility. Furthermore, the users of ENG tools can minimise the energy supply

	cost, taking into account the features of devices like storages and small-scale local generators.
Potential impact on market	The proposed solution addresses a specific market portion in the management of flexibility as whole, aiming at managing and gathering flexibility contributions coming from several energy systems dealing with different energy. It is particularly suitable for complex and multi-carrier energy systems, providing a complete software solution for the management of the energy flows within a smart energy context. The advantages with respect to the other competitors relies on the multi-objective engine of the management core, the possibility of handling different energy carriers and the great adaptability to very different energy contexts.
IPR Assessment	The solutions developed inside the inteGRIDy project will be re-engineered obtaining at the end proprietary solutions.
Detail action plan to achieve exploitation approach	Regarding the Energy&Utilities market in which ENG already supplies many big customers, the exploitation plan consists in the next planning of meetings between the research team involved in the inteGRIDy project and the ENG Energy & Utilities General Division. During that meetings, ENG research team will explain the output of the project actively supporting Energy & Utilities General Division in the research of a more complete and more competitive IT service and solution offering. Regarding new research initiatives, ENG plan consists in the exploitation of the outputs of the project as starting point for new proposal writings in order to continue ENG research activity in European and Italian projects in the Energy Management and Smart Grid domain.
Detail the strategies to exploit content	ENG exploitation strategy for the overall architecture and of its implementation as Cross Functional Modular Platform (CMP) consists in the investigation, with the ENG Energy & Utilities General Division, of the possibility of integrating ENG inteGRIDy outputs with the already existing ENG offering. The intangible results listed in answer 5 above, instead, will lead the ENG team involved in the inteGRIDy project to a more competent participation in other research projects in the Energy Management and Smart Grid domain in which the team is already involved and in which it will participate in the next years.
Will other inteGRIDy partner(s) be involved in the exploitation of this contents? If yes, then how?	NA
Any other exploitable result (i.e. another product), which has been recognised as complementary, and	NA

thus might be marketed together with the described exploitable result under certain conditions.	
Business model for the exploitable contents suitable	NA

Partner	**SIVECO**
Organisation profile	SIVECO is the leader of Romanian software houses and one of the most successful regional leaders in Central and Eastern Europe with 600 employees worldwide and a total revenue of 46,8 million EUR in 2016. The company develops and exports IT solutions and consultancy projects with high added value to countries from the European Community, Middle East, North Africa and the Commonwealth of Independent States area. SIVECO delivered large and complex IT projects for education, health, agriculture, customs organizations, European institutions, private companies and public sector. National and international prizes and a top position in the IT Services Market in Romania with a 5.4 % market share in 2015, according to a study published by International Data Corporation. New innovative products and services added to the company's portfolio recently and the strategy was adapted to roll-out new business models and to attract new clients.
Value proposition	• 25 years of worldwide expertise in developing and implementing complex IT solutions (over 3550 projects in 27 countries) • Systems that provide integrated control of organizational activities and processes, in full compliance with national legislative regulations • Highly skilled professionals and a proven experience with complex projects • Strategic partnerships with world leaders a local player form IT market
Strategic focus areas	• Agriculture • Health • Public Administration • Education • Customs • EU institutions • Defence • Energy
How is inteGRIDy relevant to your organisation	In this project SIVECO will participate in all stages of the solution development, starting with the analysis of use case requirements, the definition of the Conceptual Architecture - Functional & Technical Specifications, and will be the main technical partner leading the integration of the sub-components, and will also take part in the Back-end Platform demonstration and evaluation activities and also in the management, dissemination, exploitation and communication activities. SIVECO will support the use case for Demand Response by providing the development of the core integration platform, Intelligent Energy Demand & Supply matching feat Innovative Simulation & Command – Control for Energy Grids.

Exploitable content	SIVECO, as an IT leading company, will use inteGRIDy results to develop new business models and to attract clients from energy distribution. SIEVCO will use its business network to exploit inteGRIDy results by presenting the developments to the different lines of business inside the company and in dedicated events.
Approach to exploitation	SIVECO aims at playing a key role in the definition, development and deployment of inteGIRDy's cross-functional modular platform (CMP). The team engaged in the collaborative development inteGRIDy will be exposed to huge amount of knowledge and know-how. The resultant methodologies will be used in internal research and development assets aiming at developing new business models to access new markets via company's dedicated line of business. SIVECO's commercial interest is in customizing the inteGRIDy CMP for different business cases, mainly DSO and in fostering replicability of the solution.
Innovation category	• Products (EIIS - Energy Integrated Information System) • Services • Software (e.g. smart DR algorithms, software applications)
Preferred commercialisation route (if applicable)	• Internal product development • Assignment of IP to third party (B2B) • Licensing • Joint Venture • Consultancy (ICT)
Target users/customers	Based on the proposed business models, the target users/customers for SIVECO are: • DSOs • Public Utility companies • Electricity suppliers • Consumers (B2B2C)
Value proposition and key benefits of innovation	Value Propositions of the solution / product: • Intelligent measuring / modelling / monitoring (smart algorithms and customized modules) • DSO – oriented solution (focused on the DSO' demands and benefits) • Consumer profile driven solution • Centred on the consumption optimization and efficiency • Alerts and notifications

	• Based on innovative technologies and open architecture capable to integrate both realistic data and data provided by simulation programs/applications • Capability to validate various business models, compliant with the specific of the targeted market. Key benefits of innovation: • Optimizing the energy consumption • Costs reduction, energy savings • Consumers can track and manage their consumption • Consumers can make informed decisions • Empowering the staff of the DSOs, Public Utility companies, electricity suppliers • Ensuring a better forecast of the energy consumption and energy losses • Ensuring the process transparency and the clarity of roles and responsibilities (DSO).
Potential impact on market	The proposed list of Value Propositions represents the base of the exploitation strategy, given that it is used to understand the target users / customers' needs and the benefits offered by the solution. The purpose of implementing the EIIS (Energy Integrated Information System) within the Ploiesti Pilot is to ensure a Demand Response Smart Grid for a residential area, where the buildings' energy management and control system will function based on intelligent DR algorithms. After the evaluation of the Pilot outcomes, similar solutions to the one tested in the project would be applied for residential buildings/areas on a larger scale. Our aim is to replicate and deploy similar DR solutions in other residential areas, including not only residential buildings, but also other types of commercial surfaces (shops, malls). In this purpose, one of the targeted categories of stakeholders which would be interested in our commercial effort is represented by the real estate operators / agents. In order to evaluate the potential impact on market, specific studies and prospects on the targeted market will be achieved. The analysis of EIIS as marketable solution / product will be based on USP (Unique Selling Proposition or Unique Selling Point) marketing approach, addressing the competitive advantages of the solution against similar Smart Metering solutions / platforms existing on the Romanian market. The competitive advantages will be determined through a benchmarking analysis.
IPR Assessment	SIVECO will generate a new intellectual property on (EIIS - Energy Integrated Information System) and will respect the stipulations of the IPR agreement concerning the relations between SIVECO and the other members of the Consortium during the commercialization of inteGRIDy platform.

Detail action plan to achieve exploitation approach	- Participating actively in the definition, development and deployment of inteGRIDy's CMP (Cross-Functional Modular Platform), based on the significant knowledge and know-how in IT field: ▪ System integration design ▪ Selecting the appropriate approach of integration (conceptual and logical), standards and protocols (data handling) ▪ Defining the development environment for integration ▪ Defining the deployment environment for integration ▪ Designing the integration process (how the individual components / tools are integrated into the system within a number of different iterations) ▪ Implementing the integrated solution (inteGRIDy Integrated prototype) ▪ Testing of the integration. - Using the proposed methodologies (integration – development and deployment and testing – using an innovative combination of principles and practices specific to Agile and V-Model) in internal research and development (Business Solutions department) as assets of implementing complex IT projects and developing new business models to access new markets - Drafting the business plan and Go-to market strategy based on the proposed business models (B2B and B2B2C) Fostering the solution replicability (particularly implementing the Ploiesti Pilot results).
Detail the strategies to exploit content	- Developing and validating the most appropriate business models for Ploiesti Pilot, based on a rigorous analysis of different business models / patterns specific for the energy sector (e.g. Pay-per-Use, Smart Metering, Software Applications, Value-Added Enabler, ...), focused on attracting clients from energy distribution on the Romanian market - Drafting the BMC (Business Model Canvas) - Defining the most suitable VPC (Value Proposition Canvas) for the solution and services - Positioning EIIS (Energy Integrated Information System) as marketable solution/product, based on the defined USPs (Unique Selling Points / Propositions) - Defining the Roadmap (preliminary Go-to market strategy), based on the positioning findings - Drafting the individual exploitation plan (addressing the following aspects: *Why does the project exist? Big Goal / Objective; What are we building to accomplish this?; How will we build this project?; What is the work to be done in the coming months? / Key activities (including events, workshops, other dissemination activities...); Measurable outcomes*) based on our own business network, compliant with the stipulations of the IPR Agreement.
Will other inteGRIDy partner(s) be involved in the exploitation of this	- Yes, we would involve in the exploitation of this contents and collaborate with all inteGRIDy partners which handle and implement all types of functionalities specific for *DR (Demand Response) field*

contents? If yes, then how?	- Establishing a common framework for exploiting the project results, taking into the consideration the specific of each Pilot / partner: defining a uniform exploitation approach / roadmap, defining and validating the most suitable business models, organizing common events / workshops.
Any other exploitable result (i.e. another product), which has been recognised as complementary, and thus might be marketed together with the described exploitable result under certain conditions.	The main aspects concerning the exploitation approach are enclosed in the IPR Agreement. The IPR Agreement covers the general and individual obligations of the parties in connection with the scope of exploiting *the* foreground resulting from the project. The exploitable foreground of inteGRIDy could be ranged in the following groups: for further research, for internal development, for developing and commercialize a marketable product / solution / tool, for creating and for creating and providing a service for others (e.g. joint venture/partnership, licensing). As presented earlier, in the survey for Task 3.4, SIVECO aims to exploit the project results, as follows: - Internal product development - Assignment of IP to third party (B2B) - Licensing - Joint Venture - Consultancy / further research - IT field (B2B, B2B2C). If the exploitation approach would require cooperation (joint exploitation under certain conditions) with the other partners for any of the aforementioned directions, the way the results could be jointly exploited will be in line with the IPR Agreement stipulations and recommendations concerning the relations between SIVECO and the other members of the Consortium during the commercialization of inteGRIDy platform.
Business model for the exploitable contents suitable	Yes, all information provided in T3.4 is suitable to drive our exploitation strategy described above.

DSO/Utilities/Energy Providers

Partner	**GAS NATURAL FENOSA**
Organisation profile	Gas Natural SDG S.A. is the parent company of the Gas Natural Fenosa group. It is a multinational energy services group whose activities include generation, supplying, distributing, commercialization of natural gas and electricity business. Gas Natural Fenosa (GNF) is a leading multi-national in the gas and power sectors operating in 23 countries, with more than 20 million customers. Following the acquisition of Unión Fenosa, Spain's third biggest power company, GNF has achieved its objective of integrating its gas and electricity businesses in a single company, capable of competing efficiently in energy markets subject to a process of increasing integration, globalisation and levels of competition. It is the largest integrated gas and power company in Spain and Latin America, leading the natural gas sales market in the Iberian Peninsula, and is the world's third largest liquid natural gas (LNG) operator, with a fleet of 13 methane carriers. It is the biggest supplier of natural gas and LNG in the Mediterranean and Atlantic basin. Market leader in the distribution sector it is present throughout the entire gas value chain, with investments in exploration, production, liquefaction and transport operations. Other company of the GNF Group is Gas Natural Servicios SDG S.A., specialized in knowing the different customers' needs in order to offer customized products and services in a standardized model, contributing both to increase the margin for our customers, offering energy efficiency related services, and to a better environmental performance. Gas Natural Servicios also develops projects for improving the efficiency of energy use, providing services to almost 2,500 customers in Spain. In order to achieve this aim, they implement complete solutions to their customers. The third company of the group participating in the project is Gas Natural Informática S.A. that provides and implements innovative technology solutions ensuring operational efficiency, process excellence and key data treatment for decision making and achieving goals. They are experts on communications, hardware and software solutions for data centres. In this initiative will participate the Engineering Company of the Gas Natural Fenosa Group: Gas Natural Engineering. They act as engineering company that designs the actions to implement in the projects and work in the assessment of the solutions.
Value proposition	• A multinational energy services group with expertise in a range of fields including generation, supplying, distributing, commercialization of natural gas and electricity business.
Strategic focus areas	• Smart Grid Integration • New Business Models Development • Smart Cities • Energy efficiency • Renewable Energies • Demand Side management • smart metering technologies

	• Electrical storage via Li-Io battery
How is inteGRIDy relevant to your organisation	GNF is one of the biggest Spanish utilities, and currently act as an ESCO in as DSO is Spain and in other European and American countries. Thanks to its experience and availability of information, GNF can contribute in different tasks alongside the duration of the project. The proposed large pilot use case for Spain is a sport center, where GNF, with the help of AIGUASOL, is developing some energy savings proposals, within the European Project "GrowSmarter". In this building, GNF currently acts as an ESCO. Thanks to its experience and to the possibility to use its living lab for testing, GNF can contribute to analyse different management strategy, in order to validate the new business models proposed within inteGRIDy. Furthermore, GNF can enhance the diffusion of inteGRIDy results thanks to its participation in EASE (European Association for Storage Energy)
What content could be exploited?	Within the project duration, GNF will make use of the CMP to test the viability of the use cases defined at the Barcelona pilot site. The tools developed during the project are expected to be integrated to the service portfolio of the energy service company. In addition, the CBA methodologies and the KPI's defined within the project will be useful for GNF to build an own procedure to quantify viability of future replications.
Approach to exploitation	In a service based-model, GNF is creating a value proposition around energy services that brings value to the customer and answers the current energy challenge. GNF is developing services that enhances user experience, harvest the benefits of the digitalization on both customer and network, minimizes energy costs, ensures a secure energy supply and minimize emissions. GNF expects to integrate the CMP to its own service portfolio and continue developing functionalities to comply with all range of GNF's client's specificities. The replicability of this pilot case in Barcelona will be analysed throughout the project in order to ensure that inteGRIDy's outputs are appropriate to GNF's client's specificities.
Innovation category	1. Services
Preferred commercialisation route (if applicable)	I. Internal product development
Target users/customers	The tools developed during the project are expected to be integrated to the service portfolio of the energy service company. Consequently, target customers are current or future clients of GNF interested in energy efficiency measures and specifically on demand response programs.
Value proposition and key benefits of innovation	GNF value proposition is the development of a service-based model which can satisfy the needs of its clients. Energy services bring value to the customer by offering them multiple benefits such as an enhancing user experience via the service personalization, minimization of the energy cost via an explicit control of their assets among others. Furthermore, it gives an answer to the current energy

	challenge by minimizing emissions, ensuring a secure energy supply and adapting the energy value chain with regards to new technologies and digitalization techniques. Innovation in such an evolving area is constantly necessary in order to respond to the new challenges that arise and to be able to comply with the additional needs of customers and society as a whole. GNF seeks to progress by acquiring innovative solutions and continuing developing functionalities to satisfy future needs.
Potential impact on market	Solutions developed in inteGRIDy will impact directly a large sport centre in Barcelona within the project. The direct replication potential could be extended to all flexible photovoltaic installations and tertiary buildings refurbished within the Horizon 2020 projects carried out by GNF. Eventually, the replication potential of GNF is about 1,800 tertiary buildings managed by the energy service company within GNF. The development of an improved energy service can positively impact the market by introducing new technologies and optimizing processes to solve current challenges. Thanks to the inclusion of storage technologies, the DR optimization and the flexibility offer to markets a reduction of the energy cost, and a reduction in emissions can be achieved. Moreover, grid congestion can be relieved and an alternative to expensive investments to increase grid capacity can be found.
IPR Assessment	No
Detail action plan to achieve exploitation approach	NA
Detail the strategies to exploit content	NA
Will other inteGRIDy partner(s) be involved in the exploitation of this contents? If yes, then how?	No
Any other exploitable result (i.e. another product), which has been recognised as complementary, and thus might be marketed together with the described exploitable result under certain conditions.	No, there aren't any other exploitable results that have been recognised as complementary.
Business model for the exploitable contents suitable	The business model related to T3.4 has not been defined yet.

Partner	**ELECTRICA**
Organisation profile	SDFEE Electrica S.A ("Electrica") is a Romanian power distributor and supply (DSO), including the communications infrastructure and energy services. In 2010, Electrica SA had a 25% market share of the electricity supply, with a total of 3,505,290 customers. Electrica SA has the greatest amount of assets under management within Romania, with 36% of the country's electrical networks at various voltage levels (230V - 110kV), against ENEL (29%), CEZ (18%) and EON (17%). Electrica SA serves 18 of the 42 counties in Romania, which is approximately 42% of the consumers in the country.
Value proposition	• Quality of energy supply on a large scale across Romania • Utilising innovative technologies for the benefit of customers and the environment
Strategic focus areas	• Developing and extending services through partner companies • Research and implementation of wind and solar renewables
How is inteGRIDy relevant to your organisation	ELECTRICA, as the DSO partner, will coordinate the demonstration of the proposed technologies on their experimental premises, by allowing access to the data FTP server from smart metering units in the given locations, as well as setup new infrastructure to test out various communication protocols and network communication infrastructure. Further, ELECTRICA will allow the realisation of the inteGRIDy pilot use cases over their distributed assets and facilities, leading deployment, monitoring and control of local micro-grids, as well as the validation of DR mechanisms in offline simulations and real-time operation in small- and large-scale pilots. Particularly in the Romanian use case, the energy demand and supply are matched by means of intelligent systems aiming at delivering a direct impact on overall energy consumption. Electrica will develop an innovative infrastructure with energy consumers and energy providers whose demand and supply of energy will be monitored. The aim is to reason on energy consumption and provision such that, by optimizing (reducing) the overall energy consumption a positive impact on the environment can be ensured.
What content could be exploited?	ELECTRICA, as a large Romanian DSO will use inteGRIDy results to improve the services provided and to provide innovative energy distribution service packages. ELECTRICA will use its business network to exploit inteGRIDy results by presenting the developments to the different lines of business inside the company and in dedicated events.
Approach to exploitation	ELECTRICA aims at playing a role in defining new business models and preparing for market new packs of energy services.

Innovation category	i. Products (EIIS - Energy Integrated Information System) ii. Services
Preferred commercialisation route (if applicable)	i. Internal product development ii. Assignment of IP to third party (B2B) iii. Including EIIS in the portfolio of Suppliers
Target users/customers	i. Electricity suppliers ii. Consumers (B2B2C)
Value proposition and key benefits of innovation	Value Propositions of the solution / product: ▪ Intelligent measuring / modelling / monitoring (smart algorithms and customized modules) ▪ DSO – oriented solution (focused on the DSO' demands and benefits) ▪ Consumer profile driven solution ▪ Centred on the consumption optimization and efficiency ▪ Alerts and notifications ▪ Based on innovative technologies and open architecture capable to integrate both realistic data and data provided by simulation programs/applications ▪ Capability to validate various business models, compliant with the specific of the targeted market. Key benefits of innovation: ▪ Optimizing the energy consumption ▪ Costs reduction, energy savings ▪ Consumers can track and manage their consumption ▪ Consumers can make informed decisions ▪ Empowering the staff of the DSOs, Public Utility companies, electricity suppliers ▪ Ensuring a better forecast of the energy consumption and energy losses ▪ Ensuring the process transparency and the clarity of roles and responsibilities (DSO).
Potential impact on market	The proposed list of Value Propositions represents the base of the exploitation strategy, given that it is used to understand the target users / customers' needs and the benefits offered by the solution. The purpose of implementing the EIIS (Energy Integrated Information System) within the Ploiesti Pilot is to ensure a Demand Response Smart Grid for a residential area, where the buildings' energy management and control system will function based on intelligent DR algorithms.

	After the evaluation of the Pilot outcomes, similar solutions to the one tested in the project would be applied for residential buildings/areas on a larger scale. Our aim is to replicate and deploy similar DR solutions in other residential areas, including not only residential buildings, but also other types of commercial surfaces (shops, malls). In this purpose, one of the targeted categories of stakeholders which would be interested in our commercial effort is represented by the real estate operators / agents. In order to evaluate the potential impact on market, specific studies and prospects on the targeted market will be achieved. The analysis of EIIS as marketable solution / product will be based on USP (Unique Selling Proposition or Unique Selling Point) marketing approach, addressing the competitive advantages of the solution against similar Smart Metering solutions / platforms existing on the Romanian market. The competitive advantages will be determined through a benchmarking analysis.
IPR Assessment	ELECTRICA will generate a new intellectual property on (EIIS - Energy Integrated Information System) and will respect the stipulations of the IPR agreement concerning the relations between ELECTRICA - SIVECO and the other members of the Consortium during the commercialization of inteGRIDy platform.
Detail action plan to achieve exploitation approach	Carrying out the analysis corresponding to the definition of new business models and the preparation of new energy services packages on: - the internalisation of design services, - internalization of maintenance services, building on experience in the field of power distribution.
Detail the strategies to exploit content	The exploitation strategy is based on: • The opportunity for access to the leading energy technologies that the OD will use to optimize the operation of the electricity distribution networks (RED) in the conditions of connection to the grid of the renewable electricity generation or power grid SEN • Making decisions in the field of energy efficiency promotion by using DR (VPP) solutions by corroborating information from the Demand Response intelligence platform for the Ploiesti site with information retrieved from a smart metering platform to validate DSM (demand) -side management) for real-time monitoring of electricity consumption and promotion of corrective actions on the electricity market • will take over and possibly develop advanced RED monitoring models from pilot projects to improve the real-time

	estimation of energy discharged by green energy producers and the integration of energy storage systems • the possible use of a smart metering infrastructure for assessing security and data protection and identifying cyber-risk management solutions
Will other inteGRIDy partner(s) be involved in the exploitation of this contents? If yes, then how?	• We intend to involve other partners of the InteGRIDy Project that use the DR facilities by corroborating DR platform intelligence data for the Ploiesti site with information retrieved from a smart metering platform (possibly AACHEN) • We intend to share the results of the project on the basis of the characteristics of each activity, collaborating in the organization of dissemination activities of the information / results obtained by carrying out the specific activities.
Any other exploitable result (i.e. another product), which has been recognised as complementary, and thus might be marketed together with the described exploitable result under certain conditions.	When using other exploitable results, the IPR agreement that sets out the general and individual obligations of the parties in relation to the purpose of exploiting the results obtained from the project will be considered. Other categories of exploitable results following the InteGRIDy project could be: - assessing security and data protection and identifying cyber-risk management solutions - providing consultancy in partnerships with other DSOs. ELECTRICA aims to exploit the results of the project by: - taking over and possibly developing advanced RED monitoring models to improve the real-time estimation of energy discharged by green energy producers and the integration of energy storage systems; - Validation of demand-side management (DSM) programs and specific business models (WB) for real-time monitoring of electricity consumption and promotion of corrective actions on the electricity market If exploitation involves cooperation with other partners for any of the above-mentioned directions, the way the results could be jointly exploited will be in accordance with the IPR Agreement on ELECTRICA Relationships with the other Consortium members during the commercialization of the InteGRIDy platform
Business model for the exploitable contents suitable	Yes, the information in T3.4 is suitable for running the exploitation strategy.

Partner	**INNED**
Organisation profile	INNED is a French SME involved in activities in the energy domain and more specifically in the areas of PV energy production, electrochemical energy storage and energy distribution. INNED is a member of the SOREA group and is responsible for measurements and implementation of technical solutions (in the frame of R&D projects) with the aim to enhance the reliability and stability of the distribution grid in the Maurienne Valley area in France. In this sense INNED comprises the technical arm of SOREA and contributes to the distribution grid management. INNED/ SOREA is active in electricity production and distribution and operates its own grid with hydropower and photovoltaic production. The grid supplies 18 000 customers (counters), private people and industry in the Maurienne Valley in France, near the Italian border. INNED has to permanently improve the quality of its grid and supply services by testing and adding new devices or equipment's and through new services to customers. An important objective of INNED is to increase the part of renewable energies from the present 35% (mean annual value) to more than 60% within 4 years. This also requires a better use of energy and a reduction of the energy consumption. INNED is also a player in the development of clean transports, including EVs or hydrogen cars and busses, particularly in the Maurienne Valley in connection with the ski resorts.
Value proposition	• Expertise in renewable energy and electricity distribution
Strategic focus areas	• Electricity generation and distribution • PV system and storage • Renewable integration to distribution grids • Electrochemical energy storage • Energy distribution
How is inteGRIDy relevant to your organisation	INNED will be involved in the pilot deployment activities of the project, providing access to their clients' buildings to validate novel Demand Response and Virtual Energy Storage technologies and associated business models. INNED distributes over 140 GWh of electricity every year, with peak demand of 42 MW (peak power period). 31% of the total annual electricity is produced by renewables, namely PVs and small hydro plants, with the aim to reach 60% in 2020 and 100% in 2030. Currently there is no storage installed at the INNED network, however there are plans to feed the gas grid (still in St-Jean) with methane using Power to Gas conversion and storage technologies. This grid is operated by GRDF, the national gas distribution company and fed by RTgas, the national transport gas company. GRDF is interested in buying methane produced by SOREA and initial discussions on the project will start within 2017. INNED also plans to produce hydrogen from electrolysis, particularly to use low cost electricity at high production time of hydro power

	plants. The aim is to use hydrogen as energy storage and produce electricity in a fuel cell, or to feed the gas grid with up to 6 vol% H2. inteGRIDy will allow INNED to take part to one of the key research & development project in the field of energy in the EU. INNED will use innovative technologies whose purpose is to enhance the share of renewables taking in account resources of the grid and involving residential stakeholders to develop demand response in buildings.
What content could be exploited?	As a DSO, INNED will make use of the inteGRIDy technologies to perform a suitable demonstration which will give the line to follow for futures large scale developments to be implemented on the grid.
Approach to exploitation	INNED aims at improving the grid stability due to the study of technology and knowledge diversity provided by inteGRIDy consortium. In order to get an increasing efficiency of the electrical balance with a strong dependence to the seasons in our region, skills from the consortium will be an asset that will enable to foster our capacity to take advantage at best of Renewable Energy Sources available on the grid and thus, to use a proper business model in line with our activity.
Innovation category	• Services
Preferred commercialisation route (if applicable)	• Internal product development • Assignment of IP to third party
Target users/customers	Residential users & Commercial buildings
Value proposition and key benefits of innovation	Demand Response operated to enhance grid flexibility.
Potential impact on market	Suitable grid operation correlated to the energy markets.
IPR Assessment	No
Detail action plan to achieve exploitation approach	
Detail the strategies to exploit content	
Will other inteGRIDy partner(s) be involved in the exploitation of this contents? If yes, then how?	
Any other exploitable result (i.e. another product), which has	

been recognised as complementary, and thus might be marketed together with the described exploitable result under certain conditions.	
Business model for the exploitable contents suitable	

Partner	**ASSEM**
Organisation profile	A.S.SE.M. S.p.A. has been established on March 29, 1919 as **AEM** (Municipal Electric Company) with the aim of starting a direct management of municipal electrical plants for producing and distributing electricity for civil and industrial uses, as well as providing public and private lighting service to the city of San Severino Marche, a small town in the center of Italy in the province of Macerata. Throughout history, the company undergoes various transformations ranging from the approval of the first regulation in 1924, to its subsequent modifications in the years 1960 and 1968. In 1972, an extraordinary session of the municipal council of San Severino Marche approves a significant reform, and the new regulation leads to the creation of the ASSEM (Special Company for Municipal Electrical Services). On January 1, 1995, once again, the council resolution of December 28, 1994, transforms the Special Company into a public economic entity under Law 142/1990. ASSEM keeps its name the structure is different: it becomes the San Severino Marche Company - Municipal Services Management (**A.S.SE.M.**). On June 27, 2000, A.S.SE.M. is finally transformed into a Ltd, **A.S.SE.M. S.p.A.** This transformation highlights the intention of the municipality of San Severino Marche, currently the only shareholder, of improving the company's competitiveness, increasing the quality of services provided to users with a positive impact on the community. In 2009 the company was divided into **A.S.SE.M. Patrimonio S.r.l.**, which owns the grids, buildings and power plants, and **A.S.SE.M. S.p.A.**, responsible for the management of gas, electricity, public lighting, water supply and purification services in the municipal area of San Severino Marche. Other significant moments for the company are those relating to the acquisition of the water service in 1996, of the gas service in 2000 and, most recently, the sewerage service in 2015, all under the municipal area of San Severino Marche. Finally, in 2016 the company A.S.SE.M. S.p.A. acquired the management of the integrated water service also in the spatial sphere of some neighbouring municipalities located in the province of Macerata.
Value proposition	• Expertise in producing and distributing electricity and managing public lighting service
Strategic focus areas	• Medium Voltage (MV) network management • Innovative faults management systems • Smart Distribution System • Monitoring of DG injections • Distribution system protection, monitoring and control

How is InteGRIDy relevant to your organisation	The Medium Voltage (MV) network managed by A.S.SE.M. S.p.A., and the relevant Primary Substation, since 2010 are involved in one of the Smart Grid pilot projects promoted by the Italian Authority for Electricity Gas and Water by Resolution ARG/elt 39/10. The project provided the implementation of a set of innovative features in the electrical distribution system of San Severino Marche, supporting the effective operation of the electrical grid and enabling new services and control strategies involving the active users. The novel functionalities were supported through the installation of a new protection, monitoring and control system managed by the DSO, and new components to control remotely the users' power plants according to centralized strategies (e.g., technical constraints of the power system). The Smart Distribution System of A.S.SE.M. S.p.A. developed in compliance with the most recent hints of the Italian Energy Authority and of the scientific community, is the ideal field test for the integration of new technologies, tools and products devoted to the better exploitation of Renewable Energy Sources and distribution network infrastructures. This is made possible thanks to the already existing Smart Grid architecture, a flexible platform in which new components (new devices, strategies, logics and control tools) can be integrated easily, but also to the experience and competences acquired in the recent years on the specific topic by the personnel directly involved in the experiment.
Exploitable content	The Cross-functional Modular Platform (CMP) which will be developed under inteGRIDy project, will enable A.S.SE.M. S.p.A. to improve the its distribution network management, also through the exploitation of the resources associated with it (e.g. storage) and with consequent benefits in technical and economic terms.
Approach to exploitation	From the operational point of view, the tools and the results obtained within the project will be shared and made available to the technical staff responsible for managing the distribution network so that they can actually be exploited in the management of the network itself. Through appropriate information/awareness campaigns, A.S.SE.M. S.p.A. users will improve their energy behaviours. The results obtained within the project will also be shared with the Italian energy authority in order to expand their implementation to the political level.
Innovation category	• Services

Preferred commercialisation route (if applicable)	Not applicable
Target users/customers	Tools are developed for the internal use of the System Operator. All users connected to the ASSEM power distribution system will also benefit of the new features introduced by the project.
Value proposition and key benefits of innovation	The tools developed in the project will be used by A.S.SE.M. to improve the operation of its MV network, with technical and economic benefits both for the System Operator and for the final users (e.g. grid configuration optimization). In addition, in the perspective of a disclosure of the dispatching services market, A.S.SE.M. could also take advantage of the ancillary services made available by distributed energy resources and energy storage systems through the platform.
Potential impact on market	In Italy, Distribution System Operators act in a local monopoly regime, therefore each DSO is in charge to manage the MV/LV grid in a given area. The tools developed in the framework of the project will be primarily applied to the A.S.SE.M. network, deploying the new features tested on a few substations/lines in the experiment on the whole MV grid of San Severino Marche. In a second step, agreements could be possibly stipulated with other DSOs, in order to share the knowledge acquired in the experimentation.
IPR Assessment	A.S.SE.M. S.p.A. will not generate any intellectual property on this project, however some tools that will be deployed in the San Severino Marche pilot will constitute intellectual property.
Detail action plan to achieve exploitation approach	The results produced by the tools related to the reconfiguration of the MV distribution network, developed within San Severino Marche Pilot, will be made daily available to the technicians of A.S.SE.M. S.P.A. that directly manage the network itself. Thanks to these results, operators will have additional information and useful suggestions to manage more efficiently the electricity distribution network. Some users connected to the A.S.SE.M. network will be also equipped with a storage system provided by the project partner UNE s.r.l.; these users will have the possibility to access, via the UNE web server, various information relating to the storage system and to the production plant connected to the storage system itself, for example, state of charge of the batteries, production of the photovoltaic system, etc. In this way, users will optimize the consumption management, improving their energy behaviour. ARERA, the Italian regulatory authority, will be informed about the work carried out on the electricity distribution network managed by A.S.SE.M. S.p.A. and about the results obtained. This information could be used by ARERA as a starting point for future national regulations.

Detail the strategies to exploit content	The exploitation of the results of the tools developed within the pilot will facilitate the optimal configuration of ASSEM MV distribution network. The network operators will apply, when appropriate, these results to reconfigure the network itself. As part of the pilot, the monitoring and control of the storage systems (installed by UNE partner at some users connected to the Low Voltage grid already equipped with a photovoltaic system) will also be implemented through an aggregator.
Will other inteGRIDy partner(s) be involved in the exploitation of this contents? If yes, then how?	In order to test the logics to be implemented on the energy storage systems, UNE will be involved in the exploitation.
Any other exploitable result (i.e. another product), which has been recognised as complementary, and thus might be marketed together with the described exploitable result under certain conditions.	No
Business model for the exploitable contents suitable	A.S.SE.M. SpA is a regulated entity, and therefore remunerated through public tariff. Therefore, the marketing of the tools developed within the InteGRIDy project is not envisaged.

Partner	**WVT**
Organisation profile	WATT+VOLT S.A. is one of the biggest Greek Utilities, providing integrated electricity services. The highly experienced and qualified professionals of WATT+VOLT and its systematic investment in research and development of new products and services, account for a rapidly growing and highly innovative electricity provider. In WATT+VOLT, we contribute towards the efficient use and conservation of electricity, the overall reduction of electricity cost and the monitoring of the customers' energy footprint. WATT+VOLT provides electricity to 12,000 households, corporations and businesses in the Greek interconnected grid. Furthermore, the company has been a pioneer in for smart metering in Greece, having installed the first smart meter in 2012.
Value proposition	• Utilising innovative technologies for organisations and the environment • Pioneering technology infrastructure to offer reliable solutions • Offer the most competitive tariffs to customers
Strategic focus areas	• Engage energy users to enable them to adopt a sustainable way of life • Smart home - smart power - smart meters • Rational use and saving of energy by customers, through management of energy resources
How is InteGRIDy relevant to your organisation	WVT is one of the biggest Greek Utilities, so thanks to its experience and availability of information, WVT can contribute in different tasks throughout the duration of the project. The proposed small-scale pilot use case for Greece in Thessaloniki is a set of different type of residential buildings with various costumer profiles, a basketball court of the largest football club of Thessaloniki as well as a multi-storey hotel (Macedonia Palace). All the dwellings are part of WVT's portfolio, already equipped with smart meters, allowing real-time monitoring or energy consumption, and are planned to be further extended with more IoT multi-sensorial infrastructures. WVT's smart meters and CERTHs dynamic simulation monitoring services will be further introduced to the current system. An energy VA/billing system is already available by WVT, to be further extended to allow active negotiation with the end-users triggering participation in DR business models. Thanks to its experience, WVT can contribute to analyse different management strategies in order to validate the new business models proposed within inteGRIDy. Additionally, WVT will provide to around 10 customers a home storage solution of around 5-10KWh, to allow further experimentation.
Exploitable content	WVT is a leading private utility company in Greece. WVT is going to use the integridy project results to build stronger and long-term customer engagement opportunities, to have a dynamic impact on the

	Greek liberalized market, to go large scale for DR using the project's replicability option.
Approach to exploitation	Study the project results and build up cost and/or profit-sharing business models with the end customers. The replicability potential could serve the company acting as an aggregator for the actual future DR market needs.
Innovation category	• Products • Services • Prototypes
Preferred commercialisation route (if applicable)	• Internal product development • Licensing • Joint Venture • Spin off
Target users/customers	*i. End low voltage customers / eligible low voltage customers* *ii. SME's* *iii. Energy engineers /* *iv. Energy Services Companies* *v. Energy Portfolio Management / Consultancy companies*
Value proposition and key benefits of innovation	i. Demand Response demonstration ii. Demand Side Management iii. Peak Demand Shifting in large scale implementation iv. Differential pricing business model potential
Potential impact on market	Value Added Services Product and Services diversity in the current market Brand new energy Business Models Customer engagement and loyalty boost.
IPR Assessment	*Are you generating any new intellectual property on InteGRIDy?*
Detail action plan to achieve exploitation approach	Our target group of exploitation is: 1) Large Industrial Companies: WVT has a large sample of industrial customers providing energy on several industry sections. Actions should take place on these customers demonstrating the inteGRIDy approach. 2) DSO and utilities are another group. WVT is taking part (in some cases as a central speaker as well) in several workshops and conferences for energy in Greece and EU, where DSIO and Utilities are joining. Therefore, the inteGRIDy approach should be communicated forward. 3)There is a huge variety of SME clients. WVT is introducing now over 30 retail stores all over Greece, where the SMEs' are visiting. As a result of the company's value increasing, the inteGRIDy exploitation increases.

Detail the strategies to exploit content	Our target group of exploitation is: 1) Large Industrial Companies: WVT has a large sample of industrial customers providing energy on several industry sections. Actions should take place on these customers demonstrating the inteGRIDy approach. 2) DSO and utilities are another group. WVT is taking part (in some cases as a central speaker as well) in several workshops and conferences for energy in Greece and EU, where DSIO and Utilities are joining. Therefore, the inteGRIDy approach should be communicated forward. 3)There is a huge variety of SME clients. WVT is introducing now over 30 retail stores all over Greece, where the SMEs' are visiting. As a result of the company's value increasing, the inteGRIDy exploitation increases.
Will other inteGRIDy partner(s) be involved in the exploitation of this contents? If yes, then how?	The exploitation of the target group will be carried out individually by WVT for its customers
Any other exploitable result (i.e. another product), which has been recognised as complementary, and thus might be marketed together with the described exploitable result under certain conditions.	Not currently
Business model for the exploitable contents suitable	The business model after workshop and communications with the related parties is suitable for the exploitation strategy specified above. Some alterations might occur during the lifetime of the project.

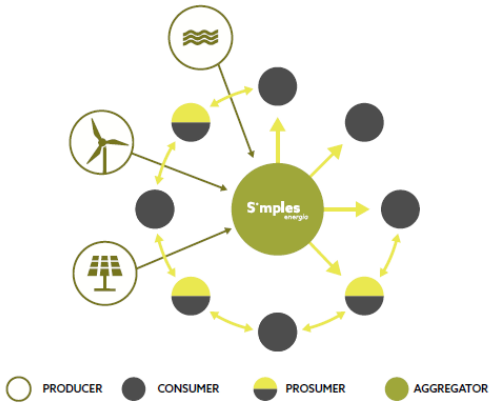
Partner	**ASM**
Organisation profile	ASM Terni is Public Company fully owned by the local municipality (City of Terni). The activity of the company is related to very essential public services in the City of Terni area as: i) Production and distribution of Electric Energy, ii) Management of public street lighting, iii) Environmental Health, iv) Drinkable water distribution and water treatment plant, v) Gas distribution . As DSO, ASM Terni directly owns and operates the power distribution grid and distributes electricity from the MV-LV and HV-MV substations to the end consumers' (65.000 Smart Meters). Over the time, the power grid of ASM has seen the construction of many photovoltaic power plants thanks to the incentives for renewable energy sources (RES).
Value proposition	• Energy distribution system operator
Strategic focus areas	• Smart Grid • Micro-grid • SCADA systems • Grid Optimisation • Smart Meter • Renewable Energy Sources • Gas distribution
How is inteGRIDy relevant to your organisation	TERNI is one of the smartest DSO in Italy and has a significant experience in research initiatives since they are partners in many EU co-funded projects (e.g. FINESCE, ELSA, NOBELGRID). Thanks to the modern SCADA system deployed on the electricity distribution network, TERNI is able to monitor and controlling a real smart grid. This level of smartness is the starting point for the development and testing of a pilot in a rural area close to Terni where an off-grid farm microgrid is being connected to one of the TERNI's distribution substation. In inteGRIDy TERNI will take care of the set-up of the pilot that will allow to test the collaboration between the microgrid and the TERNI's Smart Grid.
What content could be exploited?	ASM TERNI as DSO will make use of the inteGRIDy to improve its Smart Grid in terms of integration and better use of energy resources, especially with respect to microgrids. ASM TERNI will use its network to exploit inteGRIDy results by presenting the developments in professional fairs, technical and scientific journals.
Approach to exploitation	Concrete measures will be planned by ASM TERNI to enhance the innovation capacity and integration of inteGRIDy knowledge. Due to its role as DSO and inteGRIDy test site, ASM TERNI is definitely committed to the inteGRIDy project with respect to the utilisation of the smart grid solutions developed throughout the project. To make effective the ASM's exploitation plan, products have to comply with current legislation and be commercially available. The activities aimed at using and sharing knowledge comprise: i) installation of the new solutions for local microgrids in order to offer DR and other energy services (12-24 months after the end of the project); ii) running the different modules, models, tools and Applications suitable to improve the quality of DSO services (6-12

	months after the end of the project); iii) utilization of the lessons learnt over the project to go beyond the current situation and design new national and European actions (projects, events, training, etc.).
Innovation category	• Services
Preferred commercialisation route (if applicable)	• Not Applicable
Target users/customers	Energy customers/prosumers Urban and rural microgrids
Value proposition and key benefits of innovation	Microgrids offer relevant benefits to electricity systems, especially for the DSO which can use the flexibility given by the microgrid for keeping the distribution network more stable and efficient.
Potential impact on market	Due to a confluence of environmental, social, economic, policy, technology, and capital drivers, the microgrid environment has become attractive to the private sector as new customer of Multi-carrier hub optimization tool
IPR Assessment	No new IPR will be developed directly by ASM TERNI
Detail action plan to achieve exploitation approach	As already described for question 4, the strategy for using and sharing knowledge is as follows: i) installation of the new solutions for local microgrids in order to offer DR and other energy services (12-24 months after the end of the project); ii) running the different modules, models, tools and Applications suitable to improve the quality of DSO services (6-12 months after the end of the project); iii) utilization of the lessons learnt over the project to go beyond the current situation and design new national and European actions (projects, events, training, etc.).
Detail the strategies to exploit content	The content exploitation foresees a wide use of the tools deployed and local microgrid support to increase energy efficiency of the network, as a second step, other similar customer will be involved in the project leveraging on self-consumption maximization, losses reduction, monetary savings and increasing energy awareness. This activity would be carried out by means of proper advices and face-to-face meetings.
Will other inteGRIDy partner(s) be involved in the exploitation of this contents? If yes, then how?	ENG and UNIROMA1 will be partially involved in order to support and further develop the deployed system and create new business models and collaboration, having inteGRIDy solutions as pillars.
Any other exploitable result (i.e. another product), which has been recognised as complementary, and thus might be marketed together	No there is not.

with the described exploitable result under certain conditions.	
Business model for the exploitable contents suitable	Yes, it is.

Partner	**PHE**
Organisation profile	PH Energia, Lda is an electricity retailer company that is aimed to provide market energy solutions to consumer, commercial and industrial applications. It makes use of the experienced and knowledgeable team in the energy sector, in both business and academic field, to develop and integrate both services and products that present a valuable proposal. Through brand *Energia Simples*, PH Energia sells energy in the Portuguese market, residential, business and industrial sectors. With an innovative, digital and straightforward approach to the customer service, based on openness and trust, the company offers one-to-one advice and support to every customer. PH Energia also introduced market indexed tariffs, charging over the daily energy market price a transparent spread, in each month, to the domestic segment. Fully committed to the environment and efficiency PH Energia invests in a push market strategy that looks forward to market micro-production centres using solar energy and technology that monitors and process information, proving efficient, economically and environmentally, in all segments. PH Energia is certified in the ambit of the commercialization of electricity and commercialization, installation and maintenance of photovoltaic solutions(2016/CEP.5217), through the Simple Energy brand and by the Quality Management System NP EN ISO 9001: 2015.
Value proposition	• Experts in energy market solutions • Knowledge of multiple sectors • Bringing innovation to customers • Self-consumption solutions (100% renewable) • Ecological footprint reduction • Market indexed tariffs introduction • Company is 100% digital • Commercialization of electricity in a transparent & simple way • Excellent customer service (products and services tailored to the customer needs and objectives)
Strategic focus areas	• Renewable energy • Energy supply • Self-consumption promotion • Energy efficiency • Environmental sustainability • Innovation & Quality
inteGRIDy's relevance to PHE's current business model	One of the main goals of the inteGRIDy project is a facilitation of the decarbonization of the electricity grid and the integration of large shares of distributed renewable generation, through the deployment of innovative and highly efficient Demand Response, Energy Storage, EV management and SG technologies. PHE has years of established operation in several projects of clean energy production trough solar panels in many hotels, public and industrial buildings. Thus, the inteGRIDy project would enable PH Energia to make use of their expertise in designing and planning an

	optimized offer to each customer and implementing the most efficient solution.
Exploitable content	As the electricity supplier, PH Energia being aware of the legislation in force in Portugal, will contribute with its knowledge in the area for the implementation of the pilot in Lisbon, particularly in case studies that will study the dynamic tariffs, and also contribute to the sizing and the technical installation of the solar plant to be installed on the roof of the building. The participation of PH Energia in the inteGRIDy project would permit to expand the company's knowledge on the new services and technologies proposed in the countries of the pilot projects. Many use cases proposed in different pilot projects can be replicable to more countries across the inteGRIDy Pilots enabling to enlarge the data in a wider and complex environment.
Approach to exploitation	PHE are contributors for the pilot implementation in Lisbon (Pilot 7), with the support of the other technical partners (E-NOVA, UCP, VPS). In this pilot, a small PV plant (area 50 m^2, output 16 kWp)will be installed on the rooftop. The electric energy generated through this plant, combined with storage solutions, will also enable to reduce the grid load. Since PH Energia has a great experience in clean energy solutions (namely PV), its knowledge can be successfully used in the implementation of the pilot. Making use of know-how PH Energia designs and plan an optimized offer to each customer and seemingly implement the most efficient solution. PH Solar is its brand targeted to the operational intervention of this product that operates with the partners and suppliers of renewable production solutions. In addition to this, the Lisboa pilot will be study the potential to adapt the EV charging cycles with dynamic tariffs, that would replace the already used fixed-tariffs system, avoiding EV charging in peak hours. As an electricity retailer, PH Energia would provide the inputs integrating the virtual dynamic tariffs in the use cases of the pilot.
Innovation category	• Products • Services • Software
Preferred commercialisation route (if applicable)	• Internal product development
Target users/customers	*Domestic, Business and Industrial clients* **In 2018 in terms of the customers:** 72% Business customers 24% Domestic customers 4% Industrial customers **In 2018 in terms of consumption:** 53% Industrial customers 44% Business customers

	3% Domestic customers
Value proposition and key benefits of innovation	**Virtual Power Plant Activity**  Energia Simples offers two types of products to renewable electric power producers that intend to sell electricity under the marketplace. **Product I: Fixed price (PPP)** Energia Simples makes a contract at a fixed hourly base price for a period of 1 (renewable), 2, 5 or 10 years. **Product II: Management of sale in OMIE (Service)** Energia Simples puts the electric energy in the market OMIE and charges a management fee indexed to the volume of electricity.
Potential impact on market	Furthermore, PH Energia stands for our planet sustainability, in our home and our surroundings, promoting solar panels and getting actively involved in smart cities and sustainable energy development. This company is following the path toward 100% renewable energy to deliver to the customers. In Spain, objectives are set on the basis of competitive pricing, service and process optimization. PH Energia aims to offer a differentiated, high-quality service along with a portfolio of services tailored to the needs of each customer segment.
IPR Assessment	It is not foreseen that any new IPR will be developed by PH Energia.
Detail action plan to achieve exploitation approach	Considering the reach experience of PH Energia in the area of Photovoltaic Self-consumption solution provision, we would provide the technical support for the PV power plant installation on the Portuguese Pilot site. There would be studied a potential to adapt the EV charging cycles to dynamic tariffs, that would replace the already used fixed-tariffs system, avoiding EV charging in peak hours. As an electricity retailer, PH Energia would provide the inputs integrating the virtual dynamic tariffs in the use cases of the pilot. To achieve this, PH Energia would conduct the detailed studies on the viability of the indexed tariffs for the pilot, taking into consideration the energy spot market price, the building consumption pattern and the availability of Demand Response provision.

Detail the strategies to exploit content	The strategy of the PH Energia in the inteGRIDy project is mainly to prove the economic feasibility of the OMIE indexed electricity tariffs and the feasibility of the PV self-consumption power plant installation.
Will other inteGRIDy partner(s) be involved in the exploitation of this contents? If yes, then how?	The work of PH Energia is tightly connected with all the Portuguese partners: ENOVA, UCP and VPS. As a pilot leader, ENOVA would provide in course of the projects all the necessary technical information about the building in order to facilitate our analysis on the indexed tariffs feasibility. The VPS, as the technological partner and the holder of KISENSE, would provide us by the data of the EVs and ice tanks consumption data, that would be vital for our analysis conduction. The UCP, that is responsible for the Business Models development would help us to develop the Business Model for the Portuguese Pilot. PH Energia, in its turn, would be responsible for the Replication Plan creation.
Any other exploitable result (i.e. another product), which has been recognised as complementary, and thus might be marketed together with the described exploitable result under certain conditions.	No
Business model for the exploitable contents	Yes, completely.

Partner	**EAC**
Organisation profile	Electricity Authority of Cyprus (EAC) is the incumbent power utility in Cyprus, following public body governance rules. Even after the gradual opening of the market, according to EU market regulations, EAC is responsible for almost all conventional power production, owner of the Transmission System (which is operated by TSO (Transmission System Operator)), owner and operator of the distribution system. So far, it is the only power supplier in Cyprus. Currently, it employs approximately 2200 employees, out of which around 200 are scientists and engineers, focusing their activities on the operation, on the maintenance and on the development of the power system. At present EAC operates three thermal power stations with a total installed capacity of 1478MWe. All stations use heavy fuel oil for the steam plant and gasoil for the gas turbine plant. The penetration of RES technologies and other alternative ways of energy to the island energy system is of particular interest to the EAC. Also, other topics such as energy systems economics, energy systems efficiency, electric load forecasting, power system stability, emissions inventories and carbon tax are of particular interest as well. EAC has participated in various FP7 European project acting as a Coordinator and/or as a work package leader (http://www.eac.com.cy/GR/Pages/ResearchandDevelopment.aspx)
Value proposition	• Expertise in power generation, transmission system operation and distribution system operation.
Strategic focus areas	• Micro-grid • smart meters • PLC or GPRS communication technologies • Demand-side management • Renewable energy • Distributed generation • Energy storage
How is InteGRIDy relevant to your organisation	EAC is convinced for the shift to green energy and sustainability, as well as transformation to Smart Grids, and is moving forward to contribute to this end through coordinated projects. To mention some, EAC is conducting a pilot AMI (Automated Metering Infrastructure) project with 3000 consumers, to identify the best practices for smart grid evolution. Further, EAC is also participating in "Smart net metering for promotion and cost-efficient grid-integration of PV technology in Cyprus" project with the Acronym SmartPV, which is co-financed by the European Commission under the LIFE+ Programme (www.smartpvproject.eu). This is a pilot demonstration project approved under the theme “Environment Policy and Governance” contributing to the implementation of European environmental policy and the development of innovative policy ideas, technologies, methods and instruments.
What content could be exploited?	UCY as a pioneer in the research field will utilize the cross-functional platform provided within inteGRIDy in order to increase the energy efficiency within the university campus. By activating the identified

	control points within the campus, the microgrid concept will be implemented. The target is to transform the University of Cyprus into a "living laboratory", which will use its own RES production in order to cover the electricity needs. EAC (as DSO) will take advantage of the controllable microgrid and the controllable prosumers within Cyprus in order to solve grid issues (such as violations of the voltage profile, grid congestion issues, power quality deterioration, etc.).
Approach to exploitation	The cross-functional platform of inteGRIDy will be utilized in order to combine all the information provided by the smart metering infrastructure (for RES production, energy storage and energy consumption) and installed sensor systems within the university campus microgrid with the forecasted energy. The target is to increase the controllability of the microgrid in order to increase the efficiency in the energy flows. The platform provided by inteGRIDy will be utilized by the dispersed prosumers in order to offer ancillary services to the DSO through the controllable demand response. EAC (as DSO) will use the controllability of both the microgrid and the dispersed prosumers in order to resolve the above referred grid issues.
Innovation category	Services
Preferred commercialisation route (if applicable)	Not applicable.
Target users/customers	Prosumers and prosumagers that will be contracted with an aggregator or supplier to provide demand response in an explicit manner by controlled dispatch of their energy resources.
Value proposition and key benefits of innovation	Provide a demand response tool to enable flexibility acquisition-aggregation-optimization-disaggregation-demand adaptation by control. This tool will support aggregators and suppliers to effectively shape their demand response portfolios optimally, and on the other side offer an attractive contract to the users that seek the minimization of their energy bill.
Potential impact on market	Explicit demand response is not currently available for residential prosumers/prosumagers, and if offered, may trigger the development of other related services. However, it may require new regulation.
IPR Assessment	Are you generating any new intellectual property on InteGRIDy? No.
Detail action plan to achieve exploitation approach	

Detail the strategies to exploit content	
Will other inteGRIDy partner(s) be involved in the exploitation of this contents? If yes, then how?	
Any other exploitable result (i.e. another product), which has been recognised as complementary, and thus might be marketed together with the described exploitable result under certain conditions.	
Business model for the exploitable contents suitable	

Small and Medium Enterprises

Partner	**VPS**
Organisation profile	Virtual Power Solutions, S.A. is an innovative, market leader in the design and operation of dynamic connected platforms, providing real-time granular data to consumers, network operators and utilities. Minimising consumption by increasing energy efficiency, optimising the time of use and realising the monetisation of loads. With over 10 years of experience, VPS has a proven team of experts with a strong track record in providing significant benefits to all stakeholders in the modern energy network. Our aim is to become the largest builder and operator of Virtual Power Plants in Europe. Virtual Power Solutions (VPS) is an innovative company with a strong knowledge and experience in: • Internet of Things (IoT), • developing hardware and software solutions, • M2M communication platforms based on cloud and mobile applications for Smart Homes and Smart Cities, • acquiring and processing millions of data every day to provide its customers with valuable information from its data centre to all-over the world. Through its affiliate company in Portugal, VPS has a successfully installed more than 50,000 monitoring points (in banks, hotels, industry, airports, hospitals, universities, retail, utilities and municipalities) across 5 continents.
Value proposition	• Using ICT for an intelligent combination of load management, storage and demand • Innovation in telemetry, remote management and data processing
Strategic focus areas	• Developing and investing in innovative and high-growth solutions in the energy field • Innovation through market / technology analysis, product management in collaboration / partnership and new business acceleration • Deployment of Virtual Power plants • Development of innovative energy flexibility services • Development of smart cities solutions • Development of energy communities
How is inteGRIDy relevant to your organisation	InteGRIDy is relevant in a number of ways since it demonstrates the deployment of products like demand flexibility management and virtual power plant optimisation, which are core to Virtual Power Solutions' strategic interests. The system provides on-line data of electrical consumption in a 15 minutes period. In terms of operation, there is local data collection equipment in each location which collects the information and sends it to the central server using whenever possible the existing network infrastructure. The central system has the ability to receive, consolidate and centrally store the

	information collected from various locations, as well as the ability to provide access to data via web browser. As an industrial partner, VPS will supply energy managing solutions and will develop, deploy and improve DR tools and algorithms for energy usage optimization. VPS will be strongly connected to the Lisbon pilot, by providing the technology for EV charging optimization and PV production monitoring. VPS will be active in system integration and evaluation, and will also participate in dissemination, replication and exploitation activities.
What content could be exploited?	VPS will exploit new demand response tool and algorithms for energy usage optimization.
Approach to exploitation	Participation in InteGRIDy project will be key to improve interoperability with third party systems, which will reduce future implementation costs and enhance market access of proposed VPS solutions. Additionally, VPS will leverage on existent distribution channels (VPS as an established network of partnerships in EU and Latin America from business in the past 10 years providing oil&gas telemetry products).
Innovation category	• Products • Services • Software
Preferred commercialisation route (if applicable)	• Internal product development • Licensing
Target users/customers	(1) Energy retailers and aggregators (2) Large energy consumers
Value proposition and key benefits of innovation	By selling the SW and the HW to retailers and aggregators, or services to large energy consumers, our solution will enable them to optimize flexibility and energy assets. (1) Energy retailers and aggregators will be able to deliver new added value services like Energy Efficiency, Resource Management and others. Direct savings for retailer and aggregator will come from: a. minimizing the imbalance between the electricity purchased/sold and actual consumption/production with distributed resource management; b. enhancing the use of local renewables within their clients' communities and reduce the network fees costs and reduce financing costs. (2) Large energy consumers with many facilities like for instance banks, will be able reduce their energy costs and have

	leverage to negotiate better energy contracts with energy retailers.
Potential impact on market	According to Navigant Research there will be a significant increase of revenues for these services because of the on-going Energy Transition challenges, namely increase of renewables and changes of the end-user role.
IPR Assessment	We own copyrights over kisense technology and evaluate other potential IP outcomes.
Detail action plan to achieve exploitation approach	VPS' action plan to achieve exploitation approach described will start by identifying opportunities within existing customer base in order to add more value coming from project results to the current services provided and later identify further opportunities within VPS' partner channels across several geographies in EU and America.
Detail the strategies to exploit content	VPS is demonstrating their energy managing solutions and improving DR tools and algorithms for energy usage optimization. To exploit this content VPS will use the optimization results to showcase the full potential of its tools. Additionally, will implement in its product range efficiency procedures that will leverage on the interoperability knowledge developed in the project.
Will other inteGRIDy partner(s) be involved in the exploitation of this contents? If yes, then how?	At this stage is not yet identified future commercial partnerships. Nevertheless, if the opportunity presents itself, VPS will be happy to work in partnership with project partners.
Any other exploitable result (i.e. another product), which has been recognised as complementary, and thus might be marketed together with the described exploitable result under certain conditions.	The identified exploitation results are quite wide-ranging and include already all envisioned outcomes.
Business model for the exploitable contents suitable	Yes

Partner	**SUNLIGHT**
Organisation profile	SYSTEMS SUNLIGHT S.A. has a long-lasting and successful worldwide presence in the energy storage and power supply sectors. It has operated in the market for three decades and ranks among the world's top manufacturers of energy products and systems, being specialized in design, production and distribution of: • Energy Storage Systems for industrial, consumer and advanced applications (motive/traction batteries, stand by batteries, torpedo and submarine batteries etc.) • Energy Power Systems (generating sets, UPS, DC power systems, industrial air-conditioning) • Green Energy Systems (autonomous and grid connected photovoltaic systems, energy saving solutions) • Energy-related services (consulting, technical support, spare marts, site survey, installation, commissioning, maintenance, training, recycling, rental/leasing services)
Value proposition	• customized turn-key solutions that cover the high demand energy needs of various sectors • wide range of products and services to meet energy sector requirements
Strategic focus areas	• Extending autonomous entrepreneurial presence Internationally, as well as expanding sales and partners networks • Definition of business models for future energy storage potential
How is inteGRIDy relevant to your organisation	SUNLIGHT will provide its industrial Renewable Energy park at Xanthi, Greece where an islanded RES-powered autonomous grid operates with battery and hydrogen storage in order to improve the energy and resources efficiency. The existing control and automation infrastructure will be extended to allow DR mechanisms to be locally applied and to improve the distribution of the energy among the nodes of the grid using smart and enhanced Energy Management Strategies and Model Predictive Control methods. Also, part of its fleet of MHE EVs will be integrated to the islanded grid to provide a case where dynamically changing charging requirements are necessary, at the factory operated 24/7 having 3 shifts where MHE EVs are used. SUNLIGHT will contribute with its integrated energy storage systems to a number of the project Use Cases, particularly: • Deployment of Energy Management Services to suggest optimal control and automation actions/activities of residential storage solutions using scale-specific experimentally validated models that have been used for the optimization of the operation parameters of places with similar storage requirements.

	• Provide smart integrated home batteries solutions (Li-ion, Lead-Acid etc.), to evaluate their potential use in residential cases.
What content could be exploited?	Mainly, SUNLIGHT will make use of inteGRIDy on Energy Power Systems and Green Energy Systems. Our products may be enhanced with technology that's not SUNLIGHTs specialty at the moment. For example, Artificial Intelligence.
Approach to exploitation	An isolated autonomous grid operates for experimental purposes on Energy Power Systems and Green Energy Systems, at the industrial Renewable Energy park at Xanthi, Greece. The energy sources of the grid are sun, wind and diesel. Lead-acid batteries and Polymer Electrolyte Membrane (PEM) electrolyser that produces, and store hydrogen are used for energy storage. In collaboration with other partners, our focus is to maximize the efficiency of the Energy Power Systems and Green Energy Systems in order to create technologically advanced and competitive products. Furthermore, inteGRIDy gives us the opportunity to learn more about legal, political, technological and economical condition in most of European countries. This knowledge helps us to improve our business and marketing model in European countries and moreover, to understand better the needs of our customers.
Innovation category	• Products • Software
Preferred commercialisation route (if applicable)	• Internal product development
Target users/customers	The main target users are, • isolated communities like small islands not connected to mainland's grid, • refugee camps, • remote telecommunication facilities and • scientific outposts.
Value proposition and key benefits of innovation	Our focus is to maximize the efficiency of the Energy Power Systems and Green Energy Systems. The deployed tools provide online information about the status of the sources and the power demand and also provide integrated solutions for online optimum decision making for the distribution of energy for isolated smart grids with an option of charging batteries for EVs. • Increase the controllability of the energy production, consumption and storage • Optimize the energy distribution in the grid • Provide tools for optimized management of the network

Potential impact on market	We are promoting the use of hybrid systems that are using more than three energy sources and storage solutions. Efficiency results from the intelligent use of existing systems.
IPR Assessment	*No*
Detail action plan to achieve exploitation approach	*Knowledge-sharing/Intellectual activities:* Starting from M27 and on, and as the development activities progress, appropriate scientific material will become available for preparing and submitting articles for publication to journals or for presenting them in suitable conferences. The tools developed by both CERTH Institutes will be available to tailored online repositories, for example GitLab. *Research activities:* While expanding and adjusting the Intelligent Building Control Flexibility and Forecasting tool within the inteGRIDy framework, several forecasting techniques (e.g. PV electricity production from PV panels and load forecasting) have been examined and they will be exploited by implementing them during the course of other scientific programs that are about to begin, after they have been in turn adjusted accordingly to suit the requirements of those projects. Regarding the Building Occupancy and Energy Consumption simulation tool, a clustering method has been implemented, i.e. a variant of k-means in particular, that is currently about to utilized along with some further refinements in another scientific project, more specific e-Dream. Within on-running H2020 projects, such models have been transposed to open-access software platforms (e.g. Open Modelica), while have been populated with more features, offering additional competencies to the end-user *Business activities:* At the moment of writing, Clean Energy Ltd. , for the scope of inteGRIDy, new house-built components representing the dynamic operation of main grid assets (e.g. heat pump, PV, MPPT algorithm for the PV panels controlling system) have been developed by CERTH/CPERI for the APROS Transient process tool, in order to accommodate the needs of the pilots, where this will be used, i.e. the Barcelona and Cyprus sites. In addition, new house-built power production forecasting modules have been developed and integrated onto the commercial platform, through coding, not previously existing in the commercial platform; thus, increasing its interoperability and competencies offered with/to other ones. However, in the course of inteGRIDy these tools have been translated into open-access Python based algorithm, offering thus additional interoperability features, as they can be linked to any type of platform.
Detail the strategies to exploit content	In the Thessaloniki pilot, via the collaboration with the other partners, such as WVT and SUNLIGHT (already consortium members) CERTH will be able to find potential customers, such as other utility providers for example, in order to exploit its assets. For instance, via the inteGRIDy framework will be able to develop software and services suitable for any utility provider, active in domestic market or

	abroad. Additionally, through the SmartHome platform, which serves as a powerful diffusion channel for CERTH, other potential entities, or customers might be attracted to the services provided by CERTH, such as Distribution System Operators, consumers, or prosumers, in order to fulfil their requirements, by using especially the visualization tools developed by CERTH.
Will other inteGRIDy partner(s) be involved in the exploitation of this contents? If yes, then how?	Since those tools will be deployed in Thessaloniki Pilot, where Watt+Volt and SUNLIGHT are also engaged, (already consortium members, both of them), they are both going to be involved in the exploitation of the tools developed by CERTH. Watt+Volt, as a utility provider could promote the use of the tools developed by CERTH. Within the framework of inteGRIDy the Visual Analytics Tool for Flexibility Analysis, Aggregation and Forecasting will include an Aggregator's web application and a mobile application for the end-users/consumers, which will be costumers of the former. Thus, Watt+Volt could participate in promoting the services of this tool to its own customer portfolio for Demand Response programs. SUNLIGHT, as a Battery Energy Storage System designer, integrator and manufacturer, will play a key role in promoting the set-up as a whole that is going to be developed within the inteGRIDy project and will incorporate equipment procured by SUNLIGHT itself and software tools developed by CERTH.
Any other exploitable result (i.e. another product), which has been recognised as complementary, and thus might be marketed together with the described exploitable result under certain conditions.	Various tool components, mainly from the Intelligent Building Control Flexibility and Forecasting tool, developed during the project have been integrated in CERTH's SmartHome innovation-hub. More specifically, the Battery Energy Storage System (BESS) optimization engine, responsible for generating a BESS optimized day-ahead schedule; the forecasting tool responsible for generating a load forecast and finally a monitoring tool responsible for applying the BESS optimized day-ahead schedule in real-time. More can be found at the following link: (https://smarthome.iti.gr/)
Business model for the exploitable contents suitable	The Thessaloniki Pilot is titled: "Flexible DR at Residential and Tertiary Building with Local Storage" with a business model that has the following value proposition: "Our DSM Solution aims at aiding primarily the facility managers of commercial buildings who want to obtain energy costs savings by reducing the electricity bill." Thus, the business model directly at the heart of the exploitation strategy for this pilot.

Partner	**M7**
Organisation profile	Working with housing associations, developers and innovators, Minus7 offers the first building-integrated hybrid heating solution specifically designed for the UK climate. British engineered and BBA approved, the Minus7 System utilizes the best of solar thermal, photovoltaic, heat pump and energy storage technology in one appealingly simple solution. The system works in 3 parts – a roof, solar energy processor which includes a heat pump and thermal stores. All the domestic hot water and heating a building requires is available on demand giving a complete stand-alone heating solution.
Value proposition	• The provision of low-cost low carbon heating – at lower prices than current gas prices for heating and grid prices for electricity • In the UK market our system raises a building's EPC rating by about 25 points. Thus, for buildings rated in bands E/F, our technology raises the buildings to band C. We are cheapest technology per band point. The government is regulating the rental market such that all rental properties have to be at least band C by 2020. • The technology is funded by both the UK governments' heat (RHI) and electricity (FiT) subsidy. This means that the capital cost of the install is paid for by the subsidy.
Strategic focus areas	• Residential and Domestic electricity and heating market
How is inteGRIDy relevant to your organisation	inteGRIDy is relevant in a number of ways since it demonstrates the deployment of products like distributed smart grid storage (used to shift peak load) which is core to Minus 7's strategic interests. If the Minus 7 system was deployed in a million homes it would cost less than £16bn and would remove 3.7GWe from the national grid at peak, while adding 3GWe of PV energy. It would also provide over 3GWth of thermal and electrical storage allowing demand to be moved to match times of low-cost electricity production. Energy stores at this scale solves the problem of intermittent renewable energy generation, while also negating the need for back-up fossil fuel power - thus reducing the overall cost of electricity to the country. The inteGRIDy project aims to provide an evidence base for this concept, building a micro test installation of the system to illustrate the ability to remove peak load form the grid and absorb surplus energy in the thermal stores. Importantly inteGRIDy will enable M7 to articulate the value proposition of DSM. Currently we do not include the economic value of DSM in our business case analysis
What content could be exploited?	• inteGRIDy is enabling M7 to write the interface and control strategy to control a network of heat pumps to provide a DSM service and optimise the purchase of grid electricity

	• The economic value is in the ability to provide the technology with a lower cost electricity tariff. • This capability adds a further level of functionality on the existing product and extends the competitive edge • Benefits of DSM in enabling lower cost energy purchase is will be valuable
Approach to exploitation	The benefits articulated above will be included as part of M7's general exploitation strategy into chosen markets. The network built up through the inteGRIDy project itself will also act as a potential route to market. As the benefits are demonstrated so other partners may choose to exploit the technology.
Innovation category	• Products • Services
Preferred commercialisation route (if applicable)	Internal product development and exploitation. We will initially sell the service ourselves. But our ideal exploitation route is to partner with an energy retailer.
Target users/customers	Initially end user customers are likely to be social housing and build to let clients. The eventual aim is to sell the 'energy as a service' service to all both commercial and residential customers.
Value proposition and key benefits of innovation	Low cost energy combined with demand response revenues - i.e. the ability to exploit variable electricity prices.
Potential impact on market	The concept of energy as a service has a profound impact on the market. Minus7 is an enabling technology and is potentially one of a number of solutions that can support this market. We intend to be first there.
IPR Assessment	Yes – the remote control of heat pumps combined with thermal energy storage has a patent application pending. Its development is part of the inteGRIDy project.
Detail action plan to achieve exploitation approach	M7 is seeking trial installations with our new configuration. We are working with social housing developers in Scotland and Wales where there is considerable governmental push for low carbon properties. The idea is to trial the system in 4 to 10 properties in 2019/20 and roll out to the remainder of the country in 2021 through social housing
Detail the strategies to exploit content	The product we are selling is a system that generates the lowest cost of energy generation on the market. We are likely to be going to market with an 'Energy-as-a-service' model in which the system is provided for a very low cost in return for an energy sale contract.
Will other inteGRIDy partner(s) be involved in the exploitation of this contents? If yes, then how?	Not sure at this stage.
Any other exploitable result (i.e. another	We will be evaluating the InteGRIDy product set as we develop our solution. It would be great if we could use some of the InteGRIDy IP.

product), which has been recognised as complementary, and thus might be marketed together with the described exploitable result under certain conditions.	However, we are concerned about the state commercialisation of many of the products – i.e. The definition of 'product' Sales price Support and updates As many are sold by organisations who are not commercial software providers.
Business model for the exploitable contents suitable	We have contributed to T3.4. We are unclear at this stage.

Partner	**UNE**
Organisation profile	UNE is an Italian SME located in Reggio Emilia and created in 2011. The company provides services and competences in the field of renewable energy and environmental sustainability. UNE supplies hybrid thermal and PV plants as well as micro-wind turbines. UNE is a high innovative company with strong collaboration with Universities and Research Centres. The main mission since 2013 is the development of an innovative Renewable Energy Storage System (RESS) designed and optimized for residential buildings.
Value proposition	• Expertise in provision of services and competences in the field of renewable energy and environmental sustainability.
Strategic focus areas	• Hybrid thermal and PV plants • Energy storage solution for residential buildings • Energy management system • Demand response platform
How is inteGRIDy relevant to your organisation	The ZHERO technology is a storage solution for residential buildings or other low voltage users as public offices or schools. This storage system and its advanced control can be integrated as smart grid component on the final user – low voltage grid side to increase the self-consumption of renewable energy, reducing their possible impact on the grid, and allowing a smart management of the grid both for commercial and technical aspects through the communication with demand response platforms. The device is particularly environmentally friendly, ensuring 100% recyclability. During the inteGRIDy project, UNE will test its storage equipment in real field in the pilot case application to complete the smart grid on the final side strictly connected with the demand response system.
What content could be exploited?	UNE intends to exploit inteGRIDy results to cope with new market demands and to further develop the OWNER GRID (smart grid) network. In particular a) UNE will use the results to improve the ZHERO technology in the context of network services b) UNE is also looking forward to exploiting the predictive algorithms which will be developed within the project
Approach to exploitation	This storage system and its advanced control can be integrated as smart grid component on the final user – the base concept is taking advantage of the “supplementary energy sharing” between users, contributing to reducing the use of the distributor's network (smart grid management). UNE in particular: a) will study the results of the project to provide the customized services required by the network by refining the distribution algorithms, thus increasing system efficiency b) With predictive algorithms, will develop a more refined AI to increase energy self-consumption and to improve the smart management of the energy reserve always available to the

	customer; associating the results with domestics, the energy available to the user will increase in the critical phases.
Innovation category	• Products • Services • Software
Preferred commercialisation route (if applicable)	Joint Venture
Target users/customers	Private customers (private homes) and SMEs
Value proposition and key benefits of innovation	100% recyclable battery, green, high safety, long life expectancy
Potential impact on market	Strong impact on the market
IPR Assessment	*NO new IPR*
Detail action plan to achieve exploitation approach	Through InteGRIDy functions (F1,F2,F3), remote control to manage setpoint and the webserver visualization, it will be possible to manage different Zhero systems sharing and contributing to reducing the use of the distributor's network DSO (smart grid management).
Detail the strategies to exploit content	Thanks to remote control and inteGRIDy data, users will able to check and visualize results on their smartphone, in order to manage costs, benefits, etc. Not only users but also the DSO will be able to communicate with on-filed Zhero's in order to obtain results and calculate various energy sharing algorithms.
Will other inteGRIDy partner(s) be involved in the exploitation of this contents? If yes, then how?	Maybe yes, for example to study new algorithms in order to personalize energy sharing with DSO.
Any other exploitable result (i.e. another product), which has been recognised as complementary, and thus might be marketed together with the described exploitable result under certain conditions.	At the moment it is not expected.

Business model for the exploitable contents suitable	Business Model is still working in progress

Partner	**TREK**
Organisation profile	TREK is a consultancy and technology development services firm, providing Information Technology (IT) services to small, medium and large Organizations all across Europe, North Africa and the Middle East. TREK aims at providing flexible solutions for small and medium-sized electricity consumers and integrated solutions for electric utilities and service providers in the field of demand management (Aggregators).The business strategy of TREK (deployed also through the subsidiary companies belonging to the TREK Group of Companies) includes research and development of advanced technologies, to create a full suite of solutions and products appealing to everyone involved in the electricity market, namely: • Solutions for consumers: Tools for creating consumption profiles (Consumer Profiling), Tools for personalized billing reports (Informative Billing) and Innovative Solutions for Building Automation. • Solutions for Public Agencies and Business / Industrial Consumers: Multiparametric solutions to optimize energy consumption without compromising business performance targets (Entertprise Performance and Sustainability), Tools for the analysis and real-time monitoring of power consumption data (Billing Analysis, Monitoring and Optimization), along with energy consumption forecasting and reporting tools. • Solutions for Utilities and Energy Services Companies: Tools for analysing Consumers' Portfolios and shaping optimized billing strategies, Innovative Solutions for Forecasting and Management of Electricity Demand, Tools for Electricity Trading Optimization and Risk Management and cutting-edge solutions for ensuring semantic interoperability between infrastructure / devices / systems of smart grid, adopting the approach of the Internet of Things (Cloud and Standards-Based Services - "Internet of the Grid"). TREK focuses on designing and developing innovative techniques and solutions for analysis of consumer profiles, as well as, the development of intelligent and automated techniques for real-time balancing of supply and demand of electricity (power optimization balance), while overcoming critical factors that prevent widespread adoption and implementation of demand response strategies (Demand Response - DR).
Value proposition	• Expertise in providing flexible solutions for small and medium-sized electricity consumers and integrated solutions for electric utilities and service providers in the field of demand management (Aggregators). The main focus of the company is to provide innovative tools that enable a better understanding of demand, unleashing that way the potential of flexibility of consumers to participate in DR campaigns. The company provides both consultancy services and the platform for DSM participation.

Strategic focus areas	• Smart Grid Solutions • Energy efficiency and DR schemas • Energy Management Solutions • IT management solution
How is inteGRIDy relevant to your organisation	With respect to the inteGRIDy project, the business strategy of TREK includes research and development of advanced technologies, to create a full suite of solutions and products for the design and implementation of effective demand response strategies. More specifically, TREK has developed an innovative user profiling framework which utilizes real-time energy demand data and ambient information in order to define dynamic consumer flexibility profiles and optimize the demand response potential of individual consumers and (subsequently) aggregated clusters of them. These demand flexibility models allow for the quantification, in real time, of the discomfort caused by the reduction or shifting of specific loads. Subsequently, this is translated into dynamic demand flexibility functions that feed demand side control and optimization strategies. By quantifying the discomfort levels of customers, we enable the identification of personalized Value of Lost Load (VLL) models, which eventually are transformed into local and global Demand Flexibility models. These models can further enable the delivery of robust short-term forecasting of demand flexibility along with quantification of the cost of demand reduction or shifting, promoting that way the implementation of successful DR campaigns. Moreover, TREK aims to develop a novel Visual Analytics framework (interface for Utilities and Aggregators) that allow for the multi-criteria clustering of the demand side, considering not only consumption information but, also, additional information (geographic, demographic, along with behavioural ones under various conditions), thus allowing for accurate and optimized segmentation of the demand side. This is a data analytics platform with enriched visualization to facilitate the business stakeholders (especially DR Aggregators) in portfolio management.
What content could be exploited?	By defining TREK developments performed in the inteGRIDy project, we proceed with the definition of the 1st version of the exploitation plan. Development of a **context-based profiling flexibility engine** to further extract in an automated way the potential of flexibility/controllability of portfolio customers. By taking into account in-building contextual (environmental conditions) and operational (devices operation) conditions, we proceed with the establishment of an analytics engine that enables the extraction of accurate consumers profiles and further selection of best fitted **automated Demand Response Strategies.** The main objective is to extend the list of functionalities provided by the Demand Side Profiling Engine (TREK tool) and more specifically: • Inclusion of building thermal mass modelling techniques

	• Incorporation of virtual energy storage concept as part of the functionality supported by the tool. The latest will enable the implementation of demand shifting strategies • Incorporation of additional load (device) models • Adaptation of fine-grained control techniques as part of the functionality at the DSS layer of the engine A **Data Analytics tool** as a service of Aggregator cockpit, enabling process analytics and simulation analysis over historical data of consumers. The **Visualization Analytics tool** is also a tangible outcome that TREK will try to commercialize as part of the software solutions of the company in the energy domain. TREK's main objective is to exploit the Visualization Analytics tool to be developed in inteGRIDy project, by providing customized Demand Side management services. More specifically: • Apart from typical energy analytics, one of the main objectives of the Data Analytics is to provide analytics over Demand Side Management Scenarios. Therefore, the business layer of the tool is able to address innovative business models for the new energy market stakeholders. • Toward the provision of enhanced analytics, several data types are defined and further incorporated in the holistic Visualization framework (energy consumption data, flexibility profiling data, environmental conditions, price data etc…). The main innovation of the proposed engine is that we decouple data management from analytics layer, facilitating that way the easy integration with heterogeneous data sources. • An add-on feature of the Visualization Analytics framework is the "what if" simulation analysis feature. The role of this module is to support energy market stakeholders (namely Aggregators and ESCOs) to perform simulations about portfolio performance under different business conditions. Special focus is delivered on the simulation of different Demand Response Strategies towards the optimal selection of clusters of consumers to participate in different types of business services. We presented above the 2 core exploitable outcomes of the company, directly linked with the development and evaluation activities performed in the project.
Approach to exploitation	As mentioned above, we are defining two potential exploitable assets: • TREK enhanced Demand Side Profiling Engine • TREK Visualization Analytics tool For each of them, an updated exploitation plan is presented. We have to point out that the updated version of the exploitation deliverable will provide a more concrete plan towards the

commercialization of the project outcomes (considering also the demonstration of the frameworks at the different pilot sites).

TREK enhanced Demand Side Profiling Engine

The **Demand Side Profiling Engine** developed in the project provides an enriched functionality useful for different stakeholders. The analytics engine enables the extraction of accurate customer profiles; thus, this process engine can be further integrated to different energy management services for:

- **Facility Managers and ESCOs**: By incorporating the **demand flexibility engine** feature in existing energy management tools, we offer fine grained calculation of the potential of demand flexibility, facilitating that way the implementation of control strategies (automated or not) associated with the energy management contracts.
- **Microgrid Operators**: as the responsible party for energy management of a mixed (demand and generation) portfolio. The **demand flexibility engine** enables a better management of the demand side, supporting that way the optimal management of the microgrid operation.
- **Demand Response Aggregators**: This is the main business case examined in the project. By incorporating **demand flexibility engine** in existing portfolio management tools, we provide a more accurate estimation of flexibility potential, towards triggering successful business (Demand Response) strategies.
- **BMS solution providers companies**: The **demand flexibility engine** could stand as an add-on feature of existing BMS solution.

It is obvious that the **Demand Side Profiling Engine** can act either as an end-to-end application for energy market stakeholders or as an integrated software module of commercial BMS solutions. Towards this direction, the main path for commercialization of the **Demand Side Profiling Engine** is defined:

- **Demand Side Profiling Engine** as part of TREK energy services pool. TREK is developing end-to-end solutions in the energy field (main focus on the provision of demand side management services) and thus the **Demand Side Profiling Engine** will be incorporated as analytics feature of the energy management solutions.
- Bilateral agreements with BMS service providers towards incorporating the flexibility engine as part of BMS solution. TREK to exploit available contacts in energy markets to promote the respective service.
- Direct contacts with market stakeholders (facility managers, retailers acting as Aggregators, VPP managers) towards promoting the flexibility engine as an add-on feature in the available energy management services. A licensing policy should be defined during the last period of the project period

	towards exploiting the context-based flexibility engine as a software element. The current version of the exploitation plan focuses mainly on the definition of potential customers for the developed services. Details about marketing policies along with the time plan for the commercialization of the **Demand Side Profiling Engine** will be defined in the updated version of the exploitation plan. **<u>TREK Visualization Analytics tool</u>** The tool is considered as an analytics engine to support different market and grid operations and therefore considerable for different stakeholders and portfolio managers. More specifically, the tool with the enriched functionality may provide benefit services to: • **Demand Side Management /DR Aggregator**: this is the case examined in Integrity project. The plan is to provide analytics over DSM services (as presented above), enabling the optimal placement in Demand Response markets. • **VPP/Microgrid Operators**: This is a new term in energy market responsible for the management of a micro level (in geographical terms) portfolio. Data analytics over heterogeneous data types will facilitate the optimal management of the cluster of microgrid customers. (Main focus in optimal production vs. consumption management) • **ESCOs & Facility Managers**: Similar to the VPP Operators, the role of ESCOs and Facility Management companies is to serve their customers by providing meaningful energy management services. Therefore, the Data analytics tool could provide insights towards the implementation of best fitter energy efficiency strategies to their customers. • **Market Retailers:** The responsible market entities to represent consumers in traditional energy markets. The visualization analytics engine could provide insights towards the extraction of clusters with similar characteristics and thus the definition of innovative dynamic tariff policies. • **Energy Consultancy Agencies**: Towards the digitization of electricity grids, the world of energy data science and analytics is continuing to grow. That leads to the growth of consultancy agencies providing analytics over big data. The Data analytics tool (especially the “what if simulation” feature) could be a useful tool for these stakeholders. The current version of the exploitation plan is focusing on the definition of potential customers and possible exploitation channels. The detailed marketing plan for the exploitation of Visualization Analytics tool along with the licensing policy will be defined in the final version of the deliverable, following the demonstration of the software components during the project period.
Innovation category	• Products • Services

	• Software
Preferred commercialisation route (if applicable)	• Internal product development (In this procedure, possible customers of TREK's aforementioned tools (either end-to-end solutions or individual modules) could be used as beta testers in order to acquire valuable feedback as part of the tools optimization/tailoring process) • Assignment of IP to third party • Joint Venture
Target users/customers	As mentioned before, TREK aims to create a full suite of solutions and products appealing to a wide variety of participants within the electricity market such as: Domestic Consumers, Industrial Consumers, Public Agencies, Utilities and Energy Services Companies (e.g. Load Aggregators, VPP Aggregators, Facility Management Agencies and Market Retailers).
Value proposition and key benefits of innovation	TREK's versatile experience and inter-domain expertise is dedicated to the development of flexible solutions towards almost anyone involved within the Energy market. Advanced mathematical, algorithmic and developing expertise is incorporated to achieve high-end solutions in the areas of consumer-profiling, human-centric demand flexibility estimation, optimization of DR campaigns, DR dispatching, advanced analytics and visualization tools. Based on a flexible team of experts, it is possible to develop different combinations of all the aforementioned tools in order to meet the requirements of a wide variety of target groups while ensuring robust and fully supported products and services provided in versatile sales models. Although the above are already reflected in its current product chain, TREK continuously aims to upgrade the provided solutions by exploiting new experiences and know-how acquired through the company's participation in research programs, academic activities and internal research development, thus adding significant value to its commercialized tools.
Potential impact on market	The impact of TREK's activities both in terms of product development and technology provision on the market, can be distinguished in two main directions. The first direction is the market that incorporates products and services aiming to realize cost reduction and energy loss minimization for the shake of residential consumers while preserving their comfort habits through innovative and technologically modern solutions (IoT). This is an already well-established market field, still holding great opportunities for new technology providers. TREK's business plan involves the commercialization of a series of products and services incorporating in-house developed H/W and S/W to achieve significant penetration in the specific market. TREK's combined provisions towards dealing with visual and thermal occupants' comfort while eliminating energy losses or even incorporating Virtual Energy Storage (VES), introduce new market schemes that possibly will attract other technology providers to develop healthy competition in that area. Similar effects are

	anticipated to occur in the relevant Market of Industrial Consumers, where naturally the place of occupants' comfort preservation is taken by the non-compromised business performance targets. The other direction is that of Demand Side Management (DSM), involving all kinds of electricity market participants. Although some countries have already adopted implicit or explicit DR schemes realized by Utilities and Aggregators, DSM is still considered to be an emerging technology area. Most countries are now launching the process of introducing such schemes in their regulatory frameworks thus DSM is evidently considered to be a very fertile ground for business development. TREK has already developed and continuously upgrades a relevant product chain, able to support such already existing Market schemes or to participate in their ignition process where they are not yet introduced.
IPR Assessment	The innovation developed by TREK in the framework of inteGRIDy project is expected to extend the functionality of the company's tools, providing significant added value to current customers while expanding its customer-base. However, within the framework of inteGRIDy, no intellectual property is generated.
Detail action plan to achieve exploitation approach	The presented action plan refers to the exploitation of the two tools developed by TREK within InteGRIDy; the enhanced Demand Side Energy Profiling engine (DSEP), and the Visualization Analytics Engine (VAE). The final target/objective of the action plan is the commercialization of the developed tools, either independently as extra components to existing solutions or as a standalone combo tool. • As a first step, TREK has already identified the potential customers according to the current energy market. Such potential customers can be; Facility Managers and ESCOs, Microgrid Operators, Demand Response Aggregators and BMS solution providers, Market retailers and Energy consulting agencies. • The InteGRIDy results will be demonstrated along with the developed DSEP and VAE engines to the existing customers of TREK that are interested in adopting the DSEP and VAE engines, as an attempt to approach the early adopters who are expected to be the first buyers. • A detailed licence policy will be defined taking into account different licensing model possibilities such as subscriptions or perpetual licensing. The licensing policy to be followed will be a decisive factor in the definition of the pricing policy of the tools. • Considering the TRL level of the services and the need to demonstrate and evaluate system functions the estimated time to market for the combo application (and the allocated services) is 12 months after the end of the project. • In collaboration with other project partners, TREK's marketing efforts will also focus on raising public awareness of the developed tools and the project's outcomes by publishing scientific articles, whitepapers and reports about the tools' functionalities and pilot site activities

	demonstration, participating in conferences and attending high-tech exhibitions and events of the energy related field. • A complete market and competition analysis will be performed during the project in order to identify the best approach for the commercialization of the project outcomes.
Detail the strategies to exploit content	The exploitation strategy presented below aims primarily at the exploitation of the tools developed by TREK within the lifetime of InteGRIDy but also at keeping them running and further refine them as marketable products after the end of the project. This strategy takes into account the available energy market in EU. • Having identified the potential interested stakeholders, TREK will start communications in order to create and populate a customer data base throughout Europe. • The current or potential competition in the market will be identified. The purpose for that is to identify the strengths and weaknesses of the product against its competitors and define the product's unique value proposition. • Having reached the target of a Technology Readiness Level (TRL) 7 (referring to the "system prototype demonstration in operational environment" as defined in the EC guidelines) with the pilot installations created within the inteGRIDy project, TREK will utilize the input received from the pilot users upon completion of the pilot testing to further improve the quality of the tools. • From the newly populated customer data-base and the already existing TREK customers, the early adopters will be identified and approached as potential buyers and beta-testers of the tools. • The user inputs and capital acquired from the first sales will be utilized to further develop and refine the offered tools to achieve a higher TRL. • TREK will attempt to increase the offered service of the developed tools by creating partnerships with ESCOs, aggregators and other interested businesses in order to incorporate the tools as added software components to their already existing portfolios • Synergies will be established with the academic field in order to maintain an up-to-dated perspective of the on-going research and incorporate new technologies that can upgrade and increase the functionality of the developed tools. • As a continuation of the previous point, TREK will publish any further system developments or results of the developed tools in scientific journals or present them in conferences in order to raise • awareness at the scientific community and stay among the technology leaders in the field. • TREK will promote the DSEP and VAE tools through public exposure events such as European forums and international expos.

Will other inteGRIDy partner(s) be involved in the exploitation of this contents? If yes, then how?	SOREA (ex INNED) is the project partner involved at the development of the DSEP and the VAE engines and will also be involved at their exploitation. As a company, SOREA is a utility (DSO & retailer) that will also assume a role as an aggregator within the InteGRIDy project. In this point of view, SOREA offers valuable input during the design phase of the tools by providing insight regarding the required functionalities and as pilot users of the VAE they can also contribute in its development by offering input on how to improve the user experience of the tool. After the design phase of the tool, SOREA can potentially contribute at the co-development process of a marketable product. As a potential customer for the DSEP and the VAE, SOREA is in the position to provide guidance on many levels- including but not limited to market awareness, user experience feedback. Following the steps related to the development of a marketable product, the role of SOREA in the co-development of the two tools would be to enable the formulation of the marketing strategy, including identifying the competitors in the field, help understand the market opportunities and identify existing gaps in the market along with indicating appropriate promotion strategies, commercialization routes, and pricing policies. They can also organize market tests in order to re-design new versions of the product to follow market-trends and customer's requirements. Finally, in the co-design scenario, SOREA can assume responsibilities for the product development and establishment of all ancillary support to product/service (i.e. Planning, Inventory, Orders, Shipping, Pricing/Billing, Tracking) and post launch maintenance and support.
Any other exploitable result (i.e. another product), which has been recognised as complementary, and thus might be marketed together with the described exploitable result under certain conditions.	N/A
Business model for the exploitable contents suitable	The business model defines the potential residential electricity consumers' willingness to reduce their energy cost and have access to information regarding the energy performance of their households. The exploitation strategy aims at promoting two tools, the DSEP and the VAE engine to different businesses including aggregators and facility managers that will use the provided analytics and functionality in order to address the needs of their customers and customize their Demand Response strategies in such a way as to contribute to the reduction of their customers' energy costs. In this way, the exploitation strategy is considered to be driven by the defined **customer segments** and the **provided problem statement**. The **solution** given in the business plan suggests that by applying smart monitoring and control at the residential user premises the desired results can be offered without compromising the customer's comfort.

	This is also in line with the exploitation strategy in the sense that these functionalities are already provided by the developed tools while the exploitation strategy also includes a thorough testing and continuous upgrading process to develop new versions of the tools and address any additional requirements that might be identified in time. The **channels** defined in the business model are partly in line with in exploitation strategy as the energy consumers are not directly addressed and therefore, they can only be informed of the TREK tools indirectly through their energy bills and comfortable indoor conditions which is also aligned with the **value proposition** of the business model. As the exact financial considerations of **cost** and **revenue** have not been included in neither the business model nor the exploitation strategy, they are currently excluded from this document. Finally, regarding the **key metrics** of the business plan, the intention to monitor the consumer engagement through their feedback to the provided app and their energy savings drives the exploitation strategy in the sense that results of the tool application and activities are expected to be published for dissemination and marketing purposes.

Partner	**AIGUASOL**
Organisation profile	Founded in 1999, the SME AIGUASOL team is made up of more than 20 professionals with a high level of technical and scientific experience. They include engineers, PhDs, architects and physicists who have notable experience both in private companies and research centres, and distributed among offices in Barcelona, Basque Country, and Santiago de Chile. AIGUASOL provides engineering and research services, promoting innovative solutions to reduce the impact associated with energy consumption (experience in urban planning, construction, industrial processes and power generation, with a focus on energy planning, savings measures, energy efficiency, process integration and renewable energy implementation). AIGUASOL is the official TRNSYS distributor for Spain and Portugal, and develop energy-advanced tools for third parties. AIGUASOL has participated in several Tasks of the International Energy Agency and is member of the Steering Committee of the ESTTP. AIGUASOL have a wide experience on energetic plans (i.e. the Barcelona energy improvement plan), building thermal and lighting simulations, and renovation proposals definition and validation through cost optimal analysis (i.e. the TOBEEM project introducing a semi-automatic cost optimal analysis for tertiary buildings, for more than 20,000 scenarios). We also have wide experience on monitoring HVAC systems (both, generation but also distribution and emission elements) in order to understand their operation, and to detect improvements (linked to emulation and simulation techniques) both to substitute physical elements (retrofit) and/or to operate the existing or the new ones in the correct way. Those methodologies are linked to BEMS-BEPS integration.
Value proposition	• Expertise in a range of fields including research & development of energy performance and monitoring tools
Strategic focus areas	• Energy in Buildings • District and large energy plants • Energy Policy • Energy Rehabilitation • Energy management systems • NZEB buildings and environmental labels • Energy Intensity in industry • R&D
How is inteGRIDy relevant to your organisation	AIGUASOL, as an engineering and consultancy company working deeply in thermal-electrical simulation for the design of real-life systems, is aware of the important role that energy in building can assume to foster the stability and coordination of distributed energy resources and enabling collaborative storage schemes within an increasing share of renewables. For this reason, it wants to take advantage of the knowledge acquired during the project to incorporate it into its portfolio of services to the industry and tertiary sector.
What content could be exploited?	AIGUASOL will make use of inteGRIDy to enhance its portfolio in smart grid DR programs and strategies. As well, all the thermal-electrical models and control strategies developed will be integrated in the new-

	gen Energy management systems, which are planned to be developed by the company.
Approach to exploitation	Aiguasol aims to play a decisive role in the analysis and implementation of advanced control strategies in the Barcelona pilot case. The participation in these tasks will provide real experience in the implementation and optimization of DR strategies, with the future objective of being replicated in other existing facilities. In addition, its participation in other important work packages, such as WP3 and WP9, will allow to expand it knowledge on the application and exploitation of smart grid DR programs and strategies. Knowledge that will be incorporated in the realization of future local energy master plan or national policies.
Innovation category	• Products: A model of a swimming pool for the calculation and optimisation of the demands • Services: consultancy services for: • Sport centers energy optimisation • Consultancy in demand response strategies for tertiary buildings. • Development of predictive models for energy demand estimation • Prototypes: development of a new adaptive control system for heated swimming pools.
Preferred commercialisation route (if applicable)	• Internal product development: for internal use, design and optimisation of new or existing sport centers. • Consultancy services to ESCOs, municipalities and sport center owners in the energy efficiency optimisations of their facilities.
Target users/customers	*ESCOs, municipalities and sport center owners*
Value proposition and key benefits of innovation	Currently each cooling and heating system has its own control unit and strategy and it's optimised to work independently, but the integration of all the systems, working together, is not optimized. This innovation will optimize the energy efficiency of the whole sport center.
Potential impact on market	Energy efficiency optimisation and energy savings
IPR Assessment	*NO*
Detail action plan to achieve exploitation approach	*Replicate solutions with highest potential of savings in five facilities in the following two years after the finalisation of the inteGRIDy project. This will be performed at facilities that Aiguasol has already implemented in the past energy related actions or equipment.*

Detail the strategies to exploit content	*Improve and expand the scope of the existent energy systems with new energy management system developed in the project. Aiguasol will focus on the tertiary sector and consumers of heat and electricity.*
Will other inteGRIDy partner(s) be involved in the exploitation of this contents? If yes, then how?	*Currently it is not considered, but since we have collaborated with other inteGRIDy partners throughout the project, it is our intention to establish strategic alliances with partners such as Naturgy, Siemens and CERTH.*
Any other exploitable result (i.e. another product), which has been recognised as complementary, and thus might be marketed together with the described exploitable result under certain conditions.	*The acquired knowledge in smart grids will be added to Aiguasol's portfolio and offered as an additional consultancy service.*
Business model for the exploitable contents suitable	*Not Yet*

Research and academic partners

Partner	**UNIROMA1**
Organisation profile	"Sapienza" University, which was founded in 1303 in Rome, is one of the oldest universities in the world and one of the top performer in international university rankings. The research unit involved in the proposal is with the Dept of Astronautics, Electrical and Energetics Engineering of the Civil and Industrial Engineering Faculty. The members of the research unit have an extensive experience in network studies related to planning, design, operation and protection of transmission and distribution networks; as well as in developing of simulation models for static and dynamic studies related to the integration of distributed generation, demand response, storage systems and EV charge systems in smart and micro grids during normal operation and fault conditions.
Value proposition	• Expertise in a range of fields including renewable power generation, LV network , Battery Energy Storage, MV networks analysis.
Strategic focus areas	• Smart Grid • Smart Cities • Smart Microgrid • Building Automation • MV/LV Network Studies
inteGRIDy's relevance to PHE's current business model	UNIROMA1 has developed the network model for the state estimation of the ASM Terni power network, hence it will carry out preliminary lab studies with a view to provide feedback and suggestions on how to optimize micro grid cooperation with secondary substation and ASM Terni DMS. In particular, UNIROMA1, having already implemented and validated (in previous research projects) an accurate model of the ASM Terni MV/LV distribution network, will be immediately able to conduct in-depth studies of the network (power flow, optimal power flow, short circuit analysis, frequency analysis, power quality, hosting capacity and so on) aimed at estimating the response of the system (both in normal operation and during faults) in relation to the interconnection of rural micro-grid. These studies will provide the necessary knowhow for a secure and reliable interconnection of micro-grids to the distribution network, as well as the preliminary investigation tool for their subsequent integration into the DSO's SCADA system, in order to obtain a better management of available energy sources. UNIROMA1 with ENG will develop optimized power network management tailored to utilize LV micro grid as flexibility asset through leveraging on decentralized automation.
Exploitable content	UNIROMA1, as academic partner in the Terni Pilot, will make use of inteGRIDy mainly to: • Improve the knowhow in the field of energy management, distributed generation and distribution network operation

	• Promote the collaboration with distribution system operators, as well as with other partners operating in the energy field
Approach to exploitation	Optimization algorithms for the management of LV micro grid/ MV distribution network will be tested and verified by field measurements in Terni Pilot. UNIROMA1 expects to exploit and disseminate such results by participating to international conferences and by publishing papers in the most relevant international journals in the energy field.
Innovation category	• Services • Software
Preferred commercialisation route (if applicable)	• Consultancy
Target users/customers	Thanks to the knowhow improvements in the fields of energy management, distributed generation and distribution network operation driven within the inteGRIDy project, as well as to the algorithms developed in Terni Pilot, UNIROMA1 expects to provide technical consultations to DSOs and prosumers for integration and management of renewable sources and micro-grids within MV and LV distribution networks.
Value proposition and key benefits of innovation	The key benefit expected is to provide a higher reliability electric service and better power quality to the end customers. Micro-grids can also furnish the local DSO with additional benefits by providing dispatchable power to be used in peak load conditions; moreover, there is a benefit also for the DSO related to the possibility to alleviate or postpone distribution system upgrades.
Potential impact on market	The expected impact is the higher penetration of distributed generation, as well as the integration of micro-grids, in MV and LV distribution networks, thanks to a better control of such resources.
IPR Assessment	NO
Detail action plan to achieve exploitation approach	Algorithms for the management of the flexibility provided by the LV micro grid to the MV distribution network owned by ASM are based on the following models: battery model, CHP model, LV microgrid model and MV grid (up to the interconnection point with the microgrid) model. Such models will be validated by comparison with field measurements executed by ASM in the pilot site and provided to UNIROMA1 during WP 7. The dissemination of results will follow the validation of models and is intended in two different ways: 1) participation to international conferences (UNIROMA1 actually is in the organizing committee of IEEE International Conference on Environment and Electrical Engineering, which is held each year);

	publication in the most relevant open access international journals in the energy field (among which Energies, published by MDPI, seems to be the most suited).
Detail the strategies to exploit content	The know-how, acquired during inteGRIDy, regarding microgrid flexibility and microgrid-DSO cooperation will be used in order to replicate results in other distribution networks. At present, UNIROMA1 strictly cooperates, by means of research contracts, both with other Italian DSOs, such as Acea in Rome and Enel in most of Italy, and electricity traders such as Green Network. inteGRIDy results will allow for a larger cooperation.
Will other inteGRIDy partner(s) be involved in the exploitation of this contents? If yes, then how?	ASM, as leader in Terni Pilot, is directly involved in the exploitation. Another partner involved is ENG, with which UNIROMA1 and ASM closely collaborate in the Pilot. The involvement of ASM and ENG in the exploitation has already begun, since at the 2018 IEEE International Conference on Environment and Electrical Engineering and 2018 IEEE Industrial and Commercial Power Systems Europe (EEEIC / I&CPS Europe) UNIROMA1 presented one paper co-authored with ASM and ENG and one paper co-authored with ASM. The same is expected to happen in the near future with the participation to other international conferences.
Any other exploitable result (i.e. another product), which has been recognised as complementary, and thus might be marketed together with the described exploitable result under certain conditions.	No, there is no other inteGRIDy exploitable result/product which has been recognised as complementary.
Business model for the exploitable contents suitable	The exploitation strategy of UNIROMA1 is not strictly related to the business model developed for the Terni pilot.

Partner	**CERTH**
Organisation profile	The Centre for Research and Technology-Hellas (CERTH) is the only research centre in Northern Greece and one of the largest in the country, founded in 2000. It is supervised by the General Secretariat for Research and Technology (GSRT) of the Greek Ministry of Education and Religious Affairs. CERTH has important scientific and technological achievements in many areas including: Energy, Environment, Industry, Mechatronics, Information & Communication, Transportation & Sustainable Mobility, Health, Agro-biotechnology, Smart farming, Safety & Security, as well as several cross-disciplinary scientific areas. Two different institutes from CERTH participate in the inteGRIDy project, namely the Information Technologies Institute (ITI) and the Chemical Process and Energy Resources Institute (CPERI). *(i) CERTH/ITI* The Information Technologies Institute (ITI) was founded in 1998 as a non-profit organisation under the auspices of the General Secretariat for Research and Technology of Greece, with its head office located in Thessaloniki, Greece. Since 2000 it is a founding member of CERTH, being one of the leading institutions in Greece in the fields of Informatics, Telematics and Telecommunications, with long experience in numerous European and national R&D projects, with more than 350 employees. It is active in a large number of research domains such as Security and Surveillance, Image and Signal Processing, Computer & Cognitive Vision, Human Computer Interaction, Virtual and Augmented Reality, Multimedia, Database and Information Systems and Social Media Analysis. Since its establishment, CERTH/ITI has participated in more than 175 research projects funded by the European Commission (FP5-FP6-FP7 & H2020) and more than 100 research projects funded by Greek National Research Programmes and Consulting Subcontracts with the Private Sector (I&T Industry). ITI currently has 216 employees including Scientific Personnel (Researchers, Collaborating faculty members, Postdoctoral Research Fellows, Postgraduate Research Fellows, and Research Assistants), Administrative and Technical Staff. In the last 10 years, the publication record of ITI includes more than 270 scientific publications in international journals, more than 600 publications in conferences and 100 books and book chapters. These works have been cited in more than 6500 times. *(i) CERTH/CPERI* Chemical Process and Energy Resources Institute (CPERI) was founded in 1985 in Thessaloniki, Greece and in 2000 CPERI became a founding member of CERTH. CPERI is the leading research institute at a national level according to the latest five-year evaluation by an internationally scientific committee assigned by the General Secretariat of Research and Technology with more than 200 employees. CPERI contributes to the increased competitiveness of the Greek and European industry by providing unique and innovative solutions to research problems of technological and/or commercial interest. CPERI is classified among the Institutes of Excellence in Greece, while its inflows are around to EUR 10 million €/year. Moreover, it holds the 16th

	position among the European Research Institutes (top 50 REC organisations) having signed grant agreements in FP7 in terms of counts of participations for the period 2007-2013. CPERI has participated in numerous EU and National projects related to energy field acting as a technology and systems integrator, demonstration case provider, automation systems infrastructure designer and industrial software developer. Two different CERTH/CPERI laboratories are participating in the inteGRIDy project, in particular: - the Laboratory of Process Systems Design and Implementation (PSDI) and - the Institute for Solid Fuels Technology and Applications (ISFTA). The quality of scientific work carried out by CPERI researchers over the last 5 years is documented in 904 publications in reputable journals, conferences, books and 16,270 citations, deriving from 881 research projects that have been implemented during this period. In 2016, total annual turnover of CPERI reached 9,8 million Euro and its personnel amounted 204 persons, while ISFTA contributed with 1,961 million Euro and 55 employees. On March 30, 2012 Chemical Process Engineering Research Institute (CPERI) merged with Institute for Solid Fuels Technology and Applications (ISFTA) to establish the Chemical Process & Energy Resources Institute (CPERI). The new established Research Institute is a member of CERTH, since then. CPERI/ISFTA focuses on the lab/pilot scale demonstration of energy systems dealing mainly with fossil fuels and lately with RES supported by steady and unsteady simulation platforms for their principles of operation representation. The Laboratory of Process Systems Design and Implementation (PSDI) at CERTH has a wide background on the study and construction of process systems and integrated energy systems used for energy production, management and storage and holds unique knowledge in system design, engineering and integration of industrial automation systems, supervisory control and data acquisition systems for industrial processes and advanced optimization techniques.
Value proposition	• High Quality Scientific Research • Deep technology and industry expertise • Strong partnerships with the International & National Industry • Strong collaboration with Research Centres and Universities in Greece and abroad

Strategic focus areas	• Information Technologies (Informatics, Telematics and Telecommunication Technologies) • Chemical Process & Energy Resources (Sustainable & Clean Energy, Environmental Technologies, Chemical & Biochemical Processes, Advanced Functional Materials)
How is inteGRIDy relevant to your organisation	There are a number of reasons why inteGRIDy is relevant to CERTH. The organisation has profound experience on pilot realisation and platforms implementation and will actively participate in the inteGRIDy Cross-Functional Platform implementation, as well as will lead the activities envisioned within WP6. CERTH will also play a crucial role in the production of the inteGRIDy Operation Analysis Framework, the integrated Visualization Platform, the advanced model-based control and optimization tools and services the pre-pilot use case realisation in Xanthi and Thessaloniki. CERTH/ITI exhibits substantial research activity as well as technology transfer actions, and employs a high-quality scientific group in the area of multi-sensorial and energy related systems, the development of simulation platforms and visual analytics for highly complex systems. It participates in research networks with assorted institutes and industrial partners in Greece and Europe and is in the process of establishing a spin-off company, to commercially exploit the research results (already available as prototypes) of the Laboratory. CERTH/CPERI exhibits substantial research activity as well as technology transfer actions, and employs a high-quality scientific group in the area of energy related systems, the development of simulation platforms for energy flowsheets and environmental assessment of energy ground-based solutions. It participates in research networks with assorted institutes and industrial partners in Greece and Europe and already has a spin-off company (Clean Energy Ltd, www.cleanenergy.com.gr), to commercially exploit the research results of the Institute. Furthermore, CERTH/CPERI provides a wide range of services related to the development and evaluation of energy systems and industrial-grade systems development. The participation of CERTH/CPERI in the inteGRIDy project will help to gain more knowledge in areas to be addressed such as advanced control for smart grid networks based on standards and web services communication from industrial automation systems, techniques for information filtering and organization for the I/O field, etc. At the same time within the inteGRIDy project, CERTH/CPERI will bring in the consortium the knowledge from its development and operation of industrial-grade process systems, regarding optimization and advanced model-based control and bidirectional communication with automation systems for common information modelling, concerning knowledge extraction form field data and the behaviour of the dynamic energy systems, as well as,

	innovative algorithms for representation of exhaustive enumeration of energy system's operation for decision support.
What content could be exploited?	CERTH/ITI has gained valuable knowledge and experience in several aspects such as DR flexibility forecasting and optimization tool that can predict the energy flexibility of a building, a Multi-Agent Based Holistic Modelling and Simulation Framework (method, algorithms and tools), based on the extracted Occupancy Models, Energy Models and Business Processes Models, Occupancy Measurement toolset for real-time occupancy monitoring and information extraction in buildings, etc. The *Visual Analytics module* supports the analysis of large volumes of space occupancy and energy consumption data. This tool utilized for the evaluation of the building performance, as well as for the visual representation of the collected data and extracted information. Such visual analytics tools can further be exploited in other domains and applications, in order to provide powerful visualization of different spatiotemporal data that can be very important for the evaluation of the performance and all its related aspects. The *Intelligent Building Control & Flexibility Prediction Toolset* constitutes of powerful dynamic and integrated tools for real-time building automated monitoring & control, allowing the prediction/forecasting of a building's energy flexibility, based on extracted profiles and current contextual conditions, while further being able to coordinate operation of building's assets in the optimal comfort & energy efficient manner. CERTH/ITI will explore the potential of exploring such tools in different Demand Response applications, targeting utility companies and ESCOs that could utilize such tools to offer similar services The *Facility Management Web-Based Interface with DER Flexibility data analytics* is a powerful web-based console able to assist Facility Managers' every day monitoring and control of a building's assets, based on the enhanced real-time and historical information provided through a multi-sensorial network and infrastructures. This asset can be extended in order to further be exploited to support powerful monitoring and control applications in different energy domains and different customer segments. In a similar manner, the main aim of the inteGRIDy project exploitation activities where CERTH/CPERI is involved is to explore the innovative aspects of the foreseen outcomes and turn them into commercially viable offers in targeted customers. These customers are either the in-house process plants or external who will request the construction or revamp of a process/automation system by CERTH/CPERI. CERTH/CPERI's integrated exploitation approach provide possible scenarios for further evolution of the developed solutions, during and after the end of the project and in combination with a periodic updated of the provided component. Furthermore, CERTH/CPERI plans to exploit the provided components, in the development of which it is directly involved (*Plant/Process/System Data Exchange Tool (DET), Supervisory Model Predictive Control for Energy Systems, Integrated*

	Decision Support & Supervisory EMS Tool) and reuse the algorithms that will be designed and developed within the specific outcomes of the project, as an integrated service for the energy systems it designs or constructs. Licensed versions or the provided tools will be available only when the components are stand-alone whereas the add-on will be part of the integrated automation system solution. CERTH/CPERI's developed and enriched with custom-built databases for materials and other RES and storage energy related components (e.g. batteries) being developed on the basis of *SimaPro software* for the environmental assessment of the demonstrated solutions in Spain and Cyprus, can be exploited to commercial oriented partners e.g. engineering companies who design smart energy systems. Except from other, companies manufacturing and EPC (Engineering-Procurement and Construction) business units can take benefit of such a tool during the definition of necessary components specifications, trying to promote the development and beneficiation from circular economy business models. The *dynamic energy process tool* embedded with house-built modules, developed by CERTH/CPERI, for the representation of components operation as those of Power to Heat can be exploited as a powerful supporting software enabling inter-connected modules for the dynamic simulation of a full energy system (production, distribution, consumption, and storage). With this tool, a list of proposed guidelines and storage with RES integration schemes can be used by business–oriented European stakeholders dealing with energy supply chain. This tool can contribute to the optimization of LV/MV interconnected components serving the needs of international market players who are active in carrying out major power plant projects throughout Europe.
Approach to exploitation	CERTH/ITI will seize the opportunity for further exploitation of the inteGRIDy project outcomes according to the institute's ambitions and activities. *Knowledge-sharing/Intellectual activities:* Both CERTH institutes plan to additionally exploit the outcomes of inteGRIDy project to the wider scientific community, by preparing and submitting to journals and conferences, papers relevant to the occupancy flow modelling and prediction techniques, multi-sensorial networks and occupancy-based demand side management. Further contributions to the wider-scientific community will be provided by diffusing the novel algorithms and techniques that were applied in the inteGRIDy framework. Regarding the prototypes that will be designed and developed for the different frameworks' modules (etc.), it will jointly collaborate with involved partners for the delivery of corresponding prototypes with corresponding licenses to the associated scientific community.

	CERTH/CPERI will further seek bilateral meetings and P2P meeting with Greek and European based energy market players. *Research activities:* CERTH is expected to gain valuable knowledge and experience in aspects such as integrative modelling combining technical and business models, energy efficiency and knowledge management. Therefore, as a research institute, will further reuse and exploit know-how, algorithms and tools resulting from the project to future R&D initiatives. Towards this direction, the aim is to provide and develop even more results, robust algorithms, open models etc. *Business activities:* CERTH/ITI is a research institute that is non-profitable and targets to knowledge dissemination and expansion. However, CERTH/ITI institute holds active collaborations with SMEs and the energy industry in Greece and in European level. CERTH/ITI will also investigate the creation of spin-off companies oriented in commercializing products derived from the above research and the participation in new spin-off commercial companies capable of exploiting its research when new market needs and solutions are identified. CERTH/CPERI will further seek exploitation through the Clean Energy Ltd. spin-off company already established.
Innovation category	• Products • Services • Prototypes • Software
Preferred commercialisation route (if applicable)	• Internal product development • Joint Venture • Spin off • Consultancy
Target users/customers	• Utility companies and Retailers already offering or targeting to enter advanced DR services, such as Watt+Volt Utility/Retailer in Greece (already a consortium partner) • Energy companies targeting to offer micro-grid services • Batteries manufacturers (as in the case of Sunlight Company in Greece, which is also a consortium partner), targeting optimal dimensioning and expected dynamic response under fluctuating conditions. • Grid operators interested in the case of decentralized energy systems (as for example the case of islands). For example, PPC and HEDNO could include such contacts, with whom CERTH collaborates in numerous services offers and R&D projects. • Micro-grid owners targeting optimal operation scheme for existing configuration

Value proposition and key benefits of innovation	• Optimised DR services, targeting both residential pro/consumer and tertiary buildings/customers • Efficient energy management (such as Green economy, Reduced carbon emissions, Decreased energy costs for the end users/customers) • Model representation of the dynamic operation of PVs, heat pumps and battery storage solutions, integrated on a detached and or district level, for simulation purposes. • Efficient management of grid assets and identification of best practices for the provision of main and ancillary services (e.g. frequency and voltage control)
Potential impact on market	• Balancing of the grid through DR (peak reduction/shaving, load shifting, ancillary services) • Increment of Renewable Energy Systems utilization and energy storage systems utilization • Shift towards hydrogen production, storage and usage as energy source. • More cost-efficient services to prosumers • Optimal dimensioning and design of PV, heat pumps, battery storage systems, for smart grid operation, both in the case of RES energy harvesting and storage
IPR Assessment	For all tools developed by CERTH, IPR belong and remains to CERTH.
Detail action plan to achieve exploitation approach	*Knowledge-sharing/Intellectual activities:* Starting from M27 and on, and as the development activities progress, appropriate scientific material will become available for preparing and submitting articles for publication to journals or for presenting them in suitable conferences. The tools developed by both CERTH Institutes will be available to tailored online repositories, for example GitLab. *Research activities:* While expanding and adjusting the Intelligent Building Control Flexibility and Forecasting tool within the inteGRIDy framework, several forecasting techniques (e.g. PV electricity production from PV panels and load forecasting) have been examined and they will be exploited by implementing them during the course of other scientific programs that are about to begin, after they have been in turn adjusted accordingly to suit the requirements of those projects. Regarding the Building Occupancy and Energy Consumption simulation tool, a clustering method has been implemented, i.e. a variant of k-means in particular, that is currently about to utilized along with some further refinements in another scientific project, more specific e-Dream. Within on-running H2020 projects, such models have been transposed to open-access software platforms (e.g. Open Modelica), while have been populated with more features, offering additional competencies to the end-user *Business activities:* At the moment of writing, Clean Energy Ltd. , for the scope of inteGRIDy, new house-built components representing the dynamic operation of main grid assets (e.g. heat pump, PV, MPPT algorithm for the PV panels controlling system) have been developed

	by CERTH/CPERI for the APROS Transient process tool, in order to accommodate the needs of the pilots, where this will be used, i.e. the Barcelona and Cyprus sites. In addition, new house-built power production forecasting modules have been developed and integrated onto the commercial platform, through coding, not previously existing in the commercial platform; thus, increasing its interoperability and competencies offered with/to other ones. However, in the course of inteGRIDy these tools have been translated into open-access Python based algorithm, offering thus additional interoperability features, as they can be linked to any type of platform.
Detail the strategies to exploit content	In the Thessaloniki pilot, via the collaboration with the other partners, such as WVT and SUNLIGHT (already consortium members) CERTH will be able to find potential customers, such as other utility providers for example, in order to exploit its assets. For instance, via the inteGRIDy framework will be able to develop software and services suitable for any utility provider, active in domestic market or abroad. Additionally, through the SmartHome platform, which serves as a powerful diffusion channel for CERTH, other potential entities, or customers might be attracted to the services provided by CERTH, such as Distribution System Operators, consumers, or prosumers, in order to fulfil their requirements, by using especially the visualization tools developed by CERTH.
Will other inteGRIDy partner(s) be involved in the exploitation of this contents? If yes, then how?	Since those tools will be deployed in Thessaloniki Pilot, where Watt+Volt and SUNLIGHT are also engaged, (already consortium members, both of them), they are both going to be involved in the exploitation of the tools developed by CERTH. Watt+Volt, as a utility provider could promote the use of the tools developed by CERTH. Within the framework of inteGRIDy the Visual Analytics Tool for Flexibility Analysis, Aggregation and Forecasting will include an Aggregator's web application and a mobile application for the end-users/consumers, which will be costumers of the former. Thus, Watt+Volt could participate in promoting the services of this tool to its own customer portfolio for Demand Response programs. SUNLIGHT, as a Battery Energy Storage System designer, integrator and manufacturer, will play a key role in promoting the set-up as a whole that is going to be developed within the inteGRIDy project and will incorporate equipment procured by SUNLIGHT itself and software tools developed by CERTH.
Any other exploitable result (i.e. another product), which has been recognised as complementary, and thus might be marketed together with the described exploitable result under certain conditions.	Various tool components, mainly from the Intelligent Building Control Flexibility and Forecasting tool, developed during the project have been integrated in CERTH's SmartHome innovation-hub. More specifically, the Battery Energy Storage System (BESS) optimization engine, responsible for generating a BESS optimized day-ahead schedule; the forecasting tool responsible for generating a load forecast and finally a monitoring tool responsible for applying the BESS optimized day-ahead schedule in real-time. More can be found at the following link: (https://smarthome.iti.gr/)

Business model for the exploitable contents suitable	The Thessaloniki Pilot is titled: “Flexible DR at Residential and Tertiary Building with Local Storage” with a business model that has the following value proposition: “Our DSM Solution aims at aiding primarily the facility managers of commercial buildings who want to obtain energy costs savings by reducing the electricity bill.” Thus, the business model directly at the heart of the exploitation strategy for this pilot.

Partner	**Politecnico di Milano**
Organisation profile	The Politecnico di Milano (English: Polytechnic University of Milan) is the largest technical university in Italy, with about 40,000 students. It offers undergraduate, graduate and higher education courses in engineering, architecture and design. In particular, the Department of Energy, born on January 1st, 2008, is a structure created under the impulse of professors and researchers previously belonging to four departments traditionally related to the energy sector: • Department of Energy Engineering • Department of Electrical Engineering • Chemistry, Materials and Chemical Engineering "Giulio Natta" • Department of Nuclear Engineering To fulfil its R&D objectives the Energy Department makes use of the proper operating tools of the scientific and technological research in the engineering field, in connection with several laboratories of modelling and numerical simulation and experimental laboratories belonging to the five Department divisions: • Chemical Technologies and Processes and Nanotechnology Division • Electrical Division • Nuclear Engineering Division – CeSNEF • Fluid Dynamic Machines, Propulsion & Energy Systems Division • Thermal Engineering & Environmental Technology Division
Value proposition	Leading technical university offering undergraduate, graduate and higher education courses in engineering, architecture and design.
Strategic focus areas	• Smart cities and communities • Smart Grid concept • Mobile energy storage • Distributed generation technology • Renewable energy sources • Electric Power System
How is inteGRIDy relevant to your organisation	The research activity of the Electric Power System Group, which directly cooperate in the inteGRIDy project, is focused on the main topics related to the power systems, from the production to the final use. In particular, the main research fields are: **Power systems analysis and control:** The EPS group has developed innovative models to assess the electric system static and dynamic security, with particular attention to voltage security. The research activities deal with the stability for large and small perturbations, using ad hoc algorithms and time-domain simulations. Different techniques are adopted, such as interior point algorithms and artificial intelligence tools, including genetic algorithms, fuzzy logic and neural networks. Currently, research activities are also carried out on the stochastic security assessment (including dynamic

	rating), stochastic optimization for renewable integration and on optimization of microgrids design and operation in developing Countries. **Market operation:** Competition has been introduced in the electricity world, in order to decrease electricity prices and enhance economic efficiency. The conventional integrated electric utilities have been restructured and substituted by competitive markets. However, in some cases, the new electricity markets look more like an oligopoly than to a perfectly competitive market. The EPS Group has developed studies and simulation methodologies of the electricity market, applying statistics, power market analysis and the game theory. Different models are adopted such as the equilibrium models, in order to consider each participant's strategy: either the supply function equilibrium models, chosen as the basis of many power market models, or the conjectural supply function model. Moreover, a market approach is also used for the reactive power, in order to determine an economic compensation of the reactive power/voltage control service. **Market regulation:** The EPS Group is active in developing models able to assess the influence of the different players on costs and on environmental issues. Concerning the regulatory issues, the EPS Group works on the setup of the Italian distribution grid code for both HV/MV and LV networks. The Group is active not only in Italy but also in some developing Countries. The main research subjects are quality of service regulation in Italy and in the EU, definition of regulation (Grid Codes) for renewables. **Dispersed Generation, Smart Grids:** The EPS Group is active in the evaluation of the DG impact on the electric system, analysing solutions that can result in a better DG penetration in the distribution networks. Starting from the evaluation of the distribution networks hosting capacity, the work is oriented both to long-term possibilities, the so-called smart grids, and to short-term ones, such as intermediate models of active grids able to accept immediately the DG opportunities. In this context, the EPS Group works on the innovative coordination control of load, storage and DG. With respect to the topics of the project here proposed, the EPS group developed tools for the optimization of the distribution grid, both for the planning and for the management of the infrastructure. These tools are available for different SW platform (based both on commercial, e.g. DigSilent Power Factory, and research, Matlab, packages).
What content could be exploited?	POLIMI research team will use inteGRIDy project in order to implement and demonstrate the effectiveness of the "smart algorithm" developed in the labs. Similarly, POLIMI will evaluate tools developed by partners in order to perform a cross study of the "smart grid approaches". Results will be promoted to the POLIMI international scientific network in international conferences, workshop, etc.
Approach to exploitation	POLIMI team is today quite active in providing technical consultation both to public bodies and private companies.

	Thanks to the knowledge improvements driven within inteGRIDy project, the research team is expected to strengthen his commercial activities. From a scientific point of view, the POLIMI research team is also very active in publishing papers and in international committee. Thanks to this network, the team will share and promote inteGRIDy outcome at international level.
Innovation category	• Services • Prototypes • Software
Preferred commercialisation route (if applicable)	• Consultancy • Spin off
Target users/customers	DSO, Retailers
Value proposition and key benefits of innovation	The project is focused on an innovative approach to the monitoring and control of the distribution grid. The benefits of the innovation rely in the implementation of the proposed control logics in real life equipment, deployed in a real-life distribution grid. The final goal is to foster both the evolution of the regulatory framework in Italy and the development of commercial product capable to effectively operate in the new Smart Grid scenarios.
Potential impact on market	New approaches (i.e. control logics) will be implemented and tested in order to properly manage the MV distribution grid. The Pilot will impact on a HV/MV distribution grid. Results could be duplicated over 2000 HV/MV substations in place in Italy. Similarly, in the project a new approach for the coordination of many Battery Energy Storage Systems (deployed in Low Voltage users' premises) will be developed and tested. In the new ancillary services market, a new actor, commonly named aggregator, will be in charge of coordinating all these resources. The control logics developed will results to be a term of reference for the retailers willing to act as an aggregator in the Italian Market.
IPR Assessment	No IP generated on the project
Detail action plan to achieve exploitation approach	As it was mentioned in the question 6, the two main exploitation approaches regarding inteGRIDy project is strength of commercial and scientific activities. More commercial and industrial activities could have been achieved through more cooperation with industrial inteGRIDy partners related to San Severino Marche pilot. Since there are several defined use cases for this pilot which each of them requires different activities such as data and information gathering (e.g. data from SCADA own by DSO, external service for weather forecast, etc.), generating software codes and optimization, close collaboration (i.e. regular conference call, meeting, one to one discussion) with industrial partners and DSO is necessary. In the next step all of the technical achievements could be gathered in the format of scientific papers for publishing in journals or presenting in

	the conferences. To do so POLIMI team merging these achievements with a related literature review to highlight the strength of the results and inteGRIDy project.
Detail the strategies to exploit content	Both POLIMI algorithms and other partners involved in San Severino pilot tools could have been evaluated and tested with POLIMI equipped laboratory and well-experienced team. Again, since different use cases have been considered for this pilot, different evaluation process and tests required to be performed. Activities such as grid optimization, state estimation analysis, load forecast using their input data gotten from in place devices (e.g. sensors) could have been tested software based by POLIMI team. While, some of them including energy storage related to Zhero technology first have been tested in POLIMI laboratory.
Will other inteGRIDy partner(s) be involved in the exploitation of this contents? If yes, then how?	All of the required data to perform the fundamental analysis from SCADA have been received by DSO of San Severino Marche (ASSEM). Moreover, in order to perform tests and analysis related to the energy storage of Zhero technology (Industrial battery) UNE has collaboration with POLIMI.
Any other exploitable result (i.e. another product), which has been recognised as complementary, and thus might be marketed together with the described exploitable result under certain conditions.	No
Business model for the exploitable contents suitable	It's not clear to us if the Business plan you are referring to is related to the market exploitation of the tool developed by POLIMI or if the question is related to the Business model of the Pilot itself (i.e. the integration of such tool in the DSO control center; consequently the DSO is supposed to be the main actor involved in the business evaluation). Nevertheless, for both the cases, the business plan proposed in T3.4 seems to be somehow not directly fitting with our case.

Partner	**UCY**
Organisation profile	The University of Cyprus was established in 1989 and admitted its first students in 1992 with an incoming class of 486 undergraduate students. During the academic year 2013-2014 there were 7048 students (undergraduate and postgraduate) across 8 faculties, 22 departments and 11 research units at UCY. The University of Cyprus aims to establish itself as a Pioneer Research Institution achieving International Scientific Recognition in European Higher Education, offering Competitive Programmes and to become a Centre of Excellence in the wider Euro - Mediterranean Region. The main objectives of the University are twofold: the promotion of scholarship and education through teaching and research, and the enhancement of the cultural, social and economic development of Cyprus. Furthermore, the Research Centre for Sustainable Energy (FOSS) was created in order to play a key role in research and technological development activities in the field of sustainable energy within Cyprus and at international level with the aim of contributing to the achievement of the relevant energy and environment objectives set out by Europe. In particular, the FOSS strives to become a centre of excellence in energy that will act as a structure where world-standard R&D work can be performed, in terms of measurable scientific production (including training) and/or technological innovation. In FOSS, significant research expertise from the University of Cyprus as well as from industry has been assembled that spans a host of fields: Electrical, Mechanical, Civil, Environmental, Chemical engineering, to Physics, Chemistry, Economics, Finance, as well as Architecture. The FOSS team aims, with the development of the necessary synergies, to create the impetus for the advancement of the field of energy. Members of the Centre represent Cyprus in European Energy Committees such as the Energy Committee for the Horizon 2020, the SET Plan, the European Technology & Innovation Platform SNET and PV and the European Standards Committees on PV. Furthermore, the FOSS staff act as expert evaluators for predominantly Energy Proposals within Horizon 2020 and other National initiatives. Furthermore, the researchers comprising the working team have extensive experience in grant proposal applications and have acquired funding for a range of research topics through the EU, the National Research Funding Agency in Cyprus as well as industry.
Value proposition	• World-class learning environment from teaching and research • Deep sustainable energy expertise and capabilities • Dedicated facility for energy research and development
Strategic focus areas	• Sustainable Energy research and development • Cultural, social and economic development of Cyprus • Establishment of facilities for transforming the university into a green campus with microgrid controls for effective energy and demand side management. • Establishing affiliations with European, Middle East and worldwide Universities

How is inteGRIDy relevant to your organisation	The University of Cyprus has set the goal of becoming energy self-sufficient using energy produced from sustainable energy sources. To achieve this, 10 MWp of PV, 1 MWhr of electrochemical storage, EV charging/discharging stations, solar thermal units and heat pumps will be engaged (own funding) together with the existing rooftop PV installations. All of these systems will be combined with Demand Side Management (DSM) and optimum use of resources all the year-round including capabilities offered through a planned micro-grid architecture. The DSM will be based on a single point of control, which will integrate the several existing and future Building Energy Management Systems (BEMS). Current plans include the following: the installation of smart sensors, smart metering infrastructure and micro-grid controllers (own funding) for the efficient operation of the micro-grid infrastructure in full coordination with the local grid operator. Moreover, autonomous weather stations, monitoring the POA irradiance, ambient and module temperature are implemented in 17 locations in Cyprus and all collected data are stored at a centralised database at the UCY premises. Additionally, the pilot use case extends outside the University's premises as 35 dispersed households within Cyprus under the PV net-metering policy are equipped with smart-meters enabling the bidirectional flow of information, the active use of DSM techniques and the smartening of the current distribution system. The whole micro-grid structure and the dispersed prosumers within Cyprus will be operated under the supervision of the local DSO (EAC) allowing the real data accessibility from the network, which represents the essential preconditions for carrying out smartened grid network operation (from DSO side) combined with local DER (from the end user premise). Demo activities will apply the proposed inteGRIDy functional modular platform in the context of the afore described smart RES system through the use of Field Middleware, addressing the efficient interconnection as well among energy networks (electrochemical and thermal storage).
What content could be exploited?	UCY as a pioneer in the research field will utilize the cross-functional platform provided within inteGRIDy in order to increase the energy efficiency within the university campus. By activating the identified control points within the campus, the microgrid concept will be implemented. The target is to transform the University of Cyprus into a "living laboratory", which will use its own RES production in order to cover the electricity needs. DSO will take advantage of the controllable microgrid and the controllable prosumers within Cyprus in order to solve grid issues (such as violations of the voltage profile, grid congestion issues, power quality deterioration, etc.).
Approach to exploitation	The cross-functional platform of inteGRIDy will be utilized in order to combine all the information provided by the smart metering infrastructure (for RES production, energy storage and energy consumption) and installed sensor systems within the university campus microgrid with the forecasted energy. The target is to increase

	the controllability of the microgrid in order to increase the efficiency in the energy flows. The platform provided by inteGRIDy will be utilized by the dispersed prosumers in order to offer ancillary services to the DSO through the controllable demand response. The DSO will use the controllability of both the microgrid and the dispersed prosumers in order to resolve the above referred grid issues.
Innovation category	• Services
Preferred commercialisation route (if applicable)	• Spin off • Consultancy
Target users/customers	• *DSOs,* • *commercial and / or industrial complexes that can act as a single point of common coupling to the local grid* • *prosumers.*
Value proposition and key benefits of innovation	• Maximise the benefits of using dynamic tariffs for minimising the cost of energy to the end user. • Quantify the Demand Response capabilities of the commercial / industrial entity or aggregated prosumers and offer it to as flexibility to the DSO for managing grid needs: voltage profile, congestion, quality of supply etc • Identify demand management efficiencies for reducing consumption and hence less euros and less CO_2 emissions.
Potential impact on market	Strengthen the position of end users through the use of the inteGRIDy functional modular platform for improved efficiencies, trading flexibility and capitalising on the opportunities offered by dynamic tariffs. The portfolio of aggregators is enriched offering added benefits to the end users through their collective effort.
IPR Assessment	*No*
Detail action plan to achieve exploitation approach	Achieved results will be documented with actual measurements revealing the benefits of using the developed tools to manage the energy resources and loads of complex systems of big commercial and industrial centres. Payback period will be validated, identifying the life cycle benefits of prospective users. The responsiveness to system needs through the generated flexibilities will be demonstrated through simulations giving the identified benefits to their full stretch, identifying the areas that will be useful to stakeholders and potential buyers. The identified benefits will be extended to dispersed prosumers that can provide similar benefits through aggregation services. The results achieved will be rolling through the months and seasons giving content to the benefits achieved over the year, revealing the diversification of seasonal and monthly use. Results presented will be detailed with numerical examples to give facts and figures to interested parties.
Detail the strategies to exploit content	The algorithms to be developed have the capability of quantifying available flexibility which can be made available for trading in the flexibility market once established. Possible revenues will be compared to cost energy savings and higher will be selected. The quantities generated through managing the resources within the microgrid and

	aggregated from the dispersed prosumers will be documented and made available to the market actors to take them into consideration when they plan their operations. Thus, generating the interest in flexibility market growth.
Will other inteGRIDy partner(s) be involved in the exploitation of this contents? If yes, then how?	Yes. FOSS is managing all the resources of the university of Cyprus and EAC the second partner, is the DSO operating in Cyprus seeking for flexibility solutions in managing the everyday operations of the grid. Thus, the developed solutions both for big commercial centres and dispersed prosumers have been collectively designed to suit the needs of the Cyprus electricity market.
Any other exploitable result (i.e. another product), which has been recognised as complementary, and thus might be marketed together with the described exploitable result under certain conditions.	*Yes, we can see the following products can add to the capabilities of the adapted solutions and they are found as complementary:* • *Intelligent building control and flexibility prediction forecasting by CERTH.* • *Building occupancy and energy consumption simulation by CERTH.*
Business model for the exploitable contents suitable	*Yes, it is aligned covering all exploitable paths.*

Partner	**UCP**
Organisation profile	Universidade Católica Portuguesa is among the best universities in Portugal and the business school is the number one business school in Portugal according to the Financial Times Ranking (ranked 26 in Europe). Its MBA programme is ranked 36th in the world. The business school has strong ties to Portuguese businesses, the national government and the city administration of Lisbon. UCP has a tradition of national and internationally funded research projects within innovation, strategy and organizational fields.
Value proposition	• Teaching excellence and practical relevance of programs • Leading provider of Management and Economics students • Lifelong learning environment to advance the understanding of business and economic decision making
Strategic focus areas	• Recognition as a hub for pan-Atlantic business • Generation of original research
How is inteGRIDy relevant to your organisation	Universidade Católica Portuguesa will contribute skills around business modelling, entrepreneurship, international policy analysis and international firm strategy. The intention will be to understand and exploit understanding through the interplay and intersection of three areas: business modelling, sustainable technologies and policy-firm interplay. In order to bring the newly emerging business models at the intersection of electricity, mobility and big data to the market, new tools and frameworks are required. For this purpose, a novel online tool has been developed (the Business Model Tool) which relies on state-of-the-art knowledge of business modelling. It is the first ever tool that brings business modelling closer to implementation, integrates creativity stimulating templates and includes a testing routine for business model quality, particularly suited and catered for ventures in the energy industry. This tool and the related knowledge and frameworks can greatly improve the marketability of the inteGRIDy results. Moreover, new business models have to be seen in the context of international institutions. Our research has studied the international context and impact of institutions on business models. This will allow a tailored fit of business models to country specific and consumer specific requirements.
What content could be exploited?	Based on the work in inteGRIDy, UCP will be able to further improve the Business Model Tool and frameworks it is based upon.
Approach to exploitation	Exploitation will focus on the Business Model Tool with the goal of improving it to the point where practitioners in the energy industry around Europe can use it. At the moment, we are actively investigating options to exploit the final outcome by creating a spinoff and market the product at European and global level.
Innovation category	• Services

	• Software
Preferred commercialisation route (if applicable)	• Spin off
Target users/customers	The primary target customers of the Business Modelling Tool are start-ups and established companies in the energy industry who would like to develop their business model or transform the existing one.
Value proposition and key benefits of innovation	The Business Model Tool is designed to help the energy industry in its transformation toward more sustainable business models focused on maximizing benefits for all stakeholders involved, including the newly emerged market actors. Therefore, the *Business Model Tool* is a one-stop business modelling solution for start-ups, corporations and technology providers who want to 'test-drive' different business models and find novel ways of creating and capturing value with their innovative energy solutions. The Business Modelling Tool helps practitioners to do so in just five steps: 1. Learn about the process of business modelling. 2. Build a business model using a pattern library specifically designed for the energy industry. 3. Ideate and `test-drive` other potential business model options using a wider selection of business model patterns collected from other major industries. 4. Do a qualitative assessment of the created business model options and recommend the most promising ones to decision makers in your organization. 5. Assess the replication potential of a business model developed for a home country in foreign countries (with the focus on the EU countries at the beginning).
Potential impact on market	Providing a business modelling platform that allows energy industry practitioners to create viable business models based on sustainable values, know where and how to internationalise and make a compelling recommendation to decision makers in their organisations. Having a unique value proposition, UCP`s ambition is to bring the Business Modelling Tool to the position of a market leader in online business modelling.
IPR Assessment	Until know all newly generated knowledge has been made publicly available via publications or presentations. However, in the future IP might be generated.
Detail action plan to achieve exploitation approach	As the Business Model Tool is used to support the development of business models in inteGRIDy, the value of the tool to the practitioners in the energy industry will become evident through the achieved results. The results and the business modelling methodology (which incl. Business Model Tool) supported its accomplishment will be communicated not only to the inteGRIDy community but also to the outside world (i.e. through the inteGRIDy website and by participating in relevant events). To bring the tool further to the market and support

	the market entry, we will explore possible funding approaches and apply for relevant programs (i.e. SME Instrument, which is a part of the European Innovation Council pilot and similar programs). In parallel, a go-to-market strategy will be developed to identify the most suitable potential customers in the energy industry, as well as the strategies for each step in the customer lifecycle (acquisition, activation and retention).
Detail the strategies to exploit content	With regard to the improved and newly developed frameworks (which are also a part of the Business Model Tool), these will be further exploited in the educational environment, i.e. through developed case studies, and the consulting work of UCP-SCIL, which we conduct for companies in the smart city domain (incl. companies active in the energy domain at a national and international level). Regarding the Business Model Tool, the vision for it is to serve and be useful for practitioners in various segments in the smart city domain, including energy, mobility, water, health etc.
Will other inteGRIDy partner(s) be involved in the exploitation of this contents? If yes, then how?	No, we do not foresee involvement of other partners in the exploitation of the Business Model Tool.
Any other exploitable result (i.e. another product), which has been recognised as complementary, and thus might be marketed together with the described exploitable result under certain conditions.	No, at this stage we have not identified any complementary exploitable results.
Business model for the exploitable contents suitable	The development of the business model for the Business Model Tool is not a part of the inteGRIDy DoA. Thus, possible business model options for the tool won`t be explored within the project.

Partner	**TEES**
Organisation profile	Teesside University (TEES), based in North East of England, is founded on a rich heritage, which has influenced its development into the dynamic, energetic and innovative institution it is today. It currently has 18,000 students and 2,300 employees. In 2009, TEES was named UK University of the Year at the Times Higher Education Awards and won the 2018 Times Higher Education Leadership and Management Awards' Knowledge Exchange Initiative of the Year for its work in establishing and supporting the Digital Cluster in the the Tees Valley. Within TEES the School of Science, Engineering and Design (SSED) carries out multidisciplinary research spanning innovation in process control, energy and environment, life sciences, security business and enterprise as well as providing consultancy services to industry. Such work is conducted in collaboration with a wide number of academic and commercial partners. SSED has more than 50 academic members plus research staff and 35 PhD students. In the latest research assessment by the UK government SSED attained its highest ever performance rating, with 59% of research recognised as world-leading or internationally excellent, and 90% of research having world-leading or internationally excellent impact.
Value proposition	• World class teaching • Deep technology and industry expertise • Multidisciplinary research spanning innovation in process control, energy and environment, as well as life sciences
Strategic focus areas	• Science, Engineering and Design • Computing, Media and the Arts • Health and Social Care • Social Sciences, Humanities and Law • Business
How is inteGRIDy relevant to your organisation	The project is relevant to Teesside University for a number of reasons. TEES School of Science, Engineering and Design (SSED) carries out multidisciplinary research spanning innovation in process control, energy and environment, life sciences, security business and enterprise as well as providing consultancy services to industry. Recently, Teesside University has participated in EU projects related to energy efficiency, building information modelling, and energy management systems. TEES developed DR energy management optimisation tool within the EU FP7 project IDEAS which will be integrated with the tools provided by the other inteGRIDy project partners, thus contributing to the project Objective 1 to Integrate a set of innovative tools and technologies under a scalable and replicable platform. The tool will be demonstrated within the project, thus contributing to the Objective 4 to Demonstrate an integrated Decision Making and Optimisation Framework. Teesside University will also contribute significant knowledge and experience in demand response at a neighbourhood scale, the wider energy industry and data management approaches.

What content could be exploited?	Neighbourhood Energy Management Optimisation (NEMO) tool. The tool is able to predict energy demand based on historic time series data and current temperature forecasts. It can send signals to optimize allocation of energy generation between the generation assets, based on the criteria of cost reduction and/or CO_2 emission reduction. For such purposes it interfaces to SCADA and other communication protocols. Associated services / tool modules may be exploited separately as well: energy demand prediction, optimisation of energy allocation between different generation assets, algorithms for communication with SCADA systems.
Approach to exploitation	Provided successful demonstration of NEMO capabilities, we would pursue the following: • Commercial partnership(s) with established market players within inteGRIDy consortium and/or externally toward commercialization of NEMO and/or its modules; • Explore the possibility for IP protection / patenting; • Explore the possibility for setting up a start-up company for commercialization of NEMO tool and its modular services.
Innovation category	• Products • Services • Prototypes • Software
Preferred commercialisation route (if applicable)	• Internal product development • Assignment of IP to third party • Licensing • Joint Venture • Spin off • Consultancy
Target users/customers	Industrial manufacturing software and service companies, Energy Service Companies (ESCOs), Building Owner, facilities management
Value proposition and key benefits of innovation	In the case of DNOs; • Up to a 100 % reduction in the investments required for the reinforcement of the wider electricity distribution network to service new urban developments, • Significant reductions in the total investments in network reinforcement required to integrate DREG into current electricity networks, • Supporting the incremental upgrading of the ‘dumb’ electricity distribution networks to the 'smart' networks required to integrate DREG into current electricity networks. In the case of ESCOs, building owners and facilities management;

	• Up to 30% increase in the revenue generation from distributed renewable electricity and heat production • Up to 10 % increase in the efficiency of distributed renewable plant In the case of Industrial manufacturing software and service companies • Significant increases in the accuracy of their product and service offerings for building energy management
Potential impact on market	The NEMO prediction and optimization tool for energy management have the potential to increase profits from combined heat and power (CHP) plant and other distributed renewable energy plant and reduce CO_2 emissions. It enables up to: • 30% increase the revenue generation from distributed renewable electricity and heat production; • 10 % increase in the efficiency of distributed renewable plant. • reduce CO_2 emissions from buildings by up to 58%
IPR Assessment	*Are you generating any new intellectual property on inteGRIDy? This is to be confirmed depending on the functionality added to the NEMO tool during its implementation at the pilot sites.*
Detail action plan to achieve exploitation approach	
Detail the strategies to exploit content	
Will other inteGRIDy partner(s) be involved in the exploitation of this contents? If yes, then how?	
Any other exploitable result (i.e. another product), which has been recognised as complementary, and thus might be marketed together with the described exploitable result under certain conditions.	
Business model for the exploitable contents suitable	

Partner	**UNEW**
Organisation profile	Newcastle University is among the top 20 higher education institutions in the UK in terms of research power, according to the influential professional publication, Research Fortnight. This is based on the results of the latest Research Excellence Framework (2014), which found that the vast majority of Newcastle University's research was placed in the top two categories of 4*(world leading) or 3* (internationally excellent). The University has one of the largest European Union research portfolios in the UK: around 235 FP7 projects worth over €100million to the university; and so far, over 40 projects awarded under Horizon 2020. The University also has research links with many other countries. It is a member of the prestigious Russell Group, comprising 24 leading research institutions in the UK and in the year ended 31 July 2015, its total research income equalled around €120 million. Newcastle University is ranked in the top 1% of universities in the world (QS World University Rankings 2014). The student population in 2014-2015 stood at 22,673 (UK campus) with 5250 overseas students from over 120 countries. A further 1191 students are based at our campuses in Malaysia and Singapore. UNEW offers several hundred programmes at undergraduate and postgraduate level spanning Medicine, Science, Agriculture, Engineering, Social Science, Arts, Humanities, Languages and Education.
Value proposition	• World class university • Deep technology and industry expertise, particularly in electrical power • Home to the National Centre for Energy Systems Integration
Strategic focus areas (within electrical power group)	• Power Electronics • Power Systems • Drives and Control • Machines • Hybrid Electric Aerospace
How is inteGRIDy relevant to your organisation	The InteGRIDy project aligns closely to Newcastle University's research interests within the field of electrical power. The group of Electrical Power at Newcastle University is one of the strongest research groups in UK and it covers all areas of electrical power, ranging from power systems to electrical drives/machines and power electronics. The group is considered to be one of the world's leading research teams with international collaboration, large research funding from EU/UK, multiple esteemed publications and a very strong collaboration with industry. The university has two newly built research facilities (The Smart Grid Lab and Energy Storage Test Bed) that are part of Newcastle's £200 million flagship project Science Central, which brings together academia, the public sector, communities, business and industry to create a global centre for urban innovation and sustainability. These two states of the art research facilities will enable the university to develop the power network model as well as the optimum smart grid topology suitable for the Isle of Wight pilot. These facilities

	combined with the extensive experience that the research team at Newcastle University has, on power systems and all aspects of smart grids, makes the InteGRIDy project very relevant to Newcastle University.
What content could be exploited?	Newcastle University electrical power research group has extensive experience in developing, implementing and trialling distribution network management tools. Newcastle University will apply its experience and connections with distribution network operators to the definition and implementation of the cross-functional modular platform (CMP).
Approach to exploitation	Newcastle University will contribute to the definition, development, simulation and implementation of InteGRIDy's CMP. Newcastle University electrical power research group has been working closely with distribution network operators, who are the potential users of the CMP. UNEW can therefore ensure the DNO's views are reflected in the definition of the CMP. Simulation model of the pilot case, Isle of Wight in this case, will be built by UNEW. Such model can be used to test the performance of InteGRIDy's CMP in a safe simulation environment but also carry out infeasible trials, which are unlikely to be realised in real world. Such pre-implementation simulation can build confidence for the actual implementation of the CMP. UNEW will also use its experience in designing and analysing trials for the CMP in collaboration with the DNO.
Innovation category	Services
Preferred commercialisation route (if applicable)	Assignment of IP to third party
Target users/customers	The target users are the researchers and solution developers.
Value proposition and key benefits of innovation	The researchers can assess the behaviour of the electric network, or to schedule the loads and the generators, or to test the control algorithm on the model of the electric network.
Potential impact on market	A solution developer can assess the impact of his solution on the electric network.
IPR Assessment	No IP likely to be generated at this stage.
Detail action plan to achieve exploitation approach	Newcastle University has developed an action plan to achieve the suggested exploitation plan. Firstly, UNEW contacted the distribution network operator in Isle of Wight, Scottish and Southern Electricity Networks (SSEN), and discussed his views and needs, in general, and that for the pilot case, Isle of Wight. SSEN provided UNEW with the datasets from the distribution network in Isle of Wight. This is to simulate the distribution network, define the bottlenecks in this network, and suggest solutions. Secondly, simulation model of Isle of Wight built by UNEW. This model used to test the performance of InteGRIDy's CMP. Simulations are carried out and the main findings are reported to SSEN. One of the suggested solutions to overcome the distribution network in Isle of Wight is to use the energy storage systems. The InteGRIDy's CMP

	showed the impact of this solution before implementing this solution in real world. Thirdly, UNEW contacted also E.ON to consider its needs. The InteGRIDy's CMP is extended to include the heat map of considered pilot case. Finally, UNEW in collaboration with E.ON, Isle of Wight Council, and CERTH is designing trails to show the impact of using Fuel cells and electrolysers on the distribution network.
Detail the strategies to exploit content	Newcastle University defined the target stakeholders related to the considered pilot case: Isle of Wight. These stakeholders are SSEN and E.ON. Then, UNEW held many meetings with these stakeholders in collaboration with Isle of Wight Council. The meetings led to define the key functionalities required from the cross-functional modular platform (CMP). After that, UNEW used its experience in trialling distribution network management tools, and developed some scenarios. The simulation results of these scenarios, which represent a direct implementation of the CMP, are presented, and reported to SSEN and E.ON. Comments and feedback of SSEN and E.ON are used to enhance the CMP and consequently to increase the satisfactory of the main stakeholders.
Will other inteGRIDy partner(s) be involved in the exploitation of this contents? If yes, then how?	*CERTH is involved in the exploitation of the InteGRIDy's CMP by developing a sizing tool for hydrogen storage assets. This new tool will be integrated into the InteGRIDy's CMP.* *Isle of Wight Council is also involved in providing data, and information about the status of renewable energy sources in Isle of Wight. The council is also involved in providing feedback about the match between the results of considered trails and the needs of Isle of Wight.*
Any other exploitable result (i.e. another product), which has been recognised as complementary, and thus might be marketed together with the described exploitable result under certain conditions.	*The sizing tool for hydrogen assets developed by CERTH can be integrated with the exploitable results of UNEW. This is valuable for the users of InteGRIDy's CMP who are interested in using hybrid storage facilities: Hydrogen and Battery.*
Business model for the exploitable contents suitable	Yes

Non-profit organisations

Partner	**E@W**
Organisation profile	Energy@Work is an innovative non-profit start-up organisation founded in 2014. It is located in Apulia, Italy. The main goals for Energy@Work are the exploitation of researchers' activities, protecting national young excellences in research, promoting on its own territory and abroad technological research and innovation.
Value proposition	• Energy@Work aims to raise up territory competences creating contact between researchers and companies through research and development, supply engineering and consulting services. It has expertise in several areas including: energy efficiency at both building and district level, design and development of ICT systems for industrial automation.
Strategic focus areas	• Energy efficiency, • ICT, • Automation and control.
How is inteGRIDy relevant to your organisation	Members, even if under 35 years old, can show off wide and substantial experience in energy efficiency, ICT, automation and control. The scope of Energy@Work is to fill up existing gap between applied and industrial research, supporting partners during development of high technological products or services, disseminating and validating results, promoting partnerships between public and private entities. The participation to the inteGRIDy project allows to Energy@Work to consolidate its know-how in the areas of smart grid and DR, acquiring new methodologies and skills in order to create innovative products/services to be propagated at regional and national scale.
What content could be exploited?	Results of the analysis executed within the project regarding operational, regulatory and functional aspects together with the results of the surveys will be exploited allowing an enhanced vision of the barriers and the potential of the innovations as well as the future trends of the sector. The skills acquired during the inteGRIDy activities will enable Energy@Work to better understand the application context for smart grid technologies at national and European level.
Approach to exploitation	Energy@Work aims to promote through its own growing network the dissemination of the scientific results and the best practices acquired and/or consolidated within the inteGRDy project. The participation to sector events, with particular attention to the regional contest, will enable the diffusion of a culture focused on energy efficiency at territorial level, while facilitating the adoption of innovative solutions through an appropriate technology transfer to public and private actors.
Innovation category	• Services • Prototypes • Software

Preferred commercialisation route (if applicable)	• Internal product development • Spin off • Consultancy
Target users/customers	• Building owners • DSOs • ESCOs • Aggregators
Value proposition and key benefits of innovation	The technological outcomes that will be achieved during the inteGRIDy projects will allow Energy@Work to consolidate its technical skills aimed at developing innovative functionalities able to improve the interaction and interfacing between the different components that constitute a complex control system for the smart grids
Potential impact on market	The development of the necessary know-how for the creation of a suite of innovative services for flexibility able to make GRID more efficient through the exploitation of energy produced from renewable sources, envisaging new forms of prosumers involvement.
IPR Assessment	Are you generating any new intellectual property on inteGRIDy? No
Detail action plan to achieve exploitation approach	With the aim to promote the dissemination of the scientific results and the best practices acquired and/or consolidated within the inteGRIDy project, E@W is participating in various local initiatives and networks such the events organized by the Apulia region as part of the Apulian lifestyle initiatives. The Apulian lifestyle initiatives are based on Scientific Conference, Temporary co-working and b2b meetings between Italian innovative companies and start-ups, expression of the local economy engaged in sustainable development, and their potential customers. Furthermore, in this context, there are also to consider the relations with the other companies associated with Legacoop, italian cooperative federation that today brings together over 15,000 cooperative enterprises in all sectors with which E@W has a strong and consolidated partnership.
Detail the strategies to exploit content	Within the survey on elicitation of Stakeholders, Market needs and implementation priorities, the perspective of System and Market operators as well as Policy Makers (considered as end-user and beneficiaries of the innovations) in the application context for smart grid technologies at national and European level have been identified and well understood. Thanks to the identification, in a more consistent way, of the Market needs and implementation priorities from the experiences of the various stakeholder interested in the project challenges, Energy@Work has planned a process of acquiring these feedbacks in its business solutions. In particular, 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. Thanks to the experiences acquired in InteGRIDy, E@W has planned the integration in the solution of specific services such as Demand Response functionalities to ensure further savings by appropriately triggering of an efficient response from an input signal and services for the optimal management of storage systems combined with renewable sources. 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.
Will other inteGRIDy partner(s) be involved in the exploitation of this contents? If yes, then how?	Energy @ Work continues to maintain, even outside the InteGRIDy project, a relationship of confrontation on topics covered by the project with different partners of the consortium, such as Engineering, Teesside University, Certh, ASSEM, ASM and Atos, with whom it collaborates on other H2020 projects. Moreover, with some of them, E@W has started a discussion to explore possible future collaborations.
Any other exploitable result (i.e. another product), which has been recognised as complementary, and thus might be marketed together with the described exploitable result under certain conditions.	Energy@Work is looking with attention to the results of the inteGRIDy project in order to understand which solutions can be integrated with our business solutions.
Business model for the exploitable contents suitable	Yes

Partner	**ENOVA**
Organisation profile	LISBOA E-NOVA is a non-profit association operating under private law that seeks to contribute to the sustainable development of the city of Lisbon through mainstreaming good practices in urban planning, construction, urban management and mobility, involving all the city's key stakeholders, among political decision makers, all major urban stakeholders and the citizens of Lisbon. LISBOA E-NOVA is composed by a General Assembly, a Board of Administrators, a Consultancy Committee and a Supervisory Board. The General Assembly comprises 17 affiliates who are active in very distinct sectors, including local administration, education, water and energy utilities, transport, among others. LISBOA E-NOVA is responsible for the development and monitoring of Lisbon's Energy-Environment Strategy, signed by the Lisbon Municipality in 2008, setting targets in the field of energy, water and materials resources, for the period from 2009 to 2013. LISBOA E-NOVA also coordinates Lisbon's participation in the Covenant of Mayors assuring the communication with the European Commission and the status of results. Within this context Lisboa E-Nova coordinates several projects, both in the technical and communication fields, with which it addresses the sustainability challenges that the Lisbon city faces, raising the awareness of all key stakeholders and motivating their participation in the systematic and continuous improvement of the city's energy and environmental performance.
Value proposition	• Direct project experience to improve Lisbon's energy and environmental performance • Independent engagement with city stakeholders for sustainable development
Strategic focus areas	• Implement a continuous improvement process involving all Lisbon's key stakeholders • Improve energy and environmental performance of the city • Raise awareness for a responsible use of the city energy and environmental resources • Public sector • Transportation • Energy Efficiency
How is inteGRIDy relevant to your organisation	At the local level, Lisbon's Municipal Master Plan (PDM), provides the Energy-Environmental Strategy (developed by Lisboa E-Nova) and SEAP operationalization, fostering the adoption of good practices to promote a more sustainable performance of city neighbourhoods, based on a sustainable plans assessment through all its phases; more energy efficiency in public infrastructures, namely, street lighting, buildings or integration of renewable energy technologies. LISBOA E-NOVA also has a solid experience in the communication and citizen engagement area where it periodically organises communication events, such as workshops, exhibitions, technical visits, allowing for the dynamization of open dialogue platform between the citizen and the experts on a variety of themes related to energy and environment.

	inteGRIDy aims to integrate cutting-edge technologies, solutions and mechanisms in a scalable Cross-Functional Platform connecting energy networks with diverse stakeholders, facilitating optimal and dynamic operation of the Distribution Grid (DG), fostering the stability and coordination of distributed energy resources and enabling collaborative storage schemes within an increasing share of renewables. This integration applied in Lisbon pilot will benefit the Municipality and therefore, as a major associate member of the agency, will benefit Lisboa E-Nova reaching the targets proposed by its statutes and increase the experience in the area.
What content could be exploited?	LISBOA E-NOVA, as one of the responsible entities for the implementation of good practices in the energy and environmental management, will make use of inteGRIDy to enhance its portfolio in the Smart City area, allowing the Municipality and their key stakeholders to improve the knowledge in this field.
Approach to exploitation	LISBOA E-NOVA aims to provide their best contribution managing the Lisbon pilot providing all the data useful for the implantation of inteGRIDy's cross-functional modular platform (CMP). The collaborative development of such platform inside the project will provide important knowledge and know-how for the involved team as to apply the resultant methodologies to improve the Municipality Energy Efficiency and expand it to other key stakeholders. This will contribute in the future to implement an integrate city's energy management system.
Innovation category	• Products • Services • Prototypes • Software
Preferred commercialisation route (if applicable)	• Internal product development • Assignment of IP to third party • Licensing • Joint Venture • Spin off • Consultancy
Target users/customers	*Associates and companies based inside Lisbon Metropolitan Area*
Value proposition and key benefits of innovation	Energy Efficiency and reduction of greenhouse gas emissions towards a low carbon city
Potential impact on market	LISBOA E-ENOVA has the objective of providing the Municipality and the city population an Observatory where all the consumptions of the city can be displayed. This objective may influence the market at a national level since is an essential tool for the governance.

IPR Assessment	*No*
Detail action plan to achieve exploitation approach	The action plan to achieve exploitation will be: 1. Finalize all the use cases in the Lisbon pilot; 2. Compile all the data and analyse the results; 3. Share the good practices and lessons learned with the pilot and the project through the Lisboa E-Nova web page, social media, newsletter, conferences and members; 4. Spread the good practices with other Municipality buildings using the communication channels available in the Lisbon Energy Observatory web platform, show results through infographics and KPIs and spread good practices to apply in other buildings in the municipality.
Detail the strategies to exploit content	The technical solution adopted in the pilot will be benchmarked against other solutions in the market in order to clarify the current market maturity and enable Lisboa E-Nova to position itself in a stronger position to advise the municipality and its key stakeholders.
Will other inteGRIDy partner(s) be involved in the exploitation of this contents? If yes, then how?	*No*
Any other exploitable result (i.e. another product), which has been recognised as complementary, and thus might be marketed together with the described exploitable result under certain conditions.	*No*
Business model for the exploitable contents suitable	*No*

Public body

Partner	**IWC**
Organisation profile	The Isle of Wight Council (IWC) is a Unitary Authority which provides a wide range of services to a local population of 140,000 and some 5,000 businesses. It is the authority for highways, education, planning and licensing and provides social care services for adults and children. IWC is also responsible for strategic planning for the Isle of Wight and has produced "Eco Island" as its Sustainable Community Strategy. It is a vision for a low carbon community and for growth based on the development of the green economy. Specifically, Eco Island has targets for the Island to become self-sufficient in renewable electricity generation and to have the lowest per capita carbon footprint in England by 2020. IWC also has a broader vision of sustainability, focused on the Island's ecological footprint, and are working with the local community to make the Isle of Wight the first sustainable region in the UK. The council also has a priority for economic development and encourages investments which create skilled jobs, training opportunities and wealth. The renewable energy sector has been a focus for the council and the Isle of Wight is now home to a number of world class clean tech companies. There has also been significant investment in renewable energy generation, covering PV, energy from waste and tidal energy technologies.
Value proposition	• Stated commitment to sustainability • Delivered numerous low-carbon projects • Close relationship with Distribution Network Operator (SSEN)
Strategic focus areas (within Eco-Island Sustainable Community Strategy)	• Thriving Island • Healthy and Supportive Island • Safe and Well-kept Island • Inspiring Island.
How is inteGRIDy relevant to your organisation	The council has a strategic objective to have the smallest carbon footprint in England by 2020. It aims to achieve this through; the adoption of smart technology; improvements in the delivery of public services; and behavioural change amongst residents and the business community. The further development of distributed generation is reliant on overcoming the current grid constraints and the development of a future energy network is therefore referenced in the council's Economic Development Plan. inteGRIDy's core aims of integrate cutting-edge technologies and software to optimise the operation of the Distribution Grid are closely aligned to the councils. The Island will directly benefit from greater integration of distributed energy resources and the greater penetration of low carbon transport.

What content could be exploited?	The CMP could be exploited by both the DNO and micro-grid operators that may emerge in coming years as the network is opened up to greater flexibility and new operating models. The council will exploit the simulation model to understand the network impacts of large-scale investment programmes, such as EV charging point installation, the electrification of heating and the integration of storage technologies. Individual technologies being developed by inteGRIDy partners will also be examined to assess their usefulness to the council and other organisations as they begin to explore opportunities to provide grid-balancing services.
Approach to exploitation	The council will seek further engagement with the DNO so that it understands the concept and practical application of the CMP. It also intends to disseminate information to all UK DNOs through either a conference or webinar and will discuss options with the Electricity Networks Association (ENA). The council will also seek opportunities to showcase technologies being developed by project partners to both the public and private sectors.
Innovation category	• Products • Services • Prototypes • Software
Preferred commercialisation route (if applicable)	• Internal product development • Assignment of IP to third party • Licensing • Joint Venture • Spin off • Consultancy
Target users/customers	Initially end user customers are likely to be social housing and build to let clients. The eventual aim is to sell the 'energy as a service' service to all both commercial and residential customers. The target users are the researchers and solution developers.
Value proposition and key benefits of innovation	Low cost energy combined with demand response revenues - i.e. the ability to exploit variable electricity prices. The researchers can assess the behaviour of the electric network, or to schedule the loads and the generators, or to test the control algorithm on the model of the electric network.
Potential impact on market	The concept of energy as a service has a profound impact on the market. Minus7 is an enabling technology and is potentially one of

	a number of solutions that can support this market. We intend to be first there. A solution developer can assess the impact of his solution on the electric network.
IPR Assessment	*No*
Detail action plan to achieve exploitation approach	IWC meets regularly with the DNO and will continue to keep it abreast of inteGRIDy developments. It will also liaise with the Electricity Networks Association (ENA) which is managing the DNO/DSO transition through the Open Networks Project. It will discuss suitable opportunities to disseminate inteGRIDy results to network operators at a time when the inteGRIDy platform is more developed, most likely in year 4. Information on partner's technologies will be disseminated through media releases one they are producing tangible results and the council will host visits and open days for third parties to view those technologies that are installed on council sites.
Detail the strategies to exploit content	The council is exploring the concept of Citizen Energy Communities (CEC) through which a community owned ESCO could take a more active role in the energy system. The CEC could invest in DG, facilitate peer-to-peer trading, provide aggregator service and, potentially, own and operate parts of the electricity network. A CEC that provided flexibility services and/or network operation would be interested in a platform that provided intelligent network control, in particular, aspects of forecasting, prediction, grid control, flexible tariffs, demand response and dispatch.
Will other inteGRIDy partner(s) be involved in the exploitation of this contents? If yes, then how?	Once the functions of the CEC have been determined, the council will review all the products provided by partners and use cases in inteGRIDy to understand which could be combined to deliver the functions most effectively. Other project partners will also be invited to help disseminate results to UK network operators, once it has been determined which products are most useful for the DNO/DSO transition.
Any other exploitable result (i.e. another product), which has been recognised as complementary, and thus might be marketed together with the described exploitable result under certain conditions.	*No*
Business model for the exploitable contents suitable	Work on the business model to date did not consider the concept of a Citizen Energy Community, although it did anticipate a community-orientated organisation (e.g. ESCO) which sits at the centre of the energy system and performs multiple functions. It is likely that the business model will need further revision as flexibility services in

	generation-constrained areas become available and value pools in the local energy system are identified.

ANNEX II. Pilot Site Exploitation plans

Project wide measures

The inteGRIDy project is supporting exploitation of the project outputs through the development of robust strategy and by providing support to each pilot site to ensure the success of their exploitation activities. This enables them to develop pilot level exploitation strategy that would allow them to commercialise and protect their innovations.

This section provides steps on how the pilot site would approach the exploitation of their exploitable results.

Pilot site exploitation plans

These templates provide the InteGRIDy project integrated exploitation plans for each pilot site. The pilot has been grouped in line with the original proposal:

- **Pilot 1 – Isle of Wight (UK):** Smart Grid fleet Charging EV Facilities, Demand Side Response & Energy Storage.
- **Pilot 2 – Terni (IT):** Combining Smarter Decentralized MV/LV Automation with Local Coordinated DER-DSO Operation for improving Grid Optimization.
- **Pilot 3 – S. Severino Marche (IT):** Advanced DG Monitoring Power Flows Forecasting & Topology Optimization.
- **Pilot 4 – Barcelona (ES):** Smart Grid Integration, self-consumption strategies & enlarged RES penetration factor
- **Pilot 5 – St Jean Maurienne (FR):** Novel Demand Response & Virtual Energy Storage Schemes.
- **Pilot 6 – Nicosia (CY):** Coordinated DR and DSM at Academic Campus and Households with RES & CHP
- **Pilot 7 – Lisbon (PT):** DR in Municipal Buildings integrating PV, EVs and Thermal Storage.
- **Pilot 8 – Xanthi (GR):** Optimum Distributed Control of RES-enabled Islanded Grids Local Storage.
- **Pilot 9 – Ploiesti (RO):** Intelligent Energy Demand and Supply Matching feat innovative simulation & command-control for energy grids.
- Pilot 10 – Thessaloniki (GR): Flexible DR at Residential and Tertiary Building with Local Storage.

The preliminary pilot exploitation plan template consists of three sections with five different sub-sections, which each pilot is required to complete. The first five set of question is aimed at highlighting the pilot site developments;

- Pilot brief description
- Pilot value proposition
- Pilot strategic focus area(s)
- An overview of the pilot exploitable content
- A short description of the pilot approach to exploitation

The second set of questions in this exploitation plan explores the pilot site readiness level, and each pilot is required to complete five additional sections. These are:

- Pilot Innovation category

- Pilot Commercialisation route
- Pilot Target users/customers
- Key benefits of Pilot value proposition
- Pilot solution potential impact on market

Pilots exploitation details

Pilot – 1	Isle of Wight (UK)
1. Pilot brief description	The Isle of Wight Council (IWC) has an ambition to be self-sufficient in electricity produced from local renewable energy sources. This will require an installed capacity of RES in excess of 170MW. To date, approximately 80MW has been installed, but the Island is now subject to a grid constraint caused by the large amount of connected DG. This adds cost and complexity to new generation projects, with impacts on the economy and environmental targets. Reinforcement through an additional interconnector to the mainland is unaffordable and potentially unachievable; therefore, IWC is investigating smarter solutions which will allow it to achieve its ambitions and future-proof the electricity network. The Isle of Wight partners are contributing to smart grid solutions through field trials of thermo-storage facilities, EV charging stations for rapid charging that can also help in balancing the network, and Building Energy Management Systems that enable DSR delivery. The pilot will also develop a detailed model of the existing power grid, with an optimum smart gird architecture. The pilot is also exploring new models for community led DSR delivery.
2. Pilot value proposition	The Isle of Wight Council (IWC) is exploring the concept of a community owned ESCO that could take a more active role in the energy system. The ESCO could invest in DG, facilitate peer-to-peer trading, provide aggregator services and, potentially, operate parts of the electricity network. An ESCO that provided flexibility services and/or network operation would be interested in a platform that provided intelligent network control, in particular, aspects of forecasting, prediction, grid control, flexible tariffs, demand response and dispatch. Individual technologies being developed by inteGRIDy partners will also be examined to assess their usefulness to the council and other organisations as they begin to explore opportunities to provide grid-balancing services.

	The energy industry is rapidly evolving and as an OEM Siemens must conduct a process of continual research and development. As one of Europe's leading smart grid projects, InteGRIDy will provide key learning for how to integrate its cutting-edge technologies in order to optimise the operation of the distribution grid and deepen the penetration of distributed energy resources and storage. Consequently, it is very relevant to Siemens' current business model and will provide intelligence on a number of matters such as the market environment, regulatory context and technological framework. Siemens is seeking to adopt new service orientated commercial models and be actively involved in technological disruption, therefore InteGRIDY will also produce some significant insight into emerging business model innovation across Europe. The M7 heating system provides low cost energy combined with demand response revenues - i.e. the ability to exploit variable electricity prices. EMSc will provide convenient rapid charging of EVs, with reduced grid reliance (reducing connection costs/grid stress) and increasing renewable integration. The system also enables further benefits such as the Inclusion of energy trading and grid demand response services when the storage asset is not in use. UNEW researchers can assess the behaviour of the electricity network, scheduling loads and generation, or testing control algorithms on the model of the electric network.
3. Pilot strategic focus area(s)	• DSR • E-mobility • Thermal storage • Grid modelling
4. Overview of the pilot exploitable content	The CMP could be exploited by both the DNO and micro-grid operators (including an Isle of Wight community ESCO) that may emerge in coming years as the network is opened up to greater flexibility and new operating models. The simulation model could be used to understand the network impacts of large-scale investment programmes, such as EV charging point installation, the electrification of heating and the integration of storage technologies. Individual technologies being developed by inteGRIDy partners - SIE, M7 and EMSc - will provide grid-balancing services in the housing, commercial and mobility sectors.

5. Pilot approach to exploitation	PILOT - The council will seek further engagement with the DNO so that the network operator understands the concept and practical application of the CMP. It also intends to disseminate information to all UK DNOs through either a conference or webinar and will discuss options with the Electricity Networks Association (ENA). The council will also seek opportunities to showcase technologies being developed by project partners to both the public and private sectors. As work on the community ESCO develops, the council will assess the suitability of the CMP to provide the management of grid services. Siemens will generate significant knowledge and insight through its involvement in InteGRIDy. The policy review will produce much learning on the regulatory environment that exists across different territories within Europe. Also, its contribution towards the cyber security framework will engender it with practical lessons that can be applied on other projects. The main exploitable content for Siemens will be the work on the Isle of Wight pilot, where it is deploying a novel system to offer greater flexibility to the DNO. The innovation can be summarised in three points: 1. We will provide new and innovative demand side management strategies that enable live bureau market participation. The building owner/operators will be able to reduce hedging commitments and overall energy consumption whilst increasing the flexibility in line with grid operator requirements. 2. Inside the building we are deploying high numbers of sensors and other field devices that will enable us to increase the size of flexible load and participate in more demand response events. 3. Introducing an array of sensors to improve the process of aggregating load across multiple buildings. EMSc will utilise the Pilot to assist in optimisation of a Charging/DSR/renewable integration business case, outside of laboratory/test scenarios. The output of this will assist in the business case (reducing risks and improving confidence in bankability of the solution) and potential sales of the solution. The demonstration site will also be utilised for client visits and marketing events.
4. Pilot innovation category	*Please delete as appropriate:* • Products

	• Services • ~~Prototypes~~ • Software SIE – Services, Product M7 – Product and Services EMS – Products, Services and Software UNEW – Software CERTH – Software
5. Pilot commercialisation route (if applicable)	*Please delete as appropriate:* • Internal product development • Assignment of IP to third party • Licensing • ~~Joint Venture~~ • ~~Spin off~~ • ~~Consultancy~~ PILOT – N/A SIE – Licensing M7 – Internal product development and exploitation. We will initially sell the service ourselves. But our ideal exploitation route is to partner with an energy retailer. EMS – Internal product development. The Virtue EV system will be sold as complete system with scheduled/autonomous use throughout the day. EMS will sell the system as part of a solution around EV infrastructure for I&C clients.

	UNEW – Assignment of IP to third party CERTH – Assignment of IP to third party
6. Pilot targeted users/customers	For the Isle of Wight partners as a whole, targeted users for the platform are existing DNOs and micro-grid operators. The emergence of new models for delivery of distribution network services through a community ESCO will provide a potential market. The SIE system will target building owner/operators who will be able to reduce hedging commitments and overall energy consumption whilst increasing the flexibility in line with grid operator requirements. M7 customers are likely to be social housing providers and build to let clients initially. The eventual aim is to sell 'energy as a service' to owners and operators of commercial and residential buildings. EMSc are targeting larger industrial and commercial clients looking to electrify larger vehicle fleets. They are specifically looking at limited grid supply sites where storage would assist in reducing the need for grid re – enforcement, as well as provide revenues and renewable management, in order to assist in EV business case. For UNEW the target users are researchers and solution developers and for CERTH the target users are researchers and grid facilities managers
7. Key benefits of Pilot value proposition	The CMP could provide a cost-effective solution for grid and grid services' management whilst meeting the security and response requirements of the incumbent network operator. The SIE technology will provide new and innovative demand side management strategies that enable live bureau market participation. The building owner/operators will be able to reduce hedging commitments and overall energy consumption whilst increasing the flexibility in line with grid operator requirements. Inside the building they are deploying high numbers of sensors and other field devices that will enable an increase the size of flexible load and participate in more demand response events.

	The sensors to improve the process of aggregating load across multiple buildings. The M7 system provides the ability to exploit variable electricity prices providing low cost energy combined with demand response revenues. The EMSc system can potentially reduce the cost of implementing high-power demand EV networks. This can increase the utilisation of renewables, while actively decreasing the utilisation of the national grid. An additional benefit is the monetisation of EV charging systems, through use of storage, through arbitrage/energy trading/DSR. UNEW's work provides researchers with the ability to assess the behaviour of the electric network, or to schedule the loads and the generators, or to test the control algorithm on the model of the electric network. CERTH's software allows researchers and facilities manager to explore the potentiality of introducing hydrogen systems onto the grid and observe the benefits by performing multiple simulation tests.
8. Pilot solution potential impact on market	The CMP has the potential to allow the market entry of 'independent DSOs' and ESCOs that are looking to engage across generation, distribution and supply. The SIE solution can revolutionise the current building owner operator's energy model by leveraging new technology and accompanying services including key building baseline data, forecasting, modelling and Demand Side Response to enhance grid optimisation and flexibility. This can lead to suitable grid optimisation which has the potential to lower CO2 output and reduce the need for expensive grid reinforcement. For M7, the concept of 'energy as a service' has a profound impact on the market. M7 provides an enabling technology for 'energy as a service' and they intend to be the first to market. EMSc's system will help to stimulate the uptake of electric vehicles by the industrial and commercial sector, as well assist in the general business case of demand side flexibility and renewable generation control and optimisation.

	Utilising the UNEW system, a solution developer can assess the impact of his solution on the electricity network and the CERTH solution provides optimal design of hydrogen systems in order to improve efficiency of the grid.
9. Pilot IPR Assessment	*Are you generating any new intellectual property on InteGRIDy?* The following partners have indicated that they are generating new intellectual property: SIE – Yes and ongoing M7 – Yes – the remote control of heat pumps combined with thermal energy storage has a patent application pending. Its development is part of the InteGRIDy project. EMS – Yes – power flow control strategy and algorithm i.e. EMS. UNEW – N/A CERTH – No

Pilot – 3	**S. Severino Marche (IT)**
1. Pilot brief description	The pilot project is related to the distribution grid of San Severino Marche which is managed by the local distribution system operator A.S.SE.M SpA. San Severino Marche is a small town in in the Macerata province, in the center of Italy. The total area of the municipality of San Severino Marche is around 193 square kilometres and the number of populations is 13 thousand inhabitants. The territory consists of the city center and a rural area that is quite extensive but not very well served by the communication networks managed by the sector operators. The total length of medium voltage grid is 180 km and the operation voltage is 20 kV. According to the data updated to April 2019, the number of users connected to the distribution network is 7886 with a power available of 46.94 MW, 403 production plants with a power of 27.66 MW are also connected. The main types of generators are photovoltaic and hydroelectric flowing water and to a small extent cogeneration and wind. The primary substation of the grid is located in Colotto, a hamlet of San

	Severino Marche. Two transformers are placed in the primary substation and five feeders are connected to each of them.
2. Pilot value proposition	The goals of the pilot are related to the advanced monitoring of the grid, to the forecast of the power flows and, consequently, to the day ahead topology optimization of the grid. In this Pilot, the DSO of the area coordinates all the activities and be in charge of the apparatus deployment, the data gathering and the effective management of the test on medium voltage distribution grid. Then, the innovative algorithms devoted to optimizing the grid topology and the energy storage management have been developed, in order to monitor users' behaviour and to provide forecast of the power injections.
3. Pilot strategic focus area(s)	Smart cities and communities Smart Grid concept Mobile energy storage Distributed generation technology Renewable energy sources
4. Overview of the pilot exploitable content	Effective management of the DG and the maximization of the hosting capacity. Moreover, changing the topology of the grid in order to obtain an optimal configuration, in terms of losses or other operational indicators (Quality of Service, Hosting Capacity, etc.) is another exploitable content.
5. Pilot approach to exploitation	ASSEM SPA coordinates all the activities and be in charge of the device deployment, the data gathering and the effective management of the test on medium voltage distribution grid. POLIMI develops the innovative algorithms devoted to optimizing the grid topology and the energy storage management, in order to monitor user's behaviour and to provide forecast of the power injections. Moreover, UNE s.r.l. develops the innovative energy storage system.
6. Pilot innovation category	*Please delete as appropriate:* ~~• Products~~ • Services • Prototypes • Software
7. Pilot commercialisation route (if applicable)	*Please delete as appropriate:* ~~• Internal product development~~ ~~• Assignment of IP to third party~~ • Licensing

	• Joint Venture • ~~Spin off~~ • ~~Consultancy~~
8. Pilot targeted users/customers	Power plants, final users (passive) and the electrical grid.
9. Key benefits of Pilot value proposition	The focus is on an innovative approach to the monitoring and control of the distribution grid. The benefits of the innovation rely on the implementation of the proposed control logics in equipment, deployed in a real-life distribution grid. The final goal is to foster both the evolution of the regulatory framework in Italy and the development of commercial product capable to effectively operate in the new Smart Grid scenarios.
10. Pilot solution potential impact on market	New approaches such as control logics as it was mentioned before will be implemented and tested in order to properly manage the MV distribution grid. The Pilot will impact on a HV/MV distribution grid. Results could be duplicated over 2000 HV/MV substations in place in Italy. Similarly, in the project a new approach for the coordination of many Battery Energy Storage Systems (deployed in Low Voltage users' premises) will be developed and tested. In the new ancillary services market, a new actor, commonly named aggregator, will be in charge of coordinating all these resources. The control logics developed will results to be a term of reference for the retailers willing to act as an aggregator in the Italian Market.
11. Pilot IPR Assessment	The project will be evaluated adopting quantitative technical indices.

	Pilot – 6	Nicosia (CY)
1	Pilot brief description	The Cyprus pilot will test two different pilot cases. The first one regards the microgrid within the campus of University of Cyprus (UCY) in Nicosia city, while the second one regards dispersed prosumers within the Cyprus island. The selected prosumers have a photovoltaic (PV) installation with two separate smart metering infrastructures, in order to have access both to production and consumption data. They have been selected to be in the district area of Nicosia and Larnaca. These two different sites have been proposed for reasons of having different weather conditions, while being close to UCY. Furthermore, the selected prosumers are not supplied by the same distribution feeder. The impact of the proposed solutions to a single feeder of the electrical grid will be examined within the university microgrid test case. The University of Cyprus is selected as a pilot site, since it is in the transformation phase to become a "living lab". Currently, more than 400 kWp PV are installed both on rooftops and in terrain. Furthermore, many buildings within the university campus have Building Energy Management Systems (BEMS) for controlling the heating/cooling needs. For the next years, a large PV park (10 MWp) and a battery storage bank (1 MWh) are going to be installed within the university campus, enabling the microgrid operation. The monitoring of the microgrid will be carried out through sensors and advanced smart metering infrastructure, placed in several nodes within the campus. A single point of collecting the measurements and take the respective control decisions is needed.
2	Pilot value proposition	• World-class learning environment from teaching and research • Deep sustainable energy expertise and capabilities • Dedicated facility for energy research and development Energy Community Build & Operate Solution helps energy communities (i.e. commercial entities, industrial zones, local communities) to minimize energy costs by utilizing local energy resources & benefits of synergies. Can generate flexibility as an add on trading commodity.
3	Pilot strategic focus area(s)	• Sustainable Energy research and development • Cultural, social and economic development of Cyprus • Establishment of facilities for transforming the university into a green campus with microgrid controls for effective energy and demand side management. • Establishing affiliations with European, Middle East and worldwide Universities
4	Overview of the pilot exploitable content	UCY as a pioneer in the research field will utilize the cross-functional platform provided within inteGRIDy to increase the energy efficiency within the university campus. By activating the identified control points within the campus, the microgrid concept will be implemented. The target is to transform the University of Cyprus into a "living laboratory", which will use its own RES production to cover the electricity needs. The

		architecture so developed is applicable as an Energy Community in all commercial and industrial controlled areas DSO will take advantage of the controllable microgrid and the controllable prosumers within Cyprus to solve grid issues (such as violations of the voltage profile, grid congestion issues, power quality deterioration, etc.).
5	Pilot approach to exploitation	The cross-functional platform of inteGRIDy will be utilized to combine all the information provided by the smart metering infrastructure (for RES production, energy storage and energy consumption) and installed sensor systems within the university campus microgrid with the forecasted energy. The target is to increase the controllability of the microgrid to increase the efficiency in the energy flows. The platform provided by inteGRIDy will be utilized by the dispersed prosumers to offer ancillary services to the DSO through the controllable demand response. The DSO will use the controllability of both the microgrid and the dispersed prosumers to resolve the above referred grid issues.
6	Pilot innovation category	*Please delete as appropriate:* • Services
7	Pilot commercialisation route (if applicable)	*Please delete as appropriate:* • Consultancy
8	Pilot targeted users/customers	• DSOs, • commercial and / or industrial complexes that can act as a single point of common coupling to the local grid • prosumers.
9	Key benefits of Pilot value proposition	• Maximise the benefits of using dynamic tariffs for minimising the cost of energy to the end user. • Quantify the Demand Response capabilities of the commercial / industrial entity or aggregated prosumers and offer it to as flexibility to the DSO for managing grid needs: voltage profile, congestion, quality of supply etc • Identify demand management efficiencies for reducing consumption and hence less euros and less CO2 emissions.
10	Pilot solution potential impact on market	Strengthen the position of end users through the use of the inteGRIDy functional modular platform for improved efficiencies, trading flexibility and capitalising on the opportunities offered by dynamic tariffs. The portfolio of aggregators is enriched offering added benefits to the end users through their collective effort. Energy communities can identify valuable best practice approaches for managing their energy sources / needs.

11 Pilot IPR Assessment	No new IPR

Pilot – 7	Lisbon (PT)
1. Pilot brief description	The Lisbon pilot takes place in a municipal building, Campo Grande 25, that houses most part of the municipality's administrative personnel. In this building, a DR strategy will be implemented through an Energy Management System, integrating PV production on the building rooftop, EV charging and Thermal Storage. The Municipality is interested in reducing its electricity bill. To achieve this, different approaches will be studied. Firstly, the dynamic tariffs combined with the demand side management to associate bigger loads to low priced tariff times will enable savings. The demand side management (load shifting) will be achieved using the ice banks to produce ice or scheduling the EV charging periods to match low price periods of the dynamic tariffs. The electric energy generated through the small PV plant to be installed at the rooftop will also enable to reduce the grid load, leading to savings.
2. Pilot value proposition	The Lisbon Pilot will develop a BEMS that will allow the building manager to assess the current energy consumption from different loads, to see the production and forecast from the PV plant and then to manage the usage of some equipment, like the EV chargers and/or the ice banks, in the more adequate schedule, reducing energy consumption and energy bill.
3. Pilot strategic focus area(s)	• Implement a continuous improvement process involving key stakeholders • Improve energy and environmental performance of the building • Increase Energy Efficiency
4. Overview of the pilot exploitable content	The exploitable content in the pilot is the BEMS product itself which although not being explored in the context of the pilot, since it is delivered by one of the partners, could be exploited in equivalent market scenarios.

5. Pilot approach to exploitation	The Lisbon Pilot results may encourage the implementation of a BEMS in other Municipality buildings adapting for the type of equipment existing in each site. Not all the buildings have space in the roof to install PV or have EV chargers and specially don't have ice banks, like in the pilot site. However, the demand and response principles for the use of electric energy may be replicated in other buildings reaching positive results with energy consumption savings.
6. Pilot innovation category	*Please delete as appropriate:* • Products • ~~Services~~ • ~~Prototypes~~ • Software
7. Pilot commercialisation route (if applicable)	The pilot won't be commercialized. ~~*Please delete as appropriate:*~~ ~~I. Internal product development~~ ~~II. Assignment of IP to third party~~ ~~III. Licensing~~ ~~IV. Joint Venture~~ ~~V. Spin off~~ VI. ~~Consultancy~~
8. Pilot targeted users/customers	Facility manager of entities interested in having better control on their electric consumption with a DR system designed to maximize the building's energy efficiency
9. Key benefits of Pilot value proposition	Decrease energy consumption, CO_2 emissions and energy bills increasing energy efficiency
10. Pilot solution potential impact on market	Demonstrating the feasibility and impacts of such a BEMS could influence other building owners or managers to reach out to market.
11. Pilot IPR Assessment	All pilot data belongs to the Municipality of Lisbon and may only be used inside inteGRIDy consortium

Pilot – 8	**Xanthi (GR)**
1. Pilot brief description	At Sunlight premises an islanded smart microgrid network operates that fulfils local load demand. The grid consists of three

	nodes, where each of them constitutes of a smaller microgrid, that are connected together through a common DC bus. Each microgrid consists of equipment exploiting various RES, a local load, a battery and a diesel generator. The nodes are powered by PV and Wind Generators (WG). One of the nodes has hydrogen generation infrastructure from PV and a Fuel Cell that consumes the hydrogen upon demand based on the status of the other subsystems. The electrical topology is complemented by communication and automation infrastructure which leads to the formation of the smart grid and facilitates the decision-making process for the exchange of energy among the systems. Besides the local data acquisition systems, an interoperable SCADA system exists that monitors and manages the power exchange at the network.
2. Pilot value proposition	• customized turn-key solutions that cover the high demand energy needs of various sectors • wide range of products and services to meet energy sector requirements
3. Pilot strategic focus area(s)	• Infiltrate into the energy sector • Undertake and extend energy management of isolated or inaccessible areas or systems • Definition of business models for future energy storage potential • Exploit the developed innovative software for optimal energy distribution and monitoring.
4. Overview of the pilot exploitable content	SUNLIGHT and CERTH/CPERI will make use of inteGRIDy outcomes on Energy Power Systems and Green Energy Systems and optimal management and monitoring systems. The products may be enhanced with third parties technology in order to provide integrated systems.
5. Pilot approach to exploitation	An isolated autonomous grid operates for experimental purposes on Energy Power Systems and Green Energy Systems, at the industrial Renewable Energy park at Xanthi, Greece. The energy sources of the grid are sun, wind and diesel. Lead-acid batteries and Polymer Electrolyte Membrane (PEM) electrolyser that produces, and stores hydrogen are used for energy storage. In collaboration with CERTH/CPERI with expertise into process design and implementation, the focus is to provide tools in order to maximize the efficiency of the Energy Power Systems and Green Energy Systems in order to create technologically advanced and competitive products. Furthermore, inteGRIDy gives the opportunity to learn more about legal, political, technological and economical condition in most of European countries. This knowledge helps us to improve our business and marketing model in European countries and moreover, to understand better the needs of our customers.

6. Pilot innovation category	*Please delete as appropriate:* • Products • • • Software
7. Pilot commercialisation route (if applicable)	*Please delete as appropriate:* • Internal product development • • • • •
8. Pilot targeted users/customers	The main target users are, i. Isolated communities like small islands not connected to mainland's grid ii. Refugee camps iii. Remote telecommunication facilities and scientific outposts iv. Energy companies providing micro-grid services v. Remote facilities
9. Key benefits of Pilot value proposition	The main goal is to maximize the efficiency of Energy Systems that are using multiple energy sources. The deployed tools provide online information about the status of the energy sources and the load demand. It provides integrated solutions for online optimum decision making for energy distribution in isolated smart grids including batteries charging for EVs. i. Increase the controllability of the energy production, consumption and storage ii. Optimize the energy distribution in the grid iii. Provide tools for optimized management of the network
10. Pilot solution potential impact on market	• Promotes the use of hybrid systems that are using multiple energy sources and storage solutions as microgrids. • Increases the efficiency of existing microgrid systems by applying an intelligent management system. • Exploits the results of the pilot operation in order to improve the design of new microgrid systems

11. Pilot IPR Assessment	Tools are developed and applied in this Pilot by CERTH and Sunlight. IPR belongs and remains to both CERTH and Sunlight.

Pilot – 9	Ploiesti (RO)
1. Pilot brief description	Ploiesti Pilot aims to implement a Demand Response system (EIIS - Energy Integrated Information System) where building energy management and control systems can operate based on critical peak pricing and intelligent DR programs/algorithms. The main goals of this solution are to: • Monitor and control how to operate DR programs in order to decrease the peak of power consumption. • Engage consumers in DR programs testing and validating the concept of a DSO as a user of demand-side flexibility. • Increase flexibility of energy consumption (behaviour changes). • Implement specific DR intelligent algorithms. • Provide trade flexibility solutions with consumers.
2. Pilot value proposition	The value propositions of Ploiesti Pilot are practically the value propositions specific to the implemented EIIS solution/product, namely: • Intelligent measuring / modelling / monitoring (smart algorithms and innovative customized modules) • DSO – oriented solution (focused on the DSO' demands and benefits) • Consumer profile driven solution • Centred on the consumption optimization and efficiency • Alerts and notifications • Based on innovative technologies and open architecture capable to integrate both realistic data and data provided by simulation programs/applications/tools • Capability to validate various flexible business models, compliant with the specific of the targeted market.
3. Pilot strategic focus area(s)	• Developing *an innovative infrastructure* (smartening the grid) to ensure the monitoring and optimization of energy consumption (operational) • Ensuring a *Demand Response Smart Grid* for residential areas, where the buildings' energy management and control system function based on intelligent DR algorithms (operational) • Ensuring *a better forecast of the energy consumption and energy losses* (operational) • Validating *the most appropriate business models* for the pilot, based on a rigorous analysis of various business models / patterns specific for the energy sector (business)

4. Overview of the pilot exploitable content	Both ELECTRICA and SIVECO are interested in exploiting the results of Ploiesti Pilot (pilot exploitable content) and fostering the innovative solution replicability, as follows: • ELECTRICA, as a large Romanian DSO, will use the pilot exploitable content to improve the services provided and to provide innovative energy distribution services packages, compliant with the market demand • SIVECO, as an IT leading company and technological partner, will use the pilot exploitable content to develop new business models and to attract clients / partners from energy distribution.
5. Pilot approach to exploitation	ELECTRICA and SIVECO have a common approach regarding the exploitation of the pilot results, namely: • Using the huge amount of knowledge and know-how in developing similar solutions / projects • The resultant methodologies will be used in internal research and innovation assets aiming at developing new business models to access new markets • Fostering replicability of the solution (EIIS) implemented • Validating the most suitable business models and preparing new packs of energy services for the market.
6. Pilot innovation category	• Products (EIIS - Energy Integrated Information System) • Services • Software (e.g. smart DR algorithms, software applications/components)
7. Pilot commercialisation route (if applicable)	• Internal product development • Assignment of IP to third party (B2B) • Licensing • Joint Venture • Consultancy
8. Pilot targeted users/customers	Based on the proposed business models, the pilot targeted users/customers are: iii. DSOs iv. Public Utility companies v. Electricity suppliers vi. Consumers (B2B2C)

9. Key benefits of Pilot value proposition	The key benefits of Pilot value proposition are the following: • Optimizing the energy consumption • Costs reduction, energy savings • Consumers can track and manage their consumption • Consumers can make informed decisions • Empowering the staff of the DSOs, Public Utility companies, electricity suppliers • Ensuring a better forecast of the energy consumption and energy losses • Ensuring the process transparency and the clarity of roles and responsibilities (DSO).
10. Pilot solution potential impact on market	The proposed list of Value Propositions represents the base of the exploitation strategy, given that it is used to understand the target users / customers' needs and the benefits offered by the Pilot solution. The purpose of implementing the EIIS (Energy Integrated Information System) within the Ploiesti Pilot is to ensure a Demand Response Smart Grid for a residential area, where the buildings' energy management and control system will function based on intelligent DR algorithms. After the assessment of the Pilot outcomes, similar solutions to the one tested / validated in the project would be applied for residential buildings/areas on a larger scale. Our goal is to replicate and deploy similar DR solutions in other residential areas, including not only residential buildings, but also other types of commercial surfaces (shops, malls, offices). In order to evaluate the potential impact on market, specific studies and prospects on the targeted market will be achieved. The analysis of EIIS as marketable solution / product will be based on USP (Unique Selling Proposition or Unique Selling Point) marketing approach, addressing the distinctive advantages of the solution against similar Smart Metering solutions / platforms existing on the Romanian market. The competitive advantages will be determined through a benchmarking analysis. The Pilot solution potential impact on market also implies a rigorous analysis of different business models / patterns specific for the energy sector (e.g. Pay-per-Use, Smart Metering, Software Applications, Value-Added Enabler, ...) and a proposal of the most appropriate business models for the pilot, focused on attracting clients from energy distribution on the Romanian market.
11. Pilot IPR Assessment	The specific agreement between SIVECO and ELECTRICA regarding the Pilot IPR Assessment will generate a new intellectual property on EIIS (Energy Integrated Information System) and will respect the stipulations of the IPR Agreement

	concerning the relations between ELECTRICA - SIVECO and the other members of the Consortium during the commercialization of inteGRIDy platform.

Pilot – 12	Thessaloniki (GR)
1. Pilot brief description	The Thessaloniki pilot will mainly focus on the demonstration and assessment of different Demand Response techniques and the sustainability of related business models offered from a utility provider /ESCO company to residential consumers (not prosumers) and commercial customers. In both cases, the utilization of Battery Energy Storage Systems (BESSs) will also be evaluated. The provision of the latter will be made by SUNLIGHT (Energy Storage manufacturing industry - consortium member). The demonstration will take place in residential and commercial buildings in the metropolitan area of Thessaloniki, in northern Greece. All the participating buildings are part of WATT+VOLT customer portfolio (Greek Energy Utility - consortium partner).
2. Pilot value proposition	• Strong partnerships with Inter- and National Industry, • Strong knowledge of the Greek Electricity Market, • Close partnerships between Research Centers, industry and utility providers • Participation of consumers in implicit, or explicit Demand Response programs • Integration of BESS in either Residential, or Commercial buildings for reducing electricity bill. • Providing flexibility services to Distribution System Operator through a utility provider/aggregator (WATT+VOLT)
3. Pilot strategic focus area(s)	• Information Computer Technologies and Services referring to Demand-Side Management. • Load Flexibility offered to Distribution System Operator. • Battery Energy Storage Systems (Residential or Commercial buildings) • Dynamic Pricing Business Models on large scale BESS implementation • Wholesale Energy Market flexibility approach
4. Overview of the pilot exploitable content	• Software components and ICT services developed by CERTH (forecasting modules, scheduling optimisation engine, Incentivised and active DR engine etc.) • Know-how, customer contact and approach along with Demand Response programs as services offered by WATT+VOLT to potential Customers. • Product provision and appropriate services from BESS provider SUNLIGHT (Consortium member) • “Turn Key” Service solution provider from customer acquisition to energy efficiency services by WATT+VOLT

5. Pilot approach to exploitation	Knowledge-sharing/intellectual activities: CERTH institute involved in Thessaloniki Pilot (CERTH/ITI and CERTH/CPERI) plan to additionally exploit the outcomes of inteGRIDy project to the wider scientific community, by preparing and submitting to journals and conferences, papers relevant to the occupancy flow modelling and prediction techniques, multi-sensorial networks and occupancy-based demand side management. Further contributions to the wider-scientific community will be provided by diffusing the novel algorithms and techniques that were applied in the inteGRIDy framework. Regarding the prototypes that will be designed and developed for the different frameworks' modules (etc.), it will jointly collaborate with involved partners for the delivery of corresponding prototypes with corresponding licenses to the associated scientific community. Research Activities: CERTH is expected to gain valuable knowledge and experience in aspects such as integrative modelling combining technical and business models, energy efficiency and knowledge management. Therefore, as a research institute, will further reuse and exploit know-how, algorithms and tools resulting from the project to future R&D initiatives. Towards this direction, the aim is to provide and develop even more results, robust algorithms, open models etc. Business Activities: CERTH/ITI is a research institute that is non-profitable and targets to knowledge dissemination and expansion. However, CERTH/ITI institute holds active collaborations with SMEs and the energy industry in Greece and in European level. CERTH/ITI will also investigate the creation of spin-off companies oriented in commercializing products derived from the above research and the participation in new spin-off commercial companies capable of exploiting its research when new market needs and solutions are identified. CERTH/CPERI will further seek exploitation through the Clean Energy Ltd. spin-off company already established. WATT+VOLT Exploitation Segmentation: • Large Industrial Companies: WVT has a large sample of industrial customers providing energy on several industry sectors. Actions should take place on these customers demonstrating the inteGRIDy approach. • DSO and Utilities Market: WVT is taking part (in some cases as a central speaker as well) in several workshops and conferences for energy in Greece and EU, where DSO, TSO

	and Utilities are joining. Therefore, the inteGRIDy approach should be communicated forward. • Household and SME: WVT is introducing now over 30 retail stores all over Greece, where the household users as well as SME' are visiting on Monthly Basis, where the inteGRIDy progress and results could be easily exploited. The exploitation of the target group will be carried out individually by WVT for its customers. In addition, Sunlight, as an Industrial partner, may include the outcomes of the pilot in a product which will be promoted in commercial fairs and tradeshows.
6. Pilot innovation category	*Please delete as appropriate:* ~~i. Products~~ ii. Services iii. Prototypes iv. Software
7. Pilot commercialisation route (if applicable)	*Please delete as appropriate:* i. Internal product development ~~ii. Assignment of IP to third party~~ ~~iii. Licensing~~ ~~iv. Joint Venture~~ v. Spin off vi. Consultancy
8. Pilot targeted users/customers	• Utility companies and Retailers already offering or targeting to enter advanced DR services, such as WATT+VOLT Utility/Retailer in Greece (already a consortium partner) • Energy companies targeting to offer micro-grid services • Batteries manufacturers (as in the case of Sunlight Company in Greece, which is also a consortium partner), targeting optimal dimensioning and expected dynamic response under fluctuating conditions. • Grid operators interested in the case of decentralized energy systems (as for example the case of islands). For example, PPC and HEDNO could include such contacts, with whom CERTH collaborates in numerous services, offers and R&D projects. • Micro-grid owners targeting optimal operation scheme for existing configuration

	• Stand alone or grid connected energy systems integrators who will incorporate in the design a battery storage system.
9. Key benefits of Pilot value proposition	• Optimised DR services, targeting both residential pro/consumer and tertiary buildings/customers • Efficient energy management (such as Green economy, Reduced carbon emissions, Decreased energy costs for the end users/customers) • Model representation of the dynamic operation of PVs, heat pumps and battery storage solutions, integrated on a detached and or district level, for simulation purposes. • Efficient management of grid assets and identification of best practices for the provision of main and ancillary services (e.g. frequency and voltage control) • Minimize generation capacity requirements by implementing energy storage systems (ESSs) to shift the load profile.
10. Pilot solution potential impact on market	• Balancing of the grid through DR (peak reduction/shaving, load shifting, ancillary services) • Increment of Renewable Energy Systems utilization and energy storage systems utilization • Shift towards renewable fuels (e.g. hydrogen) production, storage and usage as energy source • More cost-efficient services to prosumers • Optimal dimensioning and design of PV, heat pumps, battery storage systems, for smart grid operation, both in the case of RES energy harvesting and storage • Nothing to add
11. Pilot IPR Assessment	For all tools developed by CERTH, WATT+VOLT or SUNLIGHT, IPR belongs and remains to corresponding partners respectively.

http://www.inteGRIDy.eu