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DELIVERABLE D10.3
Exploitation and Business Innovation Plan v1

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Executive Summary

The deliverable D10.3 Exploitation and Business Innovation Plan v1 is developed within the activities of task 10.3: *Business Innovation planning for project results* to define the PARITY exploitable results and to design a prosperous exploitation strategy during and after the project completion. The deliverable is the first version of PARITY Exploitation and Business Innovation Plan and presents the approach and the measurers applied towards the commercialization of PARITY products and services, along with the highest potential exploitation routes. Furthermore, the methodology to analyse the project Key exploitable Results, aiming to provide the distinctive assets of the generated innovations and the value-offered to intended customers, based on their needs and expectations.

In parallel, the deliverable presents a brief definition of PARITY solution components and a preliminary selection of IPR protection tools and the methodology to define the IPR management strategy and the potential joint ownership schemas among consortium partners. The design of a Business Innovation Plan for PARITY solution and the Key Exploitable results will offer the go-to-market strategy, showing the deployment phases and the operational resources to bring PARITY into the Local Flexibility market and the energy sector.

Finally, in the last chapter of the deliverable, all partners are providing the Individual Exploitation Plans regarding the project results, aiming to achieve the highest impact by the generated tangible and intangible assets of PARITY project.

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List of Acronyms and Abbreviations

Term	Description
APIs	Application Programming Interface
DER	Distributed Energy Resource
DSO	Distribution system operators
EU	European Union
EV	Electric Vehicles
GA	Grand Agreement
G2V	Grid-to-Vehicle
IoT	Internet of Things
IPR	Intellectual Property Rights
KER	Key Exploitable Result
LFM	Local Flexibility Markets
LV	Low Voltage
P2P	Peer to peer
PQ	Power Quality
RES	Renewable Energy Sources
SWOT	Strength, Weakness, Opportunity, Threats
TRL	Technology Readiness Level
V2G	Vehicle-to-Grid
WP	Work package

1. INTRODUCTION

1.1 Scope and Objectives of the Deliverable

PARITY vision is to deliver a transactive flexibility framework that addresses the "structural inertia" of existing distribution grids and will increase the durability and the efficiency of electricity grid, while enabling the adoption of Renewable Energy Sources (RES). PARITY will go beyond the traditional to-down grid management and develop a unique local flexibility market platform through the integration of IoT and blockchain technologies and the delivery of smart-contracts, aiming to facilitate efficient and transparent local flexibility transactions and reward flexibility in a cost-reflective and symmetric manner. This will be achieved with price signals of higher spatio-temporal granularity based on real-time grid operational constraints and available DER flexibility. With the deployment of state-of-the-art IoT technologies, PARITY will offer distributed intelligence (DER profiling) and self-learning/self-organization capabilities (automated real-time distributed control), orchestrated by cost reflective flexibility market signals generated by the blockchain Local Flexibility Market platform (LFM platform). Within PARITY, DERs will form dynamic clusters that essentially comprise self-organized networks of active DER nodes that will efficiently distribute and balance global and local intelligence, enabling real-time aggregated & P2P transactions through enhanced forecasting, optimization and control of DER flexibility. Finally, PARITY solution includes novel tools for Active Network Management, including an innovative STATCOM and PQ monitoring device, that will enable the DSO to enhance its management capabilities, grid observability and RES hosting capacity.

The developed technologies and tools will be demonstrated and validated in four pilot sites with varying characteristics in terms of climatic zones, proliferation of RES and demand device types, regulatory frameworks and market codes as well as culture and environmental consciousness. The sites are located in Granada, Spain; Athens, Greece; Malmö, Sweden and Massagno, Switzerland.

The deliverable D10.3 Exploitation and Business Innovation Plan v.1 is the outcome of task 10.3: Business Innovation planning for project results and the deployment of activities to establish the exploitation route that defines the management and the promotion of project exploitable results. The deliverable is a first report of PARITY Exploitation and Business innovation plan and includes the definition of appropriate measures and the methodologies that are deployed for project results exploitation and the Intellectual Property Rights management. Furthermore, the methodology to design a concrete commercialization strategy for the developed products and the description of the strategic tools applied, including a marketing plan, a go-to-market strategy, operation plans, financial analysis and post-funded needs.

The exploitation plan of PARITY's tangible and intangible outcomes is focusing on generating benefit or making use of these and create an impact during and after the funded activity is completed by maximising the created value. The exploitation of results can be direct by the consortium partners and indirect, by transferring results to other entities, upon agreements. Within PARITY Exploitation and Business innovation Plan, various options will be investigated in the areas of developing commercial product and services, the use of results in further research activities and the potential inclusion in standardisation activities. The Business Innovation Plan will determine the activities for the commercialisation phase that will follow the project completion. The definition of the Intellectual Property Rights ownership and management is also an important element, ensuring that all project results are formulated and complied into a protectable form with the appropriate IPR protection tools.

1.2 Structure of the Deliverable

The structure of the current document is designed with an introductory first chapter and three sections to present the detailed approach for the definition of PARITY Key Exploitable results and Exploitation & Business Innovation Plan. The first part of the deliverable includes the methodology and the tools used for the definition and the analysis of PARITY exploitable assets and the definition of PARITY solution as integrated offering. This includes a description of the innovations generated and the key characteristics of the distinctive assets that create an advancement towards other available solutions.

The second part of the deliverable consists of the methodology and the measures to define the PARITY Exploitation and Business Innovation plan and the key target market segments. The third part includes the methodology to develop IPR management strategy and the selected protection tools, along with the Individual Exploitation Plans for project results.

1.3 Relation to Other Tasks and Deliverables

The development of PARITY Exploitation and Business Innovation Plan is linked to various of WP activities' outcomes and it is a living document in relation to the project maturity phase. A final version is expected to be shaped at the end of the project activities with the creation of D10.6: Exploitation and Business Innovation plan v2 (M42).

The documents that feed the design of PARITY Exploitation and Business Innovation Plan are described below:

- D3.1 PARITY Business use cases & Requirements: Main user requirements, expectations and business scenarios
- D3.5 PARITY System Architecture: A description of system architecture and PARITY framework operation.
- D4.4. Local Flexibility Market Actors Business Models: Presentation of the business Models for each actor that is participating in the Local Flexibility Market framework
- D5.2 Market Models and Flexibility routes: Market pricing mechanisms and the flexibility monetization schemes applied into the Local Flexibility Market
- D5.4 Smart Contracts: Smart contracts and specification
- D9.1 Living Lab activities: Planning and deployment of Living lab activities
- D9.2 Dissemination and Communication Plan
- D9.5 Report on grid integration and standardization recommendations for Local Flexibility Market: Grid integrations and standardization recommendations
- T10.1Market Intelligence on LFM tools and systems: Market analysis of Local Flexibility Market
- T10.2 Evaluation and assessment of Business viability of LFM actors: Validation results of LFM related business models and viability

2. PARITY KEY EXPLOITABLE RESULTS

2.1 Methodology to analyse PARITY Key Exploitable Results

Following to the definition[1] of project results/foregrounds that are derived by an EU funded activity, these are "any tangible and intangible output of the activity, such as data, knowledge and information, whatever their form or nature, whether or not they can be protected, which are generated in the action, as well as any attached rights and intellectual property rights". Project results include intellectual property rights (e.g. copyrights, industrial designs, patents, plant variety rights), similar forms of protection (e.g. rights for databases) and unprotected know-how (e.g. confidential material). Furthermore, the project outcomes are considered to become reusable entities or elements and potentially contribute to further work, research activities or innovations development.

The PARITY solution includes the development of innovative tools that enable the integration of end-users in Local Flexibility Markets and provide flexibility to DSOs needs. These are expected to reach different technology readiness levels (TRL) and are brought together to formulate the PARITY tool suite which includes:

- Smart Contract Enabled Local Flexibility Market Framework
- Smart Contract Enabled IoT Gateway
- Building-As-A-Battery management algorithms
- PARITY Smart Grid Monitoring and Control algorithms and STATCOM
- EV Profiling & Geo-Charging Services algorithms

The methodology designed to analyse PARITY exploitable components (Figure1) will be applied at an individual level and at the form of the project's Key Exploitable Results (KER), aiming to identify the key characteristics towards their commercialisation. For the characterization of the exploitable results all PARITY partners will contribute to a series of activities ranging from the definition of the project's Key Exploitable Results to the identification to the highest potential ones and the possible risks for their further development.

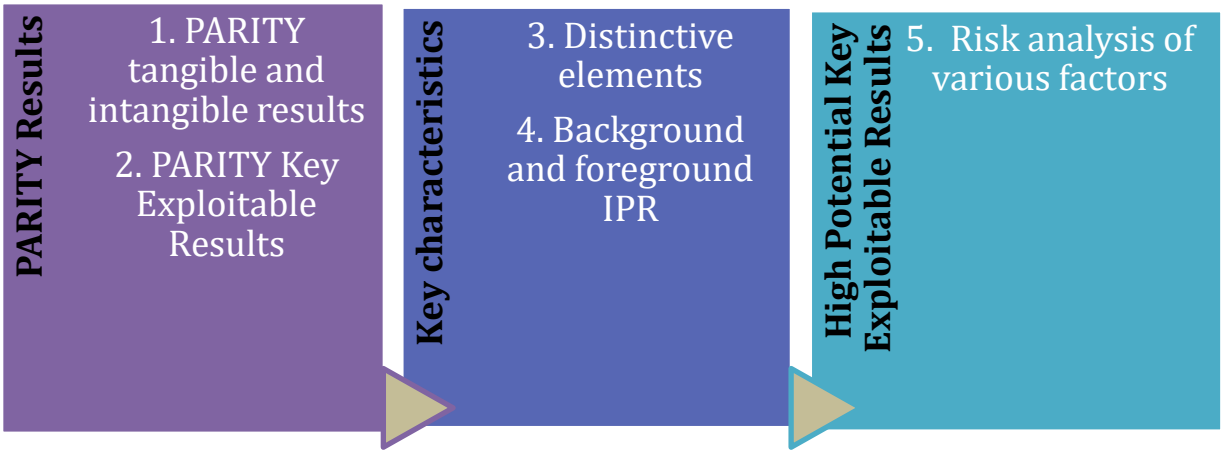

Figure 1. Definition of Key Exploitable Results methodology

The definition of all PARITY project results includes all tangible and intangible assets that constitute the PARITY solution. These range from the software and the hardware that form PARITY tools suite, the knowledge and the developed services offered to key stakeholders, the development of novel Business Models to be applied in the LFM sector, the databases and the created processes.

The definition of PARITY exploitable assets is built on the input received by all technology partners and the development of a survey consisting of three parts: the first is focused on the results' type, the second is related to the distinctive assets and the third is dedicated to the IPR definition.

Part 1: Exploitable Result type

- ⇒ Exploitable Result: Definition of the exploitable results and short description of the offered solution
- ⇒ Owner: Who is the owner of the developed result
- ⇒ Type of result: Definition of the result type: tangible and intangible (software, hardware, services, data, knowledge, process, network, information, other)
- ⇒ TRL level: Definition of the expected Technology Readiness Level
- ⇒ Contributing schema: Definition of the partners involved in the development of the result

Part 2: Distinctive assets

- ⇒ Problem solved: Definition of the current problem that potential customers and users are facing and will be addressed with the developed result
- ⇒ Alternative solutions: Description of the current alternative solutions to the problem identified
- ⇒ Distinctive advantage: Definition of the characteristics that form the distinctive advantage and the unique selling point of the developed result
- ⇒ Added-Value: Definition of the added-value offered by the developed technology to the potential users and customers
- ⇒ Potential customers: Description of the intended customer segments and the different users of the result
- ⇒ Target markets: Definition of the primary and secondary market segments that each result will be launched
- ⇒ Competitors: Definition of the key competitive solutions
- ⇒ Strength and weakness: Description of the characteristic that define strength and weak point of the result

Part 3: Intellectual Property Rights

- ⇒ IPR protection tool: Selection of the intellectual property right tool of the technology (patent, trademark, trade secret, copyright, industrial design, utility model, database, domain name, geographical indicator, other)
- ⇒ Monetisation route: Definition of potential monetization option of the developed result (License, by IP owner, through assignments, by business partnerships, Joint Venture, Spin-off, IP elements in contracts, other)
- ⇒ Background information to the project: Each partner describes the background brought to the project, related to the already provided input in the CA.

Following the definition and the analysis of PARITY tangible and intangible results, the formation of Key Exploitable Results, as joint entities, will take place with a collaborative workshop and with the involvement of all consortium partners. The Key Exploitable results (KERs) of the project are the outputs that have been developed and validated during the project, as the highest potential exploitation entities. These derive from the project Use cases and the Business Model definition, as these are defined up to the current phase of the project. The KERs will be the main elements of PARITY Business Innovation Plan, analysing the product and services development and its commercialisation phases, to launch a prosperous offering to Local Energy communities and Local Flexibility Market sector.

Furthermore, the Joint ownership schemas among technological developers, will be shaped and further analysed to conclude in mutual agreements among involved partners.

For the identification of the KERs with the highest exploitation potential, a risk analysis will be carried out including the examination of various factors that might affect the commercialisation of the results. An evaluation matrix of risk factors will support our analysis and these include: Partnership factors, technological Risk factors, market characteristic and trends, regulatory issues IPR issues and financial risks.

For the analysis and the definition of the Key Exploitable results, the PARITY consortium is planning to benefit from the European Commission consulting services of HORIZON RESULTS BOOSTER[2]. The first session in the exploitation plan activities is the Module C: "Guidance and training to improve the existing project strategies of projects towards effective exploitation of key exploitable results. The exploitation strategy will improve the following aspects: review of the key exploitable results of the project; revise, complement and clarify existing exploitation plans of project results and/or outline exploitation paths of results; techniques to identify all relevant stakeholders in the exploitation value chain; support to perform a risk analysis related to the exploitation of results."

2.2 Parity Key Exploitable results

Currently, the tangible and intangible results by the consortium partners are defined and briefly presented in the table below (Table 1). Their detailed analysis regarding the distinctive/innovation characteristics, target customers, value offered and current problem solved is deployed and all insights are a critical input to the definition of PARITY exploitation strategy. These are incorporated to PARITY Exploitation plan and will be presented at their final version in D10.6: Exploitation and Business Innovation plan v2 (M42).

Table 1. PARITY tangible and intangible results

PARITY result	Owners	Description	Result type	Target TRL
G2V and V2G flexibility module	SUPSI and CERTH	A software module which can to estimate the flexibility provided by a fleet of EV	Software	5
STATCOM optimal placement tool	CIRCE	This tool can choose the best location (from a technical/economic point of view.) for a STATCOM in a real LV distribution grid	Algorithm / software	7-8
STATCOM hardware	CIRCE	This device contributes to the loss reduction stability and control of the grid through power balancing and voltage regulation, among other functions.	Hardware / software	7
Network status detection tool	CIRCE	This tool is used to estimate the status of the grid, according to a classical traffic light approach, in different time horizons (real or near-real time, intraday, day-ahead) and classify the severity of possible events that may occur.	Algorithm / software	6-7
ANM tool (active network management tool)	CIRCE	This tool that can calculate set points for DERs (in real-time or near-real-time) to avoid or at least reduce possible issues in LV grids.	Algorithm / software	6-7

PARITY result	Owners	Description	Result type	Target TRL
Business consultancy services	e7	Based on the knowledge generated in PARITY, consultancy services can be provided to interested market actors such as energy retailers, facility managers etc. on how to get involved in business opportunities in the field of local energy/flexibility trading, demand response and energy communities.	Service, knowledge	No TRL
Policy consultancy services	e7	Policy makers and regulatory bodies on national level can be offered consultancy services especially for the implementation of EU directives (e.g. Renewable Energy Directive and Internal Electricity Market Directive). Based on experiences in the PARITY project, advise on innovative aspects (such as P2P trading, dynamic grid tariffs or flexibility procurement at DSO level) can be prepared to facilitate viable, effective and efficient decisions.	Service, knowledge	No TRL
Stationary Battery Manager	CWATT	This result is based on the module developed within PARITY that manages each BESS and integrate them with an aggregators portfolio.	Software, knowledge	9
VPP Flexibility Manager	CWATT	This result covers integration of heterogeneous DER within a unifies flexibility management network, or simply a virtual power plant.	Software, services, network	6
Aggregator integration with LFM platform	CWATT	Besides the individual modules and components developed within PARITY, experience with integration is a valuable and exploitable result. For an aggregator, having integrated internal tools with a market platform like the PARITY LFM is one tangible example.	Knowledge, process	4
Aggregator to Prosumer UI	CWATT	PARITY involves integration of a highly diversified DER portfolio into a unified system. Involving the prosumer is a challenging but crucial task and an exploitable result within a business setting.	Software, services	7
Aggregator Toolset	CERTH	Integrated software tool for automated management and optimization of aggregated flexibility, including a user interface, available to Aggregators to increase benefit of prosumers and DSO.	Software	8
EV profiling and EV charging platform	CERTH	Software tool for optimizing operation of EV chargers by adapting schedule / charging mode to provide flexibility by taking into account also the V2G concept. EVs are considered as flexible loads for the benefit of prosumer (owner) and DSO (flexibility buyer).	Software	8

PARITY result	Owners	Description	Result type	Target TRL
Blockchain / off-chain APIs	CERTH	Data formats and APIs for use in Blockchain applications in the scope of LFMs, facilitating secure data exchange and storage.	Software, services	8
LFM Market Intelligence	University of Nicosia (UNIC)	A thorough analysis of the energy market related to the PARITY products, and especially to the LFM tools and systems. Alternative use cases and market opportunities are investigated to identify segments of interest for individual PARITY components.	Knowledge and information report	2
Consumption data at real time.	Aggregator (URBENER SL)	Consumption data at real time (no defined frequency yet) per individual loads (HVAC, DHW, lighting).	Data	7
Pilot plant exploitation (algorithm and infrastructure) of flexibility market trading at commercial buildings.	Aggregator (URBENER SL)	The flexibility algorithm will trade automatically in the flexibility market based at consumption time data recorded of the installation.	Knowledge, services	7
Pilot plant exploitation (algorithm and infrastructure) of optimal consumption at commercial buildings.	Aggregator (URBENER SL)	The optimal consumption algorithm will adjust automatically individual loads consumption time data based in energy prize signals.	Knowledge, services	7
Storage-as-a-service framework in the form of a battery solution	E.ON customers	The battery solution will be capable of load shifting to assist with self-consumption, peak-shaving to decrease power tariffs in Sweden and reduce the need for larger fuses, as well as enable trading on local and national ancillary markets via a VPP.	Hardware + software + services	9
VPP integration into existing ancillary market trading framework	E.ON	DER and EV charging flexibility will be pooled and integrated into E.ON's existing trading services via a VPP which will be developed as part of PARITY by CheckWatt.	Services + software + process	9
Validating a unified flexibility management framework at	E.ON	Validating the DER flexibility ecosystem integrating heterogeneous DER within a unified flexibility management framework – with relation to the Swedish market.	Knowledge + services	5

PARITY result	Owners	Description	Result type	Target TRL
the Swedish pilot sites				
Local Flexibility Market	HIVE POWER	The setup of a generic local flexibility market, addressing several use cases, powered by the blockchain technology for the security and the automation of processes.	software	6
IoT Platform	Hypertech	IoT Platform will be based on the existing Hypertech's Information Management Layer technology and will be enhanced throughout the project to facilitate data collection from buildings.	hardware	8
Building-as-a-Battery (BaaB)	Hypertech	Building-as-a-Battery corresponds to a high innovative module which utilizes the flexibility from thermostatically control loads in conjunction with flexibility from stationary batteries comprising the virtual and the actual energy storage systems respectively.	software	8

2.3 Parity solution

The electricity distribution network is currently going through profound changes/transformations in the context of decarbonizing the energy system in an attempt to limit the ambient temperature increase to well below 2^{o}C compared to pre-industrial levels. Those changes, ranging for large amounts of (distributed) renewable energy resources to large-scale electrification of end-uses, are creating operational constraints for the distribution grid.

The ultimate goal of the PARITY project is to develop the main framework under which local flexibility markets can operate effectively and in a transparent and prosumer-friendly manner in order to offer services to Distribution System Operators (DSOs) to alleviate some of the aforementioned operational constraints.

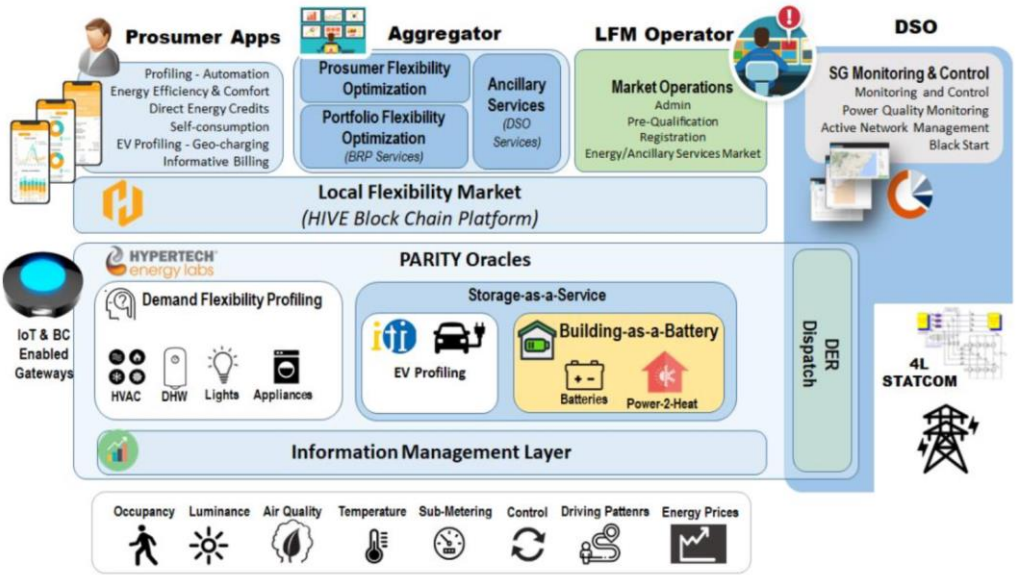

Figure 2. PARITY solution

The project goes beyond the development of such an operating framework; a complete set of tools and offerings, i.e., looking at the whole local flexibility market / stakeholder ecosystem (Figure 2), is investigated, developed and trialed/validated through the project. More specifically, the following technology solutions are going to be proven through pilot trials in four different countries (Spain, Greece, Sweden and Switzerland):

- A local flexibility market (LFM) platform, enabling transparent and secure energy transactions among members/prosumers at a local level ('peer-to-peer' transactions), as well as service offerings to energy actors beyond prosumers (e.g., aggregators, DSOs, energy retailers, etc.), based on a set of comprehensive smart contracts tailored to each type of transaction and safeguarding the rights and preferences of relevant stakeholders (through carefully crafted Service Level Agreements), using blockchain technology.
- A set of Internet-of-Things (IoT) tools for the accurate estimation and forecasting of flexibility available from a range of distributed energy resources, such as flexible, controllable prosumer loads, like heat pumps and electric water heaters, also exploiting the thermal inertia of prosumer buildings, and electric vehicles. Tools for optimizing the deployment of demand response strategies will also be developed within the PARITY project.
- Software and hardware components (e.g., STATCOM) installed at the premises of DSOs (e.g. at distribution substations and control rooms), which increase the downstream network visibility and optimise the operation of distribution grids under conditions of increased variable RES generation connected at the MV and LV distribution network.

Emphasis is also given in creating value propositions for all involved stakeholders of the PARITY ecosystem, highlighting opportunities for cost-optimisations and benefits to stakeholders deriving from their participation in Local Energy Markets (LEMs)/LFMs.

Finally, to facilitate the participation of prosumers in demand response schemes through the LFM platform and allow them to have better visibility and control over their energy profiles, dedicated prosumer applications are going to be developed within the PARITY project.

3. EXPLOITATION AND BUSINESS INNOVATION PLAN

3.1 Methodology and definition of key target customer groups and target markets

The main beneficiaries of PARITY solution and the key stakeholders of the pilot sites involved, where initially defined at the beginning of the project and further confirmed during the development of Business Models, in task 4.4: Definition of business models for LFM actors. Two types of end-users have been identified: 1) the demand flexibility providers that consist of DER owners, residential energy consumers/prosumers, building residents and 2) the flexibility users related to their use of extracted demand flexibility that consists of aggregators, facility managers, energy retailers, DSOs, LFM coordinators, and DER network operators. Furthermore, the Local Electricity market Operator that operates Local electricity market and p2p trading activities and the Local Flexibility Market operator, for operating an explicit market platform.

The analysis of each targeted customer segment has provided the different added value that will be offered through PARITY tools and services. Energy prosumers will receive various benefits from reduced energy bills and a disposable income, through their active and transparent participation in flexibility markets and an increased energy autonomy by participating in the local energy communities. Aggregators will have the chance for new business cases, to support their sustainability in the smart grid era. DSOs will benefit by receiving cost-efficient flexibility sources that ensure the stability and reliability of energy networks without needed to invest in infrastructures. Retailers are participating in energy the market by purchasing energy and selling to customers, therefore have the contact point to end-users: consumer, therefore they are seeking innovative services to offer their customers and grow their market share. Moreover, the deployment of Living Lab workshops in the pilot sites, will enable a thorough analysis of each customer/end users segment and their needs to be addressed with PARITY products.

The target markets for PARITY LFM tools and services are being analysed within the task 10.1: Market Intelligence on LFM tools and systems. Therefore, the activities of task 10.3 are highly coupled with the outcomes provided in T10.1. Specifically, T10.1 is going to provide all the relevant background information related to market and interest segmentation, considering the motivations, demographics, and background of the target market, to help decide if the development initiative makes sense. Additionally, the market adoption roadmap provided in T10.1 is relevant for T10.3 for further exploitation steps, as it will provide information to customers and/or organizations which wish to adopt the PARITY offerings.

The investigation of market opportunities will identify the segments of interest for individual PARITY components and map the commercialization opportunities for PARITY and the challenges in energy market. The insights from market intelligent activities will be valuable input to evaluate the commercialization options of PARITY tools and define the successful go-to-market plan. More specifically the segments analysed are the: 1) Distributed Ledger Technologies (DLT) and Blockchain, 2) the Smart Distribution Systems and Distributed Energy Resources, 3) the Local Flexibility markets services and Local Energy communities, 4) the Smart Grid Monitoring and Management, 5) the IoT and Smart Contracts Enabled Energy Transactions, and 5) the DER Flexibility Profiling.

In addition to the customer segments of PARITY solution, each of the identified exploitable results of PARITY will target various market segments, as this is defined in Individual exploitation plans and presented in the table below (Table 2).

Table 2. PARITY target markets and customer segments

PARITY Exploitable Result	Target markets	Customer segments
G2V and V2G flexibility module	Grid management solutions that want to integrate the management of EV fleet in their palette of offerings	Power utilities that need to improve the management of their smart grids
STATCOM optimal placement tool	DSOs with a high DERs penetration and/or with unbalances in LV grids	DSOs
STATCOM hardware	DSOs with a high DERs penetration and/or with unbalances in LV grids	DSOs
Network status detection tool	DSOs with a high DERs penetration and/or with unbalances, voltages deviations or congestions in LV grids	DSOs
ANM tool (active network management tool)	DSOs with a high DERs penetration and/or with unbalances, voltages deviations or congestions in LV grids	DSOs
Business consultancy services	Energy retailers interested in getting involved in business opportunities in the field of energy communities Secondary: facility management enterprises, real estate developers, technology providers	Business consultancy services: traditional energy retailers/suppliers, facility management enterprises, real estate developers, technology providers
Policy consultancy services	Primary: policy makers (federal ministry) Secondary: executive regulatory bodies, stakeholder associations	Policy consultancy services: national federal ministry for energy and climate protection, national energy regulatory authority, stakeholder associations
Stationary Battery Manager	Stationary Battery Manager	BESS owners through BESS installers.
VPP Flexibility Manager	VPP Flexibility Manager	DER owners / prosumers
Aggregator integration with LFM platform	Aggregator integration with LFM platform	No direct customers (if not consulting aggregators and/or LFM operators)
Aggregator to Prosumer UI	Aggregator to Prosumer UI	Prosumers, possibly through installers of DER.
Aggregator Toolset	Local flexibility market	Aggregator, Aggregator's customers/prosumers
EV profiling and EV	Services provided to EV owners, EV charging infrastructure owners and managers	EV profiling and EV charging platform: EV charging owners

charging platform		companies (customer and users), EV owners (users)
Blockchain / off-chain APIs	Local Energy Market / Local Flexibility Market platform operators and developers	Blockchain / off-chain APIs: Any organization/company that can act as Local Market operator (customer and user), Aggregator (user), UI application developers (user)
LFM Market Intelligence	Energy market	Energy actors, policy makers, scientists, market analysts
Consumption data at real time.	PARITY tools are main base on residentials.	Flexibility prosumers (commercial, industrial and residentials) Aggregator, Retailer, energy communities.
Pilot plant exploitation of flexibility market trading at commercial buildings.		
Pilot plant exploitation of optimal consumption at commercial buildings.		
Storage-as-a-service framework in the form of a battery solution	Business, industry, and housing association customers looking at installing medium to large storage solutions in the form of smart battery systems	E.ON business customers either with or without already installed DER or looking to add a flexible storage innovation
Local Flexibility Market	The primary target is the Energy Supplier customers, which are more agile in adopting new technologies and using efficient solutions to be more competitive. The secondary target are DSOs and TSOs, which are typically more conservative.	Aggregators, such as Energy Suppliers, DSOs, TSOs and other companies that have a large base of customers and access to their flexible devices, such as electric vehicles
IoT Platform	Primary target market: - Demand response market - Future local flexibility markets (these markets are still in the stage of development) Secondary target market: - Ancillary services market	• Consumers and prosumers with the desire to be capable of monitoring, scheduling and configuring their energy-related appliances • Energy Retailers/suppliers to expand their energy tariff offerings and provide specific tailor-made energy-as-a-service strategies. • Aggregators aiming to increase their energy assets portfolio and participate in more DR campaigns.
Building-as-a-Battery (BaaB)		

		• Energy service companies (ESCOs) and Facility Manager aiming to provide to their customers personalized application. Energy Consultancy Agencies to provide big data analytics • VPP/Microgrid Operators. for energy management of a micro-scale portfolio.

Additional activities to market identification is the internal and external ecosystem investigation with the well-established market tool of SWOT analysis. This is a framework to assess the PARITY solution current position and what is the key strength and weakness elements of the tools, to make the proper decisions for the exploitation and Business Innovation Plan. Furthermore, to acknowledge the market opportunities and threats and create strategic paths to benefit from the market launch.

3.2 Monetisation and Exploitation Plan

This chapter presents the methodology to develop a concrete Exploitation and Business Innovation Plan for PARITY offerings as a whole and the Key exploitable results, aiming to address the needs of Local Flexibility Markets and energy sector. The Exploitation Plan of PARITY solution will be developed as part of the T10.3 activities to investigate the exploitation options that create value for the intended customer segments and the early adopters of the solution, during and after the funded activity completion. The methodology (figure 3) is applied in four areas and is an interrelated process of the following exploitation and commercialisation activities, starting with the definition of the project results, the shape of novel business models, its exploitation potential and the shape of IPR management strategy. The end-users and the customers are placed at the heart of this process by analysing their key characteristics and aiming to fulfil the different stakeholders' needs. The involvement of all key beneficiaries, including building occupants, will be in all stages of the project life-cycle innovation process, aiming the collaborative framework in the development of a local flexibility market ecosystem. The design of a PARITY Exploitation and Business Innovation plan includes periodically updates, following the progress level of the project and the demonstration activities at all pilot sites. Furthermore, the relation to other tasks is critical as the complementary activities realised to identify market needs and main trends.

For the development of PARITY Exploitation and Business Innovation plan, all partners are expected to actively contribute, either by providing their input on specific technologies or by offering their expertise and knowledge for identifying the market exploitation opportunities in Local energy communities sector, Smart grids and smart distribution field and Local Flexibility Markets.

Exploitation is a value-driven approach and is defined as *"the use of results in further research activities other than those covered by the action concerned, or in developing, creating and marketing a product or process, or in creating and providing a service, or in standardisation activities".* Exploitation can be deployed in different fields of commercial, societal and political or for improving the public knowledge.

Figure 3. PARITY Exploitation Plan methodology

Based on the maturity and the technology readiness level of PARITY tools and services, the exploitation plan will be designed and deployed at the areas of: **a commercial exploitation, a Scientific Exploitation and standardisation activities and the Intellectual Property Rights management.**

Therefore, the assessment of the potential exploitation route will be carried out with the involvement of consortium partners with the support of a questionnaire to acquire input. All parties, as exploitation implementing actors (individually or as a group), will provide their intentions regarding the potential direct and indirect use of the Key Exploitable results. This direct use includes the commercialization of results, a contract research for further research in external groups, participation in new research project and training courses, while indirect use refers to the IPR management as licensing, assignments, development of standardization actions, spin-off and other to consider.

1. **The commercial exploitation.**

At this level the PARITY Key Exploitable Results will be examined to become commercial entities as products and/or service, owned by consortium partners individually or by the formation of joint ownership entities. Some of the generated results will need to be further developed and mature, in regards to technological performance, applicability in real conditions and usage experience. The novel Business models will be translated into an exploitation opportunity, targeting the different customers segments at various touching points, based on their needs. The PARITY tools will be validated at the pilot site, and will evaluate the final form of tools and the services offered. A detailed presentation of the four business cases and the roles of the key stakeholders is included in D4.4. LFM actor models. Next, the early adopters of the PARITY solution and the Key Exploitable results will be defined and the establishment of potential relations to ensure the uptake of results after the project ends.

The exploitation activities will be developed through the Living Lab activities, as the touching point with the end-users and customers. During the designed workshops at pilot sites, the key beneficiaries involved in PARITY solution, will be the main focus to provide their input and expectations for the acquired services. A close collaboration among project partners and the end-users will be established to link the generated value from PARITY solution with real benefits to end-users. Furthermore, to create the space and the connections for the further exploitation and replication of PARITY results in the early adopter audience. All Living Lab actions are presented at deliverable *D9.1: Living Lab setup activities*.

2. The Scientific Exploitation.

At this level PARITY exploitable tangible and intangible results will be incorporated into dissemination activities to reach the scientific community and the academic field, with the goal to connect and collaborate with industry expects and create an impact to EU research and Innovation field. Furthermore, the development of standardisation activities is a main focus for the project exploitation strategy. The PARITY consortium partners aim to monitor and provide recommendations for standardised methods in grid management services and energy data, building on international standards. All activities will be summarised in D9.5: Report on grid integration and standardization recommendations for Local Flexibility Markets.

The form of a concrete dissemination plan is presented at D9.2: Dissemination and Communication Plan & Activities v1, consisting of scientific publications to share the innovations generated in PARITY, the participation of PARITY consortium members in industry events to present the PARITY solution and the collaboration with other initiatives in the sectors of Smart grids, Local Energy systems, energy market, Smart Power Electronics a.o. Furthermore, PARITY consortium will participate in activities to exchange information with BRIDGE working group that is created by European commission and Smart grids and Storage H2020 partners to define regulatory and legislative barriers, novel business models and to engage consumers/prosumers. A main element of the dissemination plan to direct target the key stakeholders, is the active presence to the highly impactful social media platform, sharing all the latest developments of the project and engaging the audience to raise the awareness for PARITY tools and solution.

3. Intellectual Property Rights management.

At this level, that is presented at the next chapter, the Intellectual Property of PARITY solution will be defined along with the ownership schemas for the exploitation of the results. Different forms of IPR commercialisation will be explored and the definition of IPR protection tools to form a prosperous IPR management strategy for the generated PARITY results. Consortium partners have applied for patents and trademarks as the suitable protection tools of the project results, to ensure the limitation of market penetration barriers due to conflicts with competitive offerings.

3.3 Business Innovation Plan

Business Innovation Plan will be developed in parallel to exploitation and will enable the implementation of activities to maximise the potential of PARITY solution into successful products according to market opportunities and the end-users needs. A concrete Business Innovation Plan for PARITY solution and the Key Exploitable Results consists of the go-to-market strategy through a specific timeplan and the definition of the roles of involved stakeholders. The formation of joint ownership entities and operational plans, will be stated with the attached agreements that are necessary to implementation.

Additionally, the definition of the actions regarding technical activities for prototypes and software interfaces, along with a financial implementation plan up to three years after the project completion. This includes the investigation of the investment needed, the possible funded activities and the design of the revenues stream potential among the selected monetization routes as the different licensing types, foreseen product sales or other use of project results. The IPR management strategy will provide valuable input to this activities, after the selection of the appropriate tools to ensure project results commercialisation.

Pricing mechanisms and product positioning will also be analysed with the use of well-established marketing tools to define the right price for the solution. A competition landscape analysis is also necessary to map any similar solutions to the market and their competitive characteristics. Technology watch activities will be deployed within T10.1 – Market Intelligence on LFM tools and systems to ensure that PARITY is an up-to-date solution with high distinctive innovative elements. The activities aim to maximize the impact of PARITY innovation, to minimize risk of investment by detecting possible

threats in advance and to identify new market trends and competitors. Following to the identification of early adopters, the examination of the suitable channels and the promotion strategy to reach them, will be designed aiming the establishment of prosperous relationships for the market launch of the results. At this point the key roles and the external collaborations needs to be shaped to ensure the implementation of activities.

PARITY consortium is planning to receive the European Commission services of the Horizon Results Booster, regarding the development of a Business Plan. This provides a customized training to develop a plan that includes all the above mentioned elements of market analysis, business strategy, operation plan, competitor identification and implementation plan. Another critical support to PARITY commercialization is the support in implementation in the aspects of:

- start-up operations (incubators, legal, administrative)
- investors (venture capitalists in the market sector, identification of business angel networks)
- funding (financial instruments for start-ups or new businesses from banks, local governments, national funding, identification of crowdfunding platforms and schemes)

The activities of Business Innovation Plan will be deployed throughout the project development and will be presented upon its completion, at D10.6 : Exploitation and business innovation plan v2.

4. IPR STRATEGY AND OWNERSHIP AGREEMENTS

4.1 IPR protection Tools

The Intellectually Property Rights are defined by European commission [3] as "the private legal rights that protect the creation of the human mind such as inventions, literary and artistic works, and symbols, names, images, and designs used in commerce". They are commonly divided into two categories:

- Industrial Property Rights (e.g. patents, trademarks, industrial designs, geographical indications) and
- Copyright and Related rights (e.g. rights of the authors/creators and those of performing artists in their performances, producers of phonograms in their recordings, and those of broadcasters in their radio and television programmes).

The Intellectual Property Rights for PARITY results will be analysed at this chapter, as a main part of the project's Exploitation plan. The D10.3 Exploitation and Business Innovation Plan-first version provides the methodology to define IPR strategy and the phases to conduct the IPR management strategy for the project's results. The background information, the access rights, the ownership of results and licensing options will be examined and presented at their final form at PARITY Exploitation and Business Innovation Plan-final version.

The principles for managing IPR in PARITY were presented and signed among consortium partners at the beginning of the project and are in line with H2020 IPR recommendation. These are stated in the Consortium Agreement, at chapter 4: RIGHTS AND OBLIGATIONS OF THE PARTIES and section 3: RIGHTS AND OBLIGATIONS RELATED TO BACKGROUND AND RESULTS. Each participant will own the foreground it generates and the background is clearly identified within the agreement along with the access rights specification. The preliminary form of the project IPR, is also covered at the Grand agreement Nr864319 at sections 2.2.1.7, as a property of PARITY consortium partners, individually or through the shape of a Joint ownership agreement that will be defined through mutual established terms. Furthermore, is clarified that project results capable of industrial or commercial application must be protected taking into account legitimate interests and any notice for dissemination should be provided beforehand to involved partners. Regarding access rights, the consortium partners may review the agreed access rights to background, upon request and with a mutual agreement if necessary for the project deployment.

Background information and access rights:

Background information of the project is any data, know-how or information, whatever its form or nature (tangible or intangible), including any rights such as intellectual property rights that are held by the beneficiaries before they acceded to the agreement and are needed to implement the action or exploit the results. Access rights' means the user rights to other partners' results or background and under the terms and conditions laid down in the consortium agreement. Access rights are valid upon written agreements and create a benefit from the collaborative resources. As defined at the initial stage of the project and through the GA Nr864319: "The partners are obliged to define the background needed in any manner, and may exclude specific background. At a preliminary stage, partners agreed on open access publishing, though in the future may opt for gold or green access to peer- reviewed scientific publications, which might result from the project, depending on the type of information to be published". Any updates of background and access rights will be periodically offered by the consortium partners that are proving these, or need access, through the questionnaires developed to support this work.

Ownership of the project results and IPR management

The Exploitation Plan of PARITY results includes the shaping of jointly owned entities that will be shaped among participants under mutual agreements. The IPR strategy and management will be formed initially by identifying the appropriated IPR protection tools for each developed result and by the owned organization. The optimum scenarios for PARITY exploitable results will be shaped into the IPR

management strategy, aiming to maximise the exploitation potential for tangible and intangible project outcomes and position of these ideas in the standardisation and commercialisation processes. Furthermore, the investigation of local IPR regulations will be carried out, to map any risks for future exploitation. The generated IPR will be considered as main element of the dissemination and exploitation activities during and after the project's completion. The IPR results of the project will be a property of the originating partners.

To support the successful exploitation of IPR strategy of project results, the European Commission provide various services and tools through the European IPR helpdesk[4] and the guidelines to identify the most suitable IPR protection tools and IPR commercialization strategies. The PARITY results will be protected through a selection of IPR protection tools that are commonly used in EU funded projects. Each of the tools are described below as these are defined by EU in the IP Helpdesk portal:

Table 3. IPR protection tools

IPR protection tool	Description	Period
Trademark	*The exclusive right over the use of a sign that is registered for products and services and make this a distinguishing sig of its characteristics, compared to competition. It offers territorial protection and protection of goods and services.* It can be registered: Nationally, Regionally: EU TradeMark- EUTM[5]) and Internationally: World Intellectual Property Organization (WIPO[6])	10 years
Industrial design	*The outward design of the whole part of a product, consist of lines, contours, colors, shape, texture and materials of the product or its ornamentation.* It can be registered Nationally, Regionally: Registered Community Design (RCD), Unregistered Community Design (UCD) and International route: the Hague System.	5 years.
Patent	*The exclusive rights granted for protecting inventions of products/processes that offer a new technical solution or a new the way of a process. The patent holder has the right to prevent third parties to use the invention for a limited period.* It can be registered Nationally, Regionally: European Patent Convention (EPC), European Patent Office (EPO), Internationally: the International Patent System- PCT[7]	20 years.
Utility model	*It is also referred as a 'petty model' and is the exclusive right for an invention which allows its owner to prevent others to use this, without the owner's authorization*. It can be registered nationally	7-10 years
Trade secret	*Is any business confidential information that is providing a competitive advantage for the organization and are usually included into non-disclosure agreements. It might be a know-how, technical knowledge, commercial data a.o.* This can be registered in all EU countries, under the unfair competition laws	unlimited period
Copyright	*Is the rights that creators have directly and automatically for a work.* There is no specific list of works that can be copyrighted but the most common types are: Literary work, computer programs, databases, films, artistic work, architecture, advertisement and technical drawings. Together with the work the phrase '"all rights reserved" or the symbol © is usually attached. Copyrights are nationally and territorial	unlimited period
Database	*Consists of a collection of independent works, or other materials arranged in a systematic way and individually accessible by electronic or other means. These are protected as copyrighted*	unlimited (for copyrighted

IPR protection tool	Description	Period
	databases and Sui generis [24] databases. Its registration is at a national level or with EU member states	databases) or for 15 years (Sui generis databases).
Domain name	*Is the name of an internet address, used for a web site and usually are indicative of the company name, or a trademark on the internet.* The registration is realized internationally under the Internet Corporation for Assigned Names and Numbers (ICANN)	15 years in annual terms
Geographical indicators	*It is a sign used on the products with a specific geographical origin and whose characteristic and/or reputation are attributable to that origin.* Their registration can be nationally, territorial or regional	up to its cancellation

During the project development and within the activities for shaping PARITY Exploitation and Business Innovation Plan, a detailed IPR catalogue will be formulated analyzing project results from the research activities, including all patents and other IPR tools per developed result and the licensing types. This will be periodically updated to reach its final form at the end of the project. The consortium partners will be responsible to define the IPR strategy type and the licensing types for the use and the exploitation of the developed technologies, at an individual level and as joint ownership entities for Key Exploitable Results. To co-ordinate this work, specific questionnaires will be developed and circulated to involved partners, as the base for collaborative discussions for Key Exploitable Results ownership.

Table 4. PARITY IPR protection tool

PARITY result	Owners	Result type	IPR protection tool	Monetisation route
G2V and V2G flexibility module	SUPSI and CERTH	Software	A piece of software is difficult and unlikely to be patented, but this is the main way to protect the IPR, if needed.	The algorithm can be implemented as a software as a service and offered as a plug-in component of an overarching solution to utilities based on STATCOM.
STATCOM optimal placement tool	CIRCE	Algorithm / software	under evaluation, such us patent, Industrial secret among others.	under revision
STATCOM hardware	CIRCE	Hardware / software	under evaluation, such us patent, Industrial secret among others.	under revision

PARITY result	Owners	Result type	IPR protection tool	Monetisation route
Network status detection tool	CIRCE	Algorithm / software	under evaluation, such us patent, Industrial secret among others.	under revision
ANM tool (active network management tool)	CIRCE	Algorithm / software	under evaluation, such us patent, Industrial secret among others.	under revision
Business consultancy services	e7	Service, knowledge	Publications highlighting copyright of information	Consultancy assignments
Policy consultancy services	e7	Service, knowledge	Publications highlighting copyright of information	Consultancy assignments
Stationary Battery Manager	CWATT	Software, knowledge	tbd	tbd
VPP Flexibility Manager	CWATT	Software, services, network	tbd	tbd
Aggregator integration with LFM platform	CWATT	Knowledge, process	tbd	tbd
Aggregator to Prosumer UI	CWATT	Software, services	tbd	tbd
Aggregator Toolset	CERTH	Software	Patent / Copyright	License / Business partnership
EV profiling and EV charging platform	CERTH	Software	Patent / Copyright	License / Business partnership
Blockchain / off-chain APIs	CERTH) HIVE, QUE	Software, services	Patent / Copyright	License / Business partnership
LFM Market Intelligence	University of Nicosia (UNIC)	Knowledge and information report	Copyright	PARITY Copyright (© PARITY. Copies of this publication – also of extracts thereof –

PARITY result	Owners	Result type	IPR protection tool	Monetisation route
				may only be made with reference to the publisher)
Consumption data at real time.	Aggregator (URBENER SL)	Data	trademark	License
Pilot plant exploitation (algorithm and infrastructure) of flexibility market trading at commercial buildings.	Aggregator (URBENER SL)	Knowledge, services	trademark	License
Pilot plant exploitation (algorithm and infrastructure) of optimal consumption at commercial buildings.	Aggregator (URBENER SL)	Knowledge, services	trademark	License
Storage-as-a-service framework in the form of a battery solution	E.ON customers	Hardware + software + services	None	Sale to E.ON's B2B customers
VPP integration into existing ancillary market trading framework	E.ON	Services + software + process	None	None
Validating a unified flexibility management framework at the Swedish pilot sites	E.ON	Knowledge + services	None	Joint Venture with other PARITY partners
Local Flexibility Market	HIVE POWER	software	The software could be patented if connected to specific devices	The software could be licensed as SaaS to potential customers.
IoT Platform	Hypertech	hardware	Propriety rights (background IPR)	Licence
Building-as-a-Battery (BaaB)	Hypertech	software	Propriety rights (background IPR)	Licence, Business partnerships, Joint Venture

The definition of IPR commercialization[8] model is the action of bringing IP to the market, aiming future profitability and business growth. The IP strategies can be commercialized: a) by the creator and

owner, b) by an IP assignment by transferring IPR from one party to another, c) by licensing with permitting other entities to use IP under specific terms and different licensing types, d) by the creation of Joint Ventures or spin-offs and e) by including IP in business contracts internal or external and for further development of the technologies, products and services. Based on PARITY Key Exploitable results potential for exploitation, the commercialization options will be analysed to define the concrete exploitation route after the funded activity along with the key stakeholders involved. The commercialisation of IPR by its owner, different licensing options and the possibility of shaping Joint Venture among consortium partners are the most dominant options to be further analysed.

License is the contract under which the holder of an 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. The business value created from the intellectual asset use, is by charging the licensee in return for this 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. A license can be exclusive where only the licensee is able to use the IPR and non-exclusive where IPR can be used by both parties or other organisations.

Following to the initial form of consortium agreement that includes all terms and principles for the collaboration of PARITY solution development and after the shaping of project Key Exploitable results, a memorandum of understanding(MOU) is expected to be shaped, as a pre-contract for the potential joint exploitation of results. The MOU will be signed by all involved partners to the integrated offering, in order to define the framework of negotiations and the terms for activities that include information exchange, ownership schemas, confidentiality issues and conditions for terminating the agreements. In addition, after the definition of the terms and the partners involved, the final co-operation agreement is expected to be shaped, related to work organization, liability and Intellectual property. A final form of agreement will be signed at the end of the project or upon its completion, leaded by the results owners, to finalise the collaborations of PARITY Key Exploitable results. The issues that will be addressed are regarding the existing IPR that are required for the collaboration, the new generated IPR, that are deriving from the common work, the IPR that might be produced outside the collaboration, but during the contractual period and the IPR that might be included to a technology transfer agreements.

5. INDIVIDUAL EXPLOITATION PLANS

Based on the current phase of the project, PARITY consortium partners have provided the Individual exploitation Plans for the developed results as presented in the table below. The final version will be included in D10.6 : Exploitation and business innovation plan v2.

5.1 ETHNIKO KENTRO EREVNAS KAI TECHNOLOGIKIS ANAPTYXIS (CERTH)

The Centre for Research and Technology Hellas (CERTH) is one of the largest research centres in Greece; top 1 in north Greece. It was founded in 2000 and is located in Thessaloniki. Its mission is to promote the triplet Research – Development – Innovation by conducting high quality research and developing innovative products and services while building strong partnerships with industry and strategic collaborations with academia and other research and technology organisations in Greece and abroad.

CERTH/ITI is one of the leading Institutions of Greece in the fields of Informatics, Telematics and Telecommunications, with long experience in numerous European and national R&D projects. It is active in a large number of application sectors (energy, buildings and construction, health, manufacturing, robotics, (cyber)security, transport, smart cities, space, agri-food, marine and blue growth, water, etc.) and technology areas such as data and visual analytics, data mining, machine and deep learning, virtual and augmented reality, image processing, computer and cognitive vision, human computer interaction, IoT and communication technologies, navigation technologies, cloud and computing technologies, distributed ledger technologies (blockchain), (semantic) interoperability, system integration, mobile and web applications, hardware design and development, smart grid technologies and solutions and social media analysis.

In PARITY project CERTH is developing the following tools:

Table 5. PARITY exploitable component/ CERTH

PARITY Tool	*OWNER*
Aggregator Toolset	CERTH
EV profiling and EV charging platform	CERTH
Blockchain / off-chain APIs	CERTH HIVE, QUE

CERTH will exploit the PARITY's results both directly and indirectly. A direct exploitation will be achieved by protecting the knowledge created by CERTH in the course of the project (foreground knowledge) through e.g. by 1 patent or copyright and granting licenses for its use or collaboration with industry. Indirect exploitation may be realised by increasing CERTH's leadership in the respective technology areas of research (EV charging profiling, AI algorithms, blockchain, etc.) on a European scale. CERTH expects that the technologies validated under PARITY will attract the interest of relevant enterprises and can initiate new collaborations with industrial partners towards technology transfer and commercialisation. CERTH exploits tools/algorithms through spin-off or royalties with third parties.

5.2 Centro de Investigación de Recursos y Consumos Energéticos (CIRCE)

CIRCE Foundation (Centre of Research for Energy Resources and Consumption) was established in 1993 as an independent Research Centre to and develop solutions and scientific/technical knowledge and to transfer them business sector in the field of energy. CIRCE's mission is to drive forward improvements in energy efficiency and to spread the use of renewable energy means of the development of R+D+I activities and formative actions, thereby contributing to a sustainable development.

CIRCE carries out R&D&I activities with the ultimate aim of ensuring the energy efficiency of products, processes and services that contribute to reducing energy demand without compromising supply comfort and safety. The concept of energy efficiency ranges from the search for better technology on thermal and electric systems in a broad scope of sectors, to changes in behavior regarding energy usage, encouraging a wiser more sustainable consumption.

In PARITY project CIRCE is developing the following tools:

Table 6. PARITY exploitable component/ CIRCE

PARITY Tool	*OWNER*
STATCOM optimal placement tool	CIRCE
STATCOM hardware	CIRCE
Network status detection tool	CIRCE
ANM tool (active network management tool)	CIRCE

The Individual Exploitation Plan is currently in development phase and will be presented at the following version of Exploitation and Business Innovation Plan.

5.3 ANONYMOS VIOMICHANIKI EMPORIKI ETAIREIA PLIROFORIKIS KAI NEON TECHNOLOGION (HYPERTECH)

Hypertech (www.ht-energylabs.com) is a Greek SME founded in 1997. Its Energy Labs unit specialises in offering ICT solutions for the Smart Grid of the future. It aims to provide flexible solutions for small and medium-sized electricity consumers and integrated solutions for electric utilities and service providers (Aggregators) in the field of demand management. The business strategy of Hypertech 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 detailed consumption profiles (Consumer Profiling), tools for personalized billing reports (Informative Billing) and innovative solutions for building automation and power-to-heat (thermal storage) in typical water heating and space heating devices.
- Solutions for public agencies and business /industrial consumers: multi-parametric solutions to optimize energy consumption without compromising business performance targets (Enterprise 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 consumer 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 the Smart Grid, adopting the approach of the Internet of Things (Cloud and Standards-Based Services - "Internet of the Grid").

In PARITY project HYPERTECH is developing the following tools:

Table 7. PARITY exploitable component/ HYPERTECH

PARITY Tool	*OWNER*
IoT Platform	HYPERTECH
Building-as-a-Battery (BaaB)	HYPERTECH

The Individual Exploitation Plan for IoT Platforms is to utilize several market channels in order to exploit the IoT Platform that will be delivered as a PARITY project outcome. These channels include retailer markets, providing the IoT Platform to individual consumers, contractual agreements with energy service companies (ESCOs) which can offer this device as part of their services to potential customers, and finally contractual agreements with utilities and/or aggregators that aiming to investigate potential service-oriented business models.

The Individual Exploitation Plan for Building-as-a-Battery is built on the characteristic that this component can stand as an integrated component in a wider Home Automation Framework solution. Therefore, the individual exploitation plans for this component include only bilateral contractual agreements with Building Management System service providers.

5.4 MERIT CONSULTING HOUSE SPRL (MERITCH)

Merit Consulting House sprl (www.meritconsultinghouse.eu) is a Business and Management Consulting firm focusing on entrepreneurship, innovation and on the adoption of new technology applications in the business environment, with special focus on the fields of environment and energy. Merit Consulting House activities involve business model innovation and exploitation, market and policy analysis, innovative systems' integration, organizational change and customized process management services and techniques. The company also offers strategy, project management, financial management and ICT consulting services. Additionally Merit Consulting House offers preparation and specialized consulting services for the fulfilment of "ESG Criteria" (Environment, Social and Governance Criteria) in the context of investment screening throughout Europe and Middle East in vertical related to environmental and energy services. In the energy field, Merit Consulting House has significant experience, among others, in energy efficiency, demand response management, analysis and assessment of prosumers' energy behaviour profiles, energy behaviour modelling, human-centric comfort optimization strategies and energy policy reform, new models' exploitation strategy & business innovation planning.

In PARITY project acts as Dissemination & communication leader of PARITY and is responsible for business innovation planning and the PARITY replication/scale-up roadmap. The Individual Exploitation Plan is currently in development phase and will be presented at the following version of Exploitation and Business Innovation Plan.

5.5 Montajes Eléctricos Cuerva (CUERVA)

Grupo Empresarial Cuerva is a Spanish electric utility, active in the energy and electricity sector for more than seventy years. Cuerva in a few words is retail, renewable energy, distribution, innovation, forward thinking and customer focused. Cuerva is committed to combining development and growth with sustainability, innovation and environmental preservation, relaying on the impulse and dedication of its more-than- 90-people-team. The group's business areas comprise all electricity sector activities, namely electric power generation, distribution, and retailing. It also undertakes the installation and maintenance of electricity installations.

Cuerva is committed to combining both development and growth with sustainability, innovation and environmental preservation, relaying on the impulse and dedication of its more-than- 90-people-team.

The group's business areas comprise all electricity sector activities, namely electric power generation, distribution, and retailing. It also undertakes the installation and maintenance of electricity installations.

The Individual Exploitation Plan is currently in development phase and will be presented at the following version of Exploitation and Business Innovation Plan.

5.6 Sistemas Urbanos de Energías Renovables, S.L. (URBENER)

Sistemas Urbanos de Energías Renovables, S.L. (URBENER) is an Energy company created in 2010 with the aim of promoting the development of "smart" technologies related to the electricity market and its implementation in Spain. Development, growth and sustenance of URBENER is based on two fundamental pillars:

- Representation of companies and administrations in the Spanish electric wholesale market. (URBENER work as a retailer as well).
- Installation, management and maintenance of recharging points for electric vehicles.

Both aspects are in line with what electricity market is beginning to demand, at State and European level, and is aligned with the regulatory efforts and energy objectives of the European Union, and therefore, the Member States. URBENER has focused its resources on innovation and has developed solutions that have had a positive impact on the services offered. Two clear examples of this are the two platforms, available to its customers: a platform for the management and purchase of Energy in real time (Energy Manager) and a platform for the management of electric vehicle charging points (E- Mobility).

URBENER SL planes to introduce their current clients whose aggregated electrical demand is bought in the wholesale market into the flexibility market working as a BRP and BSP. For those, URBENER SL is constructing a platform for bilateral contracting and flexibility market interaction.

In PARITY project URBENER is developing the following tools:

Table 8. PARITY exploitable component/ URBENER

PARITY Tool	*OWNER*
Consumption data at real time.	Aggregator (URBENER SL)
Pilot plant exploitation (algorithm and infrastructure) of flexibility market trading at commercial buildings.	Aggregator (URBENER SL)
Pilot plant exploitation (algorithm and infrastructure) of optimal consumption at commercial buildings.	Aggregator (URBENER SL)

5.7 Building Facility Services Parohi Ipiresion Anonimi Eteria (BFS)

BFS (Building Facility Services SA) was founded in April 2014 in Athens Greece, as a full subsidiary of Motor Oil Hellas and is a part of a big conglomerate the "Vardinogiannis group of companies (Motor Oil Group)" which has more than 5,000 employees and operates in many business fields. The Company is headquartered in Maroussi Athens (12a, Irodou Attikou Str.) with additional facilities (warehouses and local offices) in Perama (next to Peiraus Port) and Thessaloniki (Northern Greece). BFS provides services to all the retail companies of the Motor Oil Group (including Coral, Avin and Cyclon – fuel stations). More in detail, BFS is the engineering company in charge of end-to-end installation, operation and maintenance of all conglomerate infrastructure, ranging from buildings to EV charging infrastructure. Additionally, BFS is active in the field of facilities construction and maintenance of gas stations outside the core Motor Oil Group.

In PARITY project is one of the pilot sites for demonstration of the developed solutions. Is responsible for the task on ex-ante surveys, pilot site audits and equipment installation planning as well as the task on equipment procurement and installation at the pilot sites.

5.8 DIACHEIRISTIS ELLINIKOU DIKTYOU DIANOMIS ELEKTRIKIS ENERGEIAS A.E. - Hellenic Electricity Distribution Network Operator S.A – (HEDNO)

The HEDNO (Hellenic Electricity Distribution Network Operator S.A.) was established in April 2012 with the secession of the Distribution sector of PPC S.A. in accordance with Law 4001/2011 and in compliance with EU Directive 2009/72/EC. HEDNO is the Hellenic DSO, responsible for the development, operation and maintenance of the Hellenic Electricity Distribution Network all over Greece including the mainland and the non-interconnected islands, involving different types of actors of the distribution grid. It is a 100% subsidiary of PPC S.A., however is independent functionally and administratively, in compliance with all the requirements of independence incorporated in the above legal framework.

In PARITY project performs an advisory role based on its experience from running a large distribution grid and retail/market operations on many small local energy system (e.g. islands). The Individual Exploitation Plan is currently in development phase and will be presented at the following version of Exploitation and Business Innovation Plan.

5.9 Checkwatt AB

Checkwatt is developing and marketing solutions that helps Swedish households and companies become smarter and more sustainable in their energy usage. Our first service EnergyInBalance was introduced in 2013 with the vision of achieving a balance between energy usage and production. EnergyInBalance has been expanded with EIB Solar which monitors PV production and manages the energy certificates and payments for the customers. Currently we are monitoring more than 2000 PV installations in real-time. Solmolnet offers large energy providers a branded solar energy monitoring solution. We are developing both hardware such as energy meters, certification meters and software solutions for energy analysis and benchmarking as well as smart phone apps for energy visualisation. CheckWatt is certified for communication in the EDIEL-system for communication between actors on the electricity market in the Nordic countries. Checkwatt was originally created as a spin-off based on results from several EU projects in FP7 and ECSEL.

In PARITY project Checkwatt main role in the project is to design, develop and operate the Swedish pilot use case. It will be based on Checkwatts currently installed user base of solar panel owners in Swedish households. The Company will also be responsible for the development of DSO tools for optimal DER scheduling and dispatch. Significant contributions in the pilot site demonstrations in Sweden. It is developing:

Table 9. PARITY exploitable component/ CWATT

PARITY Tool	*OWNER*
Stationary Battery Manager	CWATT
VPP Flexibility Manager	CWATT
Aggregator integration with LFM platform	CWATT
Aggregator to Prosumer UI	CWATT

The Individual Exploitation Plan is currently in development phase and will be presented at the following version of Exploitation and Business Innovation Plan.

5.10 Energilösningar Aktiebola (E.ON)

The E.ON Group is one of the largest private energy companies in the world and operates in the USA, Russia and Europe. E.ON core business reflect the key emerging energy trends: The transformation of yesterday's power lines into tomorrow's smart energy networks; The increasing demand for innovative customer solutions; The global growth of renewables; The international headquarters of the entire E.ON Group is based in Düsseldorf, Germany. E.ON Energilösningar AB has internationally around 30 million customers and has about 90,000 employees in the Group. E.ON Energilösningar Aktiebolag is an energy company which also provides customers with a variety of energy solutions such as solar PV, EVs and heat pumps. It has invested SEK 58 billion in development for the environment and delivery reliability in various ways between 2006 and 2013. These investments are made to optimally improve the product for the customers through the energy and the future's energy supply.

In PARITY project E.ON's main contribution is be in the development/research by providing customer insight, test subjects for pilot, distribution grid operation experiences, the relevant business perspective of the electricity retailer. Is developing the following elements and The Individual Exploitation Plan is currently in development phase and will be presented at the following version of Exploitation and Business Innovation Plan.

Table 10. PARITY exploitable component/ E.ON

PARITY Tool	*OWNER*
VPP integration into existing ancillary market trading framework	E.ON
Validating a unified flexibility management framework at the Swedish pilot sites	E.ON
Storage-as-a-service framework in the form of a battery solution	E.ON

The plan for the Storage-as-a-service framework in the form of a battery solution is to develop a best in market turnkey battery solution which offers load shifting, peak shaving and trading via a VPP in a smart and adaptable way. Our plan is that the battery solution will be compatible with other possible flexibilities (part of the PARITY unified flexibility management framework).

5.11 Azienda Elettrica di Massagno (AEM) SA

The Azienda Elettrica Massagno SA, founded in 1925, is a local electric utility producing power in their own hydro facility, managing (operating and maintain) the high/medium and low voltage grid and supplying power to 10'000 end users in the wider region of Masagno, Switzerland. AEM SA delivers a total of approx. 60 million kWh per year. Since 2007, AEM has made important investments in rolling-out smart meters for distance reading of the electricity consumption of its customers. At present, in fact, the smart meter coverage accounts for 50% of the AEM overall district. The company managers have a broad experience in the traditional and renewable energy business. AEM is committed to introducing pragmatic instruments for successfully dealing with the new market's frame.

In PARITY project is the Leader of the Swiss pilot site as local distribution system operator and retailer for the pilot participants. The Individual Exploitation Plan is currently in development phase and will be presented at the following version of Exploitation and Business Innovation Plan.

5.12 SCUOLA UNIVERSITARIA PROFESSIONALE DELLA SVIZZERA ITALIANA (SUPSI)

SUPSI is the University of Applied Science of Southern Switzerland. SUPSI takes part in this project with two institutes: IDSIA, the Dalle Molle Istitute for Artificial Intelligence, and ISAAC, the Institute for Applied Sustainability to the Built Environment. IDSIA is also affiliated with USI (University of Lugano). IDSIA is a world leading lab doing research in Artificial Intelligence and Machine Learning.

IDSIA develops innovative algorithms (such as the Long Short Term Memory algorithm, at the basis of modern Deep Neural Networks) and also focuses on applications to a variety of domains, including the energy and the environment

In PARITY project is developing :

Table 11. PARITY exploitable component/ SUPSI

PARITY Tool	*OWNER*
G2V and V2G flexibility module	SUPSI and CERTH

SUPSI does not foresee a direct exploitation of the result, being an academic partner. Our interest is in the development of innovative algorithms, and the generation of scientific publications and the fallout on our teaching activities. If requested we can provide support to the industrialization of the algorithms, and a licensing agreement can be established.

5.13 Hive Power Sagl [HIVE]

Hive Power Sagl is a spin-off of the University of Applied Science and Arts of Southern Switzerland (SUPSI) that is developing a platform for the optimization of smart grids. The goal of Hive Power is to create energy sharing communities where all participants are guaranteed to benefit from their participation, and at the same time achieve a technical and financial optimum for the entire community. This is achieved by devising a (mathematically sound) market mechanism that incentivizes the participants to collaborate with each other by coordinating their energy production and consumption. In contrast to other energy exchange market schemes, the Hive Power platform takes also into account technical aspects, such as cables, power rating, and voltage limits in order to provide an optimal solution that achieves multiple objectives. Hive Power is perfectly designed for the current grid configuration, enabling the electrical grid to operate safely and cost-effectively by ensuring a fair and resilient energy market for all actors involved.

In PARITY project is developing:

Table 12. PARITY exploitable component/ HIVE

PARITY Tool	*OWNER*
Local Flexibility Market	HIVE POWER

Hive Power will explore the European market of Energy Suppliers, DSOs, TSOs, and in general Aggregators, to implement for them these solutions in their premises.

5.14 ENERGIE MARKT ANALYSE (e7)

e7 is a private research and consulting organisation working in the fields of energy efficient construction and renovation, energy efficiency services and energy economics. The company was founded in July 2007 and is located in Vienna, Austria. The focus of e7 lies on specific questions and challenges connected with energy efficiency, use of RES and climate protection. e7 sees itself as a highly competent and independent facilitator between market and vision, practice and science, present and future.

The key resource of e7 is the technical, scientific and economic competence of the e7-team with 17 employees, which is based on many years of experience in research, customer-oriented consulting as well as the implementation of projects and programmes, both on national and international level. A specificity of e7 Energie Markt Analyse GmbH is the independence from interest groups and administration. This allows an open-minded approach to our customers' needs and an objective

processing of projects. Main fields of activity are market analyses for the use and distribution of energy efficiency technologies and services, strategies for business sectors, organisations and companies as well as the evaluation and development of tools for energy and climate policy. Economic assessments such as life-cycle cost analyses for buildings are also a major field of operation.

In PARITY project is Exploitation leader of PARITY and responsible for the i) investigation of coordinated market models for flexibility management, ii) definition of business. Is developing the following results:

Table 13. PARITY exploitable component/ E7

PARITY Tool	*OWNER*
Business consultancy service	e7
Policy consultancy services	e7

The Individual Exploitation plan includes Scientific publication on project results, Consultancy assignments for policy makers and regulatory bodies regarding energy communities, consultancy assignments for energy suppliers to enter the market of demand side flexibility, with a focus on local flexibility services. Moreover, it encompasses consultancy assignment for the real estate industry regarding practical implementation of energy communities.

5.15 QUE TECHNOLOGIES

QUE Technologies is an Athens, Greece based company with the mission to fuse technologies from the block-chain and the IoT domains to facilitate automated flexibility exchange through the use of smart contracts triggered by real-time context information. Our goal is to re-invent Building Control by introducing the Internet of Things (IoT) paradigm into Human Centric cutting-edge Building Management Systems for Homes and Offices that interact with the neighborhood and the energy system in a Smart City paradigm. Human-centric HVAC and domestic hot water control can satisfy people needs with significant energy savings due to building and water tack thermal mass exploitation, by accounting for tenant daily schedules and comfort preferences. Significant flexibility can be uncovered through coordinated HVAC & DHW control, on the basis of contextual, ambient & presence information.

In PARITY project is leading the specification design for the integration of the IoT components of the PARITY system to the block-chain enabled LFM platform. The Individual Exploitation Plan is currently in development phase and will be presented at the following version of Exploitation and Business Innovation Plan.

5.16 University of Nicosia

In PARITY project is developing the following results:

Table 14. PARITY exploitable component/ UNIC

PARITY Tool	*OWNER*
LFM Market Intelligence	University of Nicosia (UNIC)

The exploitation plan of UNIC addresses three main areas, namely, education, research and external collaborations. Regarding education, the knowledge gained by the exploitable result (LFM Market Intelligence) will be integrated with the related education programmes: (a) A free online course

"Introduction to Digital Currencies", (MOOC). The MOOC has enrolled over 40,000 students from 83+ countries since 2014.; (b) UNIC's MSc in Blockchain and Digital Currency which the first academic degree program in the world in this field, and graduates from this programme have been involved in leading blockchain organizations worldwide. Over 800 students from around the world have enrolled in the programme. Moreover, UNIC integrates its exploitable research outcomes within teaching, by linking them in real use case scenarios and exploiting their business and technical characteristics accordingly. Regarding research, UNIC aims to publish academic articles in high impact international journals as well as major blockchain-related conferences and workshops. In this context, we also aim to support a number of MSc and PhD theses focusing on the application of blockchain technologies in various areas including the energy sector and specifically Local Flexibility Markets. Furthermore, UNIC will seek collaborations with local and international authorities at the public sector as well as with other organizations and experts from the private sector.

6. CONCLUSIONS

Within the five chapters of the D10.3 PARITY Exploitation and Business Innovation Plan v1, the methodologies and the market tools are presented, which are applied to design the commercialization phases of PARITY Solution and the Key Exploitable Results of the project. Following the definition of PARITY Key exploitable results, as the highest potential entities for commercialization, a series of analysis regarding Local Flexibility Markets and Energy sector, will define the most prosperous route to market. The innovation elements of the developed results are examined to offer value-added solutions to aggregators, DSOs and consumers/prosumers. Each of the customer segments will be approached with a specific strategy for customer relationships and will be reached through the most suitable defined channels, to form the highest exploitation potential. All activities will be supported by the European Commission's services to improve the development of a concrete Exploitation Strategy for Project results and built a Business Innovation Plan that will ensure the commercialisation of the PARITY results.

Finally at the IPR management is a key element of the Exploitation strategy and all developed tools will be protected. The IPR commercialization is expected to be deployed, either individually or by Joint owned entities under specific terms that agreed among partners and directly by owners or indirectly through Licenses or through transfer of results.

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