ReDREAM
change your energy

D6.1 Library of bankable business models

Identification, presentation and selection of business models

[3rd November 2021]

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[1] PU = Public
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V2	02-02-2021	Alessandra Cassisi, Massimo Fuccaro, Andrea Sacchetto	Definition of potential bankable business models for the project's partners; development of chapters 1 and 3 and report on the main issues
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V8	05-08-2021	Angelo Giordano, Massimo Bolzicco	Recasted version after Project Coordinator quality check. Evaluation of business models relevant for the project's partners and better definition of value proposition, agents and channel of each business models.
V9	03-09-2021	Angelo Giordano, Massimo Bolzicco	Final version after PC's comments. Improved business model representation detailed canvas, plus further explanation of each business model.
V10	17-09-2021	Angelo Giordano, Alvaro Sanchez, Alessandra Porfido, Pete Capener, Alicia Carrasco	Redefinition of the relevant business model. Inclusion of a matrix for mapping BM and ReDREAM partners matching. Improved BM description adding a preliminary description and making them more high level/general. Improved Executive summary.
V11	01-10-2021	Angelo Giordano, Martina Di Gallo	Fine-tuned version of the Library to be discussed during the Madrid PTC meeting (6th-7th October 2021).
V12	20-10-2021	Angelo Giordano, Martina Di Gallo	Review of bankable business model after various workshops and discussion in the Madrid PTC meeting (6th-7th October 2021). Renaming of some business models and additional explanations added.
V13	3-11-2021	Alvaro Sanchez Miralles, Alessandra Porfido	Final PC review and approval

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Summary

ReDREAM Project

The energy market is rapidly transforming and so is the role of the consumer. Yesterday's passive consumers are central actors in today's energy markets. As new prosumers, energy markets can benefit from their generation, consumption, and storage capabilities. The EU-funded ReDREAM project will enable the effective participation of consumers and prosumers in the energy market. The project will develop a strategy for the creation of a value generation chain based on a revolutionary service-dominant logic in which services are exchanged. The project will foster the demand response tools and energy/non-energy services that enable consumers to participate in the energy market. This will lead to the establishment of a new concept: a connected user-centred energy ecosystem.

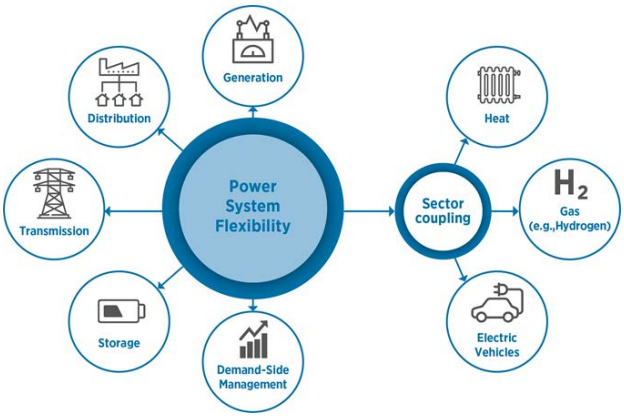
Executive summary

How will ReDREAM support the development of the partners involved?

Are there suitable business cases to support renewable local energy communities' growth and evolution?

To what extent the local legislation may impact on the various cases?

The main goal of this deliverable is to pave the way to new and attuned business cases, based on the results of the census done together with the four demo cases; as well as, on the emerging trends in the energy field, especially those deriving from the Clean energy for all Europeans package, namely: the raising role of the renewable local energy communities.



The work falls during the first part of the project deployment, as such the report has been largely focalised around new tailored business cases already compliant with the Dir (EU) 2019/944 by decoding new rules: enabling the active consumer participation, the prosuming profiles and the role of coupling (peering electricity and providing flexibility services through DR and storage). Of course, the asymmetries given by different degree of regulatory development among the four involved countries led the final choice, as well as the different profiles of the as is.

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Identification, presentation and selection of business models

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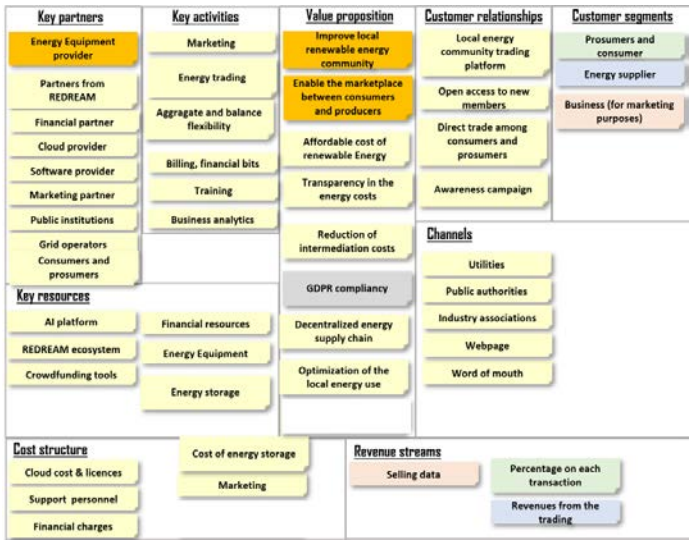
The result, according to the revised Renewable energy directive (2018/2001/EU), profiles a set of supportive models massively exploiting the role of the Energy Performance Contract (EPC) as key enabler for the business models profitability itself. Indeed, the enhanced version of EPC enables innovative business models combining the roles of Energy Service Companies (ESCos) with DR aggregators, highlighting the flexibility as an asset.



The deliverable feeds into the characterization of the forthcoming tasks and deliverables of the work package 6, such as T6.2 (the coupling of the D6.1 results with appropriated funding/financing schemes for each of the four demos), D6.3. (Scalability and replicability analysis), and D6.4 (Exploitation Plan).

Finally, the report has selected a library of viable business models fully compatible and interoperable-ready with the existing energy-market structures and standards. Looking at the feasibility, the list of operational models is not conflicting with the current role of TSOs and DSOs. Based on the above-mentioned assumptions, the set of business models are incremental compared to the business as usual, implementable, and considered fully bankable[1] as well.

[1] From 1 January 2021, bonds with coupons linked to sustainability performance objectives will be eligible as collateral for loan transactions to Eurosystem banks and can be purchased in the App and Pepp programs. The ECB decided this on 22 September 2020, placing as the only stake beyond compliance with existing criteria - the reference to environmental objectives as defined by the European regulation on the taxonomy of eco-friendly activities or by the United Nations.

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Table of acronyms

Acronyms	Description
RED	Renewable energy directive
DR	Demand Response
EPC	Energy Performance Contract
ESCo	Energy Service Company
TSO	Transmission System Operator
DSO	Distribution System Operator
IRENA	International Renewable Energy Agency
PSF	Power System Flexibility
VRE	Variable Renewable Energy
MVP	Minimum Viable Product
3PF	Third Party Financing
IEA	International Energy Agency
BRP	Balance Responsible Parties
DER	Distributed Energy Resource
EE	Energy Efficiency
EV	Electric Vehicle
RES	Renewable Energy Sources
BESS	Battery Energy Storage Systems
CaPex	Capital Expenditure
Opex	Operational Expenditure
PED	Positive Energy District
V1G	Vehicle To Grid – unidirectional
V2G	Vehicle To Grid – bidirectional

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V2L	Vehicle To Load
SES	Smart Energy System
SMES	Smart Multi-Energy Systems
ESS	Energy storage system
IoT	Internet of Things
DLT	Distributed Ledgers Technology
IP	Intellectual Property
SPV	Special Purpose Vehicle
EMP	E-Mobility Provider
SDG	Sustainable Development Goals
ESG	Environmental, Social and Governance
mSMEs	micro, Small and Medium Enterprises
AI	Artificial Intelligence
O&M	Operation and Maintenance
EIB	European Investment Bank

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1 Introduction

1.1 Description of work

T6.1. Identification, presentation and selection of business models (L: CIVI; P: COMILLAS, ZEZ, BIO, GALLESE, ENER, BWCE, STEMY, RIMOND) (M1 - M9)

The work to be carried out in T6.1 is described in detail in the Grant Agreement:

"*The task will perform an analysis of the most up-to-dated business models for the deployment of distributed energy resources. Specifically, there will be the focus on demand response, energy efficiency, and advisory tools, with additional cases on electricity and thermal storage, and solar PV business models, and other non-energy tools. As an overarching methodology, the task will classify the revenue streams, customer segments, electricity services provided, benefits obtained from electricity market participation and distributed energy resources. The task will deliver a systematic library of theoretical models in each distributed energy resource category. Within each model, concrete business cases are presented and fine-tuned. The fine-tuning activity will overarch the critical infrastructure drivers of the distributed energy resource business models: [1] Cluster the common characteristics, isolating the success or failure features of a business, [2] Current regulatory and policy environment, [3] Predictions and trends in technological, policy, and regulatory developments, [4] Set of commodity electricity services and emerging additional services. According to the four demos, hybrid model will be delivered. For example, hybrid model between ESCo and EMPs.*"

D6.1: Library of bankable business models [M9]

As a result, T6.1 delivers D6.1 described as "*The bankability of distributed energy resources business models and understanding the business models that are emerging in the power sector embracing more flexible and price-responsive management of electricity demand. That means, the library will have models assessed by a certified bankability software.*"

1.2 Market Status

One year ago, when ReDREAM proposal was in the fine-tuning process among partners, the International Renewable Energy Agency (IRENA) issued an info about the Power System Flexibility (PSF)[2] underlying that *"….by 2050, globally around 61% of electricity could be supplied by variable renewable energy (VRE) sources like solar and wind power…."*. ReDREAM, embracing that analysis, want to act as bridge between that forecast and the concrete transformation process of the Eu energy system. In addition, as described in the figure below representing the scheme of the Power System Flexibility, ReDREAM takes care of the requirements needed for balancing energy supply and demand as shares of VRE increase.

[2] https://irena.org/-/media/Files/IRENA/Agency/Publication/2019/Dec/IRENA_Demand-side_flexibility_2019.pdf

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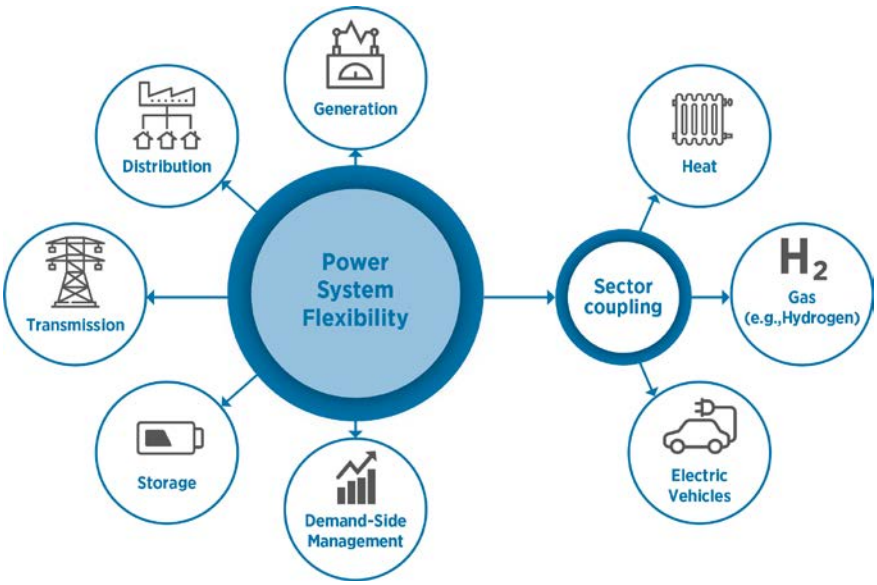

Figure 1 Scheme of the Power System Flexibility, Source IRENA

As such, ReDREAM promotes the **change in the paradigm** from the Centralized approach, centred on the demand-supply model, where the energy is a commodity, toward the demand-centric model, where the **energy is a service**, deploying the demand response (DR). The challenge is how to shift paradigm by leveraging the hype of the digitalisation and fulfilling with the gap of storage. ReDREAM will be an asset for demos to technical integrate small sized prosumers (citizen communities, single households, small enterprises, decentral power and heat storages, small and micro-grids) into a common DR innovative platform. As such, the assumption for the selection of business model based on the canvas should start from that on the right scheme (Offer-driven) of the figure below, with the aim to generate value for the stakeholders and not to maximise value for shareholders at all.

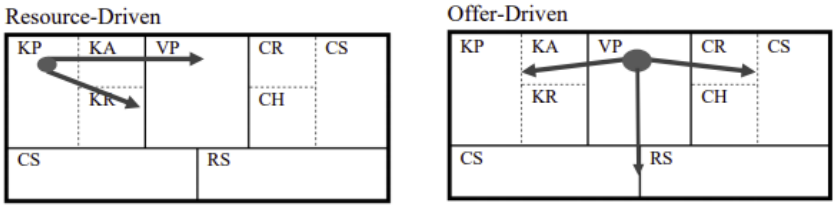

Figure 2 Business Model Canvas change in the origination phase

The ReDREAM ecosystem, describe in the figure below, underlying the DR platform connects three main areas:

- Societal, activate a democratic process of the energy as a community service with the active connection of the consumers
- Environmental, opening the loop of the circular economy through the sharing of energy and igniting the energy efficiency by sharing proximity energy resources
- Economic achievement of promoting several uses cases at demo level by deploying the ecosystem and considering a multi- market environment and multi-asset scenarios.

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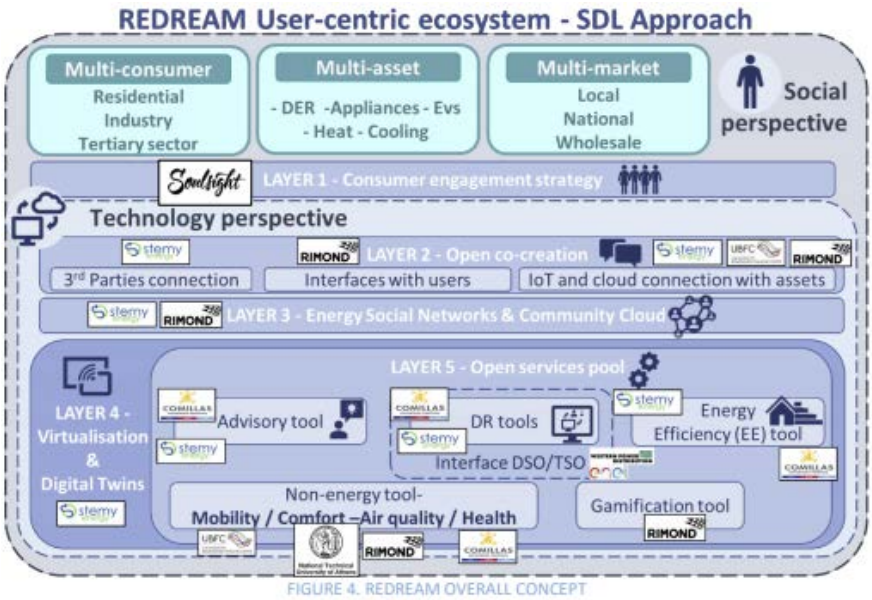
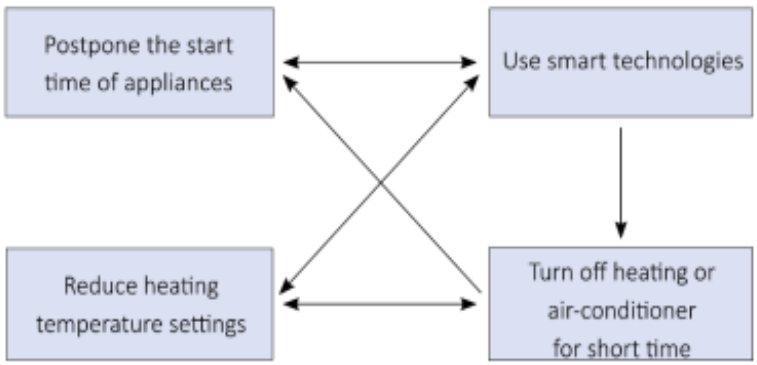


Figure 3 ReDREAM user centric ecosystem, source ReDREAM Grant Agreement

As such, it has been assumed that ESCOs and aggregators are crucial stakeholders that can promote investment in cost-effective business models and finance schemes to accelerate the deployment of DR solutions in new and existing smart buildings. The possibility to fully exploit the Minimum Viable Product (MVP) as an incremental strategy to attract the consumer engagement in a more transparent way.

In this sense, the expected ReDREAM business models aim to give the fast-growing crowd of consumers/prosumers a transparent and digitalized energy management tool, ensuring a solid self-due diligence process. On the other hand, the ReDREAM management model, thanks to the creation of a solid community, for which energy is the pivotal element, exploits the regulatory innovation, given by the EU Directive 2001/2018 (RED II) on energy communities.



Interdependencies found among four measures of willingness to adopt smart technologies.

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Figure 4 Consumer behaviours' changes, source Annex 67[3]

The **prospect of monetizing energy savings** aims to stimulate **virtuous behaviour within the community**, as showed in the figure above. In summary of the proposed architecture and in relation to the monetization process of virtuous energy behaviours, the **systematic use of EPC** (Energy Performance Contracting) contracts that fix the floor **beyond which savings become revenue for the user** is crucial the involvement of 3PF (third party financing) in the form of ESCos (Energy Service Companies), below the ESCo model scheme as sourced from IEA[4][5].

Figure 5 ESCo model scheme, source IEA

On the other hands, the same trends put the role of aggregators as key enablers for the energy transition process, such as:

- the expansion of renewable energy sources (RES) in the electricity grid and markets
- the growing role of the consumers on the demand side
- the huge number of business cases given by the digitalization

[3] International Energy Agency - Stakeholders' perspectives on Energy Flexible Buildings - Energy in Buildings and Communities Programme - Annex 67 Energy Flexible Buildings - December 2019 https://www.annex67.org/media/1911/stakeholders-perspectives.pdf

[4] Referring to ESCo, the deliverable takes the model of what IEA calls as Super ESCo model, designed to be a governmental entity; practically the model has been deployed mostly by private operators working both with public bodies and private customers. It is a very versatile and agile model allowing the final client to sign a single contractual obligation and to transfer the Operational risks to the implementing body. https://www.iea.org/reports/energy-service-companies-escos-2/esco-contracts

[5] Organizations often turn to Energy Service Companies (ESCOs) when considering retrofit projects since ESCOs have extensive design and implementation experience in integrating multiple efficiency measures, mitigating technical and performance risks, and providing a financial guarantee to project lenders that the energy savings generated will cover the debt service. ESCOs, in essence, act as project developers as they integrate the project's design, financing, installation and operational elements. Project contract terms typically range between seven and twenty years depending on the types of measures installed. The main differentiator between ESCOs and other energy efficiency contractors is the guarantee of energy savings which is specified as part of the terms of an energy savings performance contract (ESPC). https://www.naesco.org/what-is-an-esco

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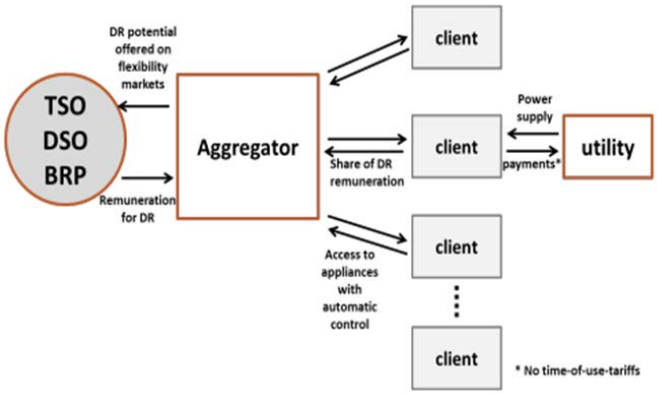

Figure 6 Aggregator model scheme, source Delta Project[6]

Thanks to DR platforms and smart meters it will be possible to pool consumers/prosumers loads and their small-scale generation allowing the entry into the electricity markets.

To close the loop, the Battery Energy Storage Systems is continuously decreasing in price by raising the performances. There is a recent case study on how the prosumers with PV could apply central battery storage and shared solar generation to aggregated apartment and common loads through an embedded network or microgrid in a cost-effective way and with clear financial benefits.

The case study held in Australia[7] has used real apartment interval-metered load profiles and simulated solar generation profiles, modelled using an open-source tool developed for the purpose. As for the local energy communities' development, an embedded network could generate the critical mass able to serf the trend in decrease the Capex for the installation and rump up the revenue stream, even with an increase of the self-consumption. As well as the Opex and the peak demand shaving are optimal due to the energy management platform.

[6] https://www.delta-h2020.eu/wp-content/uploads/2019/06/New-business-models-enabling-higher-flexibility-on-energy-markets.pdf

[7] Applied Energy, Volume 245, 1 July 2019, Pages 78-95 https://doi.org/10.1016/j.apenergy.2019.04.001

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The same concept has been expressed in a recent joint publication[8] related to the Positive Energy Districts, namely the ongoing evolution of the Smart City concept. Inside the PED the energy flexibility is pivotal in balancing the energy system in a cost-effect and reliably way. As described in the figure below, the technical solution to stand the system alone and reduce the energy is to provide the district *"…. with a sufficient storage capacity (both electricity storage and, through sector coupling, renewable* heat, *and gas) to balance periods of high variable renewable energy generation and periods of high demand but low generation. Within a PED energy system ……. storage supports the integration and optimisation of intermittent renewable energy into the system by storing excess renewable energy during periods of peak production to align with periods of peak demand…".*

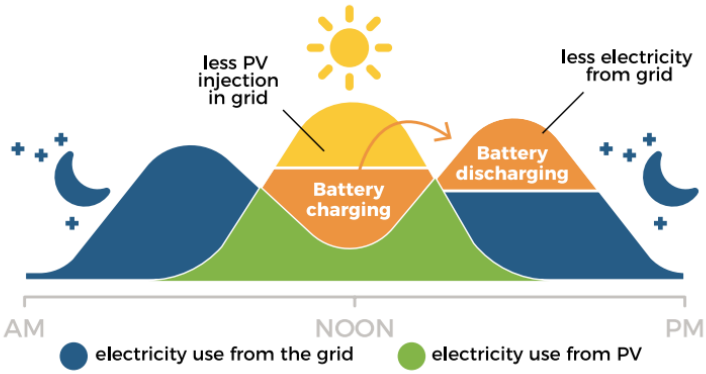

Figure 7 Vehicle Battery charging and discharging, source SCIS[9]

Assumed that the storage is an enabler to reduce the energy consumption, in the design phase of a local community the vehicle batteries are raising importance and diffusion. The IEA global EV outlook 2020 (issued in june2020)[10] outlines how "*…. off-peak electricity demand charging, dynamic controlled charging (V1G) and vehicle-to-grid (V2G)[11] could mitigate the impact of EVs on peak demand, facilitate the integration of variable renewables and reduce electricity generation capacity needs…",* as well it forecasts globally at least 140 million of electric vehicles by 2030 (**Stated Policies Scenario**): in few words at least 140 million of tiny energy storages with an aggregated storage capacity of **7 TWh**: after all, EV will absorb 550TWh of the global electricity demand. Below the scheme representing the upgrade from V1G to V2G.

[8] https://www.sparcs.info/what-is-new/news/peds-solution-booklet-published-smart-cities-information-system-scis

[9] https://smart-cities-marketplace.ec.europa.eu/

[10] https://www.iea.org/reports/global-ev-outlook-2020

[11] The V2G stands for "vehicle-to-grid": a technology enabling energy to be pushed back to the power grid from the battery of an electric car. A EV battery could be charged/discharged based on the system flexibility (energy production or consumption in the local community).

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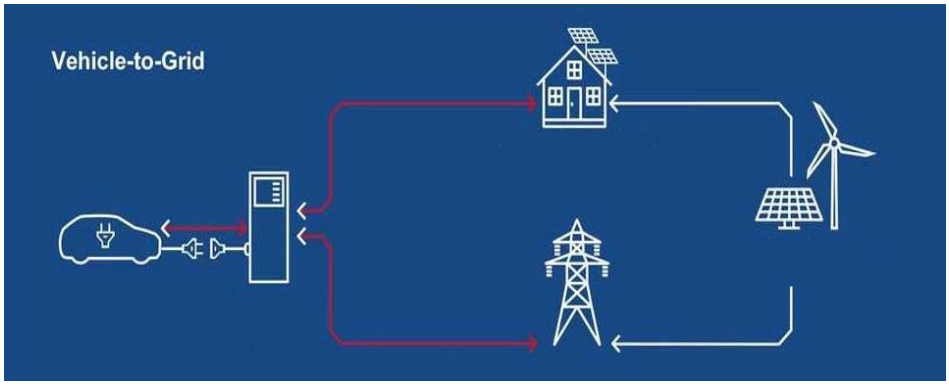

Figure 8 V2G bidirectional scheme

It has been described how the running digitalization process of the energy sector is paving the way to **new attuned business cases** applicable to the **energy-as-a-service paradigm**. From the other side, the current enter into force of the new European regulations and policies bears some **constraints** for a widespread diffusion of the decentralized energy system. That despite the maturity of the market, the robust business cases provided by the demo leaders, and the increasing interest and commitment of the customers for the flexibility,

The short-term forecasts, concerning the "acceptance" of these new rules of the game, tend to predict a **country-based breaches**: quite all Eu TSO will provide facilities and a huge number of DSO are moving toward the Energy Supplier 2.0 model, exploring as well new services. TSOs and DSOs will remain the main players, but **ESCos and aggregators**, together with the **EMPs will right size** a fragmented and capillary energy market: the closer it will act and grasp to the needs of the local communities and the prosumers, the more it **become the benchmark** augmenting the chance to stay long-term on the market and gain substantial shares.

The **deal breaker**, as duly restated by the IEA in the World Energy Outlook 2020 issued in October 2020[12] , could be the "*…..Electricity grids could prove to be the weak link in the transformation of the power sector, with implications for the reliability and security of electricity supply….There is a disparity in many countries between the spending required for smart, digital and flexible electricity networks and the revenues available to grid operators, creating a risk to the adequacy of investment under today's regulatory structures….*"

1.3 Data driven approach for prediction of power flexibility

The social innovation, the gamification and the digital twinning

As properly defined by URBACT II, urban strategies to deliver social innovation are fundamental. It could be instilled to the governance of energy transition as well: new forms of collaboration between the community administration, the local government, citizens, and local stakeholders can generate more sustainable, resilient, and open energy systems at local level. Therefore, they contribute to a

[12] https://www.iea.org/reports/world-energy-outlook-2020

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cohesive approach to climate neutrality. Briefly, in ReDream empowering citizens passes through digital technologies.

Digital social innovation[13] aims to reorient technology to social ends and to benefit the many rather than the few. As well, they empower citizens to take more control and to use their collective knowledge and skills to positive effect. Digital social innovation makes government more accountable and transparent and foster and promote alternatives to the dominant technological and business models: they represent alternative more open and collaborative rather than closed and competitive, thus favouring the use of technology to create a more environmentally sustainable society.

As such, digital twins are enabler in the energy management processes, by enhancing customer service and designing a virtual model of customers. ReDream will exploit a single customer experience, based on the gamification[14] [15]and the digital twin model: with digital twins, prosumer/consumer can monitor through second personas their energy model. These patterns are fast-changing the supply chain especially those related to the short-term production plans, based on measurements of recent consumer demand: this is an example of the citizen/consumer/prosumer-centric approach of the market.

1.4 Collaborative intra-project activities

WP6 is focalised on the business intelligence activities for market up-scaling. WP6 has a two-stepped process aiming to: identify, present, and select business models, funding, and financing schemes (first phase) and analyse the sustainability and the replicability of demos and create an exploitation roadmap (second phase). The first phase (T6.1 and 6.2) will create a catalogue of possible and emerging bankable business models compared to the demo implementations and a catalogue of viable and proper funding and financing scheme to be coupled with the business cases. The second stage of the process (T6.3 and 6.4) will perform the scalability and replicability analysis of DR solutions deployed: if they could be scaled-up and replicate, and what if in case of different use cases. Finally, the second stage will produce an exploitation roadmap with the timeline of actions for IP management and market deployment of the project results.

[13] https://social-innovation.hitachi/en-eu/about/white-papers/digital-energy

14 E. Doerre, D. Nestle and J. von Appen, "Enabling flexible electricity demand through event-based incentives and gamification," International ETG-Congress 2019; ETG Symposium, 2019, pp. 1-5.

[15] Gamification-based framework for engagement of residential customers in energy applications - Energy Research & Social Science, Volume 44, October 2018, Pages 187-195 - https://doi.org/10.1016/j.erss.2018.04.043

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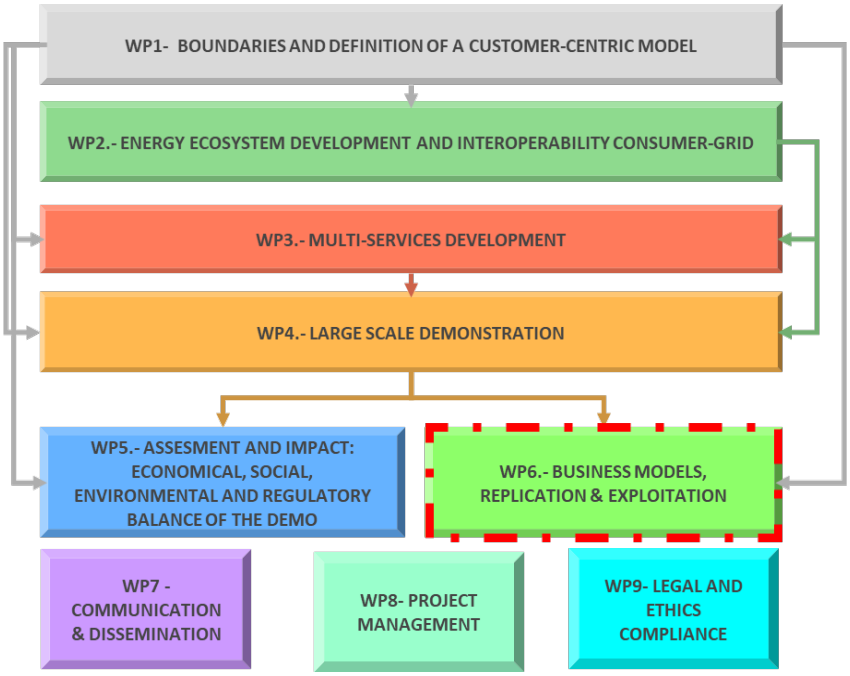

Figure 9 ReDREAM project interconnections among work packages, Source ReDREAM Grant Agreement

The overall aim of the WP6, as showed in the above figure, is to achieve the ReDREAM Specific Objective nr.9 "*select and test a portfolio of portable business models as drivers to trigger demand response schemes in Energy Efficiency (EE) under the consumer‑centred approach among key stakeholders such as, local energy communities, energy cooperatives, ESCOs, aggregators, DSOs, etc. A refined business plan as a strategic roadmap for each actor considering its position in the value chain to get a smooth market penetration of the innovations in tangible products and services by 2024 will be done*".

As well, WP6 aims to score two Operative Objectives: nr.6 "*identify, present and select a pool of portable business models, funding and financing schemes (T6.1, T6.2), after designing the most appropriate financial schemes in each DEMO, to analyse their capacities to trigger investment models and finance mechanisms ensuring their sustainability and replicability (T6.4)*"; nr.7 "*carry out an exhaustive profitability analysis and exploitation and replication plans as key roadmaps to ensure a smooth market uptake of the REDREAM solutions (T6.4)*".

As such, the task 6.1 has pointed out a map of the most up-to-dated business models suitable for the demo cases able to deploy the distributed energy resources.

Being a horizontal task, the D6.1 has involved at the beginning a core team among the consortium, asking them to be co-designer of the set of information. The four demos have been involved to act as funnel, by decoding their business cases and their local value chains. The mapping has also covered

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the local legislation and market. As such, it has been done a collaborative exchange of info with Omie[16] and Olivo[17], partners involved in the WP1, understanding the status of the art of the "Smart Readiness Indicator and KPIs" (task1.2) and the "Regulation and Standardisation analysis for project DEMOs" (task1.3).

This parallel activity gave consistency to the final part of the deliverable 6.1 in terms of alignment of value proposition with the real local market conditions and forecasts.

Of course, all the above-mentioned activities were focalized around the exploitation of the Stemy[18] software and platform managing the DR demos. As well, the co-design activity on the KPIs was bi-directional, in the sense that was done paving the way for the key requirement needed for the tasks 6.2 (selection of appropriate funding and financing mechanisms) and the definition to align EU policy with customer engagement. In the figure below, the info flow among different tasks.

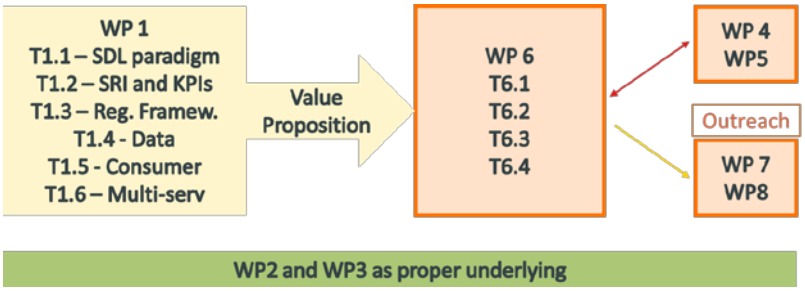

Figure 10 Inputs and Outputs flow, Source ReDREAM project Grant Agreement

[16] https://www.omie.es/

[17] https://olivoenergy.com/

[18] https://www.stemyenergy.com/

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2 Demo's characterization

This chapter connects summaries info exchanged with demo leaders and gives an overview of the initial demo diagnosis and planned activities in ReDREAM. The aim of this deliverable is to provide the four demos with a holistic roadmap able to boost their own business as usual into a renewed transition toward business models. The census is compliant with their development strategy together with the assets and knowledge provided by ReDREAM project.

The roadmap was developed through idea setting, feedback rounds with demo leaders and synthesizing these outcomes to be impactful as a basis for overall work package. Therefore, it can guide the four demos, looking to their business-like transformation processes.

Case n.1 – UK Demo

From the GA

Bath & West Community Energy (BWCE) is a not-for-profit, Community Benefit Society, which puts people at the heart of the energy transition, placing ownership and control of energy in the hands of consumers via clean energy projects that actively involve and benefit local communities. BWCE has so far installed **12.35 MW of community-owned** renewable energy, enough **to match** the annual electricity demand from **4,000 homes**. In addition to this, we are developing a community-owned electric vehicle charging network and exploring community renewable heating projects.

Whilst our main focus has previously been on renewable generation, we have become increasingly committed to energy demand management as a core element in de-carbonising the UK electricity grid. This is why we have teamed up with Stemy Energy to develop Flex Community.

Flex Community integrates digital technology designed by Stemy Energy with energy devices. These include heat pumps, electric vehicle charge points and immersion heaters. They enable householders to offer flexibility to the electricity grid, thus helping balance supply and demand. By building a 'community' of 'flexible' energy consumers, we aim to reduce carbon emissions, electricity bills and the need for major grid upgrades. Ultimately, being able to better manage demand will allow for more renewable energy on the electricity grid, especially community-owned generation that directly benefits the communities in which they are sited.

Through the support of Next Generation Funding from Power to Change BWCE and Stemy Energy have been trialling Flex Community in Bath and surrounding communities. As part of ReDream BWCE will be collaborating with Avalon Community Energy and other community and environmental groups to deliver Flex Community. We will be working with the grid operator, Western Power Distribution, in part of their Constraint Management Zone (CMZ) in Somerset, England.

The area encompasses part of the Constraint Management Zone where the network operator Western Power Distribution (WPD) is promoting consumer flexibility to balance demand. It is a predominantly rural area but includes the small city of Wells (population 12,000) and the towns of Glastonbury, Shepton Mallet and Street.

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After talks

Basically, what has been learnt from the round of meetings is that BWCE **sells electricity** from its solar pv installations either (a) **direct** to the on-site consumer i.e., the building owner of the building upon which the pv panels have been installed; or (b) to an **off-taker** for the solar farms where there is no on-site demand. **Any surplus profit** is allocated to a **community grant fund**, which is available to local communities to support their action on carbon reduction and fuel poverty.

Together, the **local distribution of surplus funds** and the **retention of economic value** in the local area generates significant **social value**. As such an Economic Multiplier model measuring and exploiting the indirect impacts would interesting and **Social Return on Investment** could be a Key Performance Indicator. Assuming the ReDream project is successful and BWCE can operate a viable local community **aggregator business** by **selling flexibility services**, then BWCE will be able to support Stemy Energy in expanding the provision of energy services to households.

As a result, as well as the indirect social impacts, BWCE is also looking to **quantify the direct impact**, particularly the financial impact and the financial viability, of the proposed flexibility business model. Is there a **viable community role** that can add value and can generate sufficient income to cover its costs?

As well as the business development generated by ReDREAM, BWCE are keen to test the degree to which demand side response can help ease grid capacity constraints and support the installation of new renewable energy projects. An important issue pointed out by the demo leaders was related to important **additional services** offered as part of the ReDream project that will make it easier for householders to install **EV charge points and heat pumps** and will test the ability for peer-to-peer trading to maximise the local use of both household and community scale solar generation.

As a result of the Brexit process, the UK will be no more under EU legislation. Concerning the concrete application of the business model, it is necessary to further assess the impacts on the proposed business models.

Case n.2 – Spain Demo

From the GA

EnergÉtica is a **non-profit cooperative of renewable energy consumers**. We put energy back in the hands of citizens and we offer a variety of services to move towards a 100% renewable and socially committed energy model.

EnergÉtica is a group of people aware of the unsustainability of the energy model based on fossil fuels. In 2015 we founded a non-profit cooperative of users and consumers of services related to electricity and renewable energies. Our main goal is for **citizens to have access and control over the energy they consume**. The cooperative provides **100% renewable electricity** to its members and clients. We own a small hydroelectric plant in Peñafiel (Valladolid); we design photovoltaic self-consumption solutions and install them in the residencies, industries, and communities of our members. We also carry out energy audits and advise on renewable air conditioning.

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In particular, the cooperative participates in innovation projects. We understand that this is the way to continuously improve in order to reduce the environmental and social impact of its partners' energy uses and to increase the energy sovereignty of the citizens in general. ReDREAM will provide a great opportunity for us to dip deeper by providing tools for citizens to actively interact with the electricity market, reduce their energy costs and enable a collective response to the challenges of flexibility and demand aggregation.

EnergÉtica focuses its activity on Castilla y León, the largest region in Spain with more than 94,000 km2. Located in the centre-north of the Iberian Peninsula, it is a region with a farming tradition (5% of GDP comes from farming compared to the 2.8% for Spain). It is sparsely populated with 2.4 inhabitants/km² who are remarkably aged (aging index of 193% compared to 120% in Spain). The combination of its continental climate (long cold winters and hot summers) and its dispersed population makes the region largely reliant on fossil fuels and its electrification highly challenging.

In addition to developing ReDREAM in some rural locations, the demonstrator will focus on Valladolid (300,000 inhabitants), the administrative capital and largest city of the region.

After talks

The ongoing definition of the next business plan aims to define the business lines that will govern the cooperative activities during the following years. It seeks to strengthen each of the existing ones, and potentiate new opportunities to align the provision of services with the new regulation framework, especially in what concerns **flexibility or balance services and energy communities** and build them on the opportunity that innovation projects bring.

Moreover, EnergÉtica would like to investigate new funding schemes and business models to potentiate **shared self-consumption** and increase the share of **own generated renewable energy** against the total consumption of all its members, avoiding as much energy losses as possible as could happen with individual self-consumption activities.

As of today, EnergÉtica is not an independent energy retailer, but has an agreement with the biggest cooperative in Spain (Som Energia). To offer better services and decrease the response time to its users, it is intended that it becomes an **independent retailer** in the short to medium term. Potential flexibility business models could emerge here, as offering incentives to the consumers to change their energy behaviour contributing to modify tariff prices. The forthcoming business plan of EnergÉtica would look at the **business model of Aggregator**, looking at the most appropriate **funding scheme to pipeline a consistent and robust revenue stream**.

Case n.3 – Italy Demo

From the GA

Gallese is a small town of about 2,800 inhabitants. It will be interested in monitoring the electricity consumption of private homes, companies, and public buildings. This will help the town plan and set up an energy community for the production and consumption of renewable energy.

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Gallese (VT) is located in the Lazio Region, in Central Italy. It has an area of 37.17 km² and an average elevation of 135 meters above sea level. Much of the territory is occupied by woods, countryside and small rivers inside canyons that delimit the city centre. The population is mainly divided between the historic centre, Sant'Antonio district and Gallese Scalo where there is the railway station and the hydroelectric power plant "Ponte Felice", on the Tiber River.

The Municipality of Gallese (VT) is very attentive to the issues of renewable energy and respect for the environment, with many public buildings equipped with photovoltaic panels for the production of clean electricity. In addition, in the territory of Gallese (VT) there are two hydroelectric power plants, one on the Tiber River with an operating capacity of 18.0 MW, the other, which exploits an artificial basin, with two generators of 250 Kw and 150 Kw capable of generating 800.000 Kwh each year.

After talks

The Italian demo has the oddity to be the **first-of-the-kind inside a broader area under** the umbrella of the Biodistretto della via Amerina e delle Forre. Indeed, while the demo acts in a mix of Green-Brown field aiming to create a **local renewable energy community** with additional services such as the e-mobility in the small town of Gallese, **the replication potential will be next** and will cover the whole are of the bio-district: other 14 small towns with more that 75k inhabitants. The business case in Gallese is running around the public notice to build up a renewable local energy community **coupled with the creation of a e-vehicle charging infrastructure**. Stemy devices will boost the consumer engagement as well as the prosumer attitude to share their flexibility and implement the V-to-G model. The creation of an **SPV acting as ESCo and EMP** could be the main value proposition.

Case n.4 – Croatia Demo

From the GA

Green Energy Cooperative (ZEZ) is engaging citizens in the energy transition as they are the pillars of the shift towards sustainable development and use of green energy. The goal of the REDREAM project is to enable greater consumer engagement (within the residential, industrial, and tertiary sectors) in the energy market, through an open platform that allows direct communication between different actors. Addressing this challenge requires the use of advanced IT tools and services, to successfully respond to demand and improve the predictability of consumption patterns and consumer behaviour. In Croatia, the demo site will be the City of Varazdin.

Changes in consumer behaviour will be monitored and encouraged through the use of smart devices, i.e., smart meter devices for household appliances, and controllers for heat or cooling in industrial plants. These devices will be provided by the Green Energy Cooperative for citizen-owners of small solar power plants and organizations that will participate in research as part of the project.

Key project activities:

- Reducing energy bills by installing smart devices

- Networking and user interaction through an open platform

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- Strengthening the local community through the involvement of people in the energy transition

- Increasing energy efficiency and environmental protection

- Giving citizens a major role in the energy transition by changing user behaviour

Varazdin is the city of baroque, young people, music, flowers, bicycles, and vibrancy. “Little Vienna” with a rich natural legacy interwoven in parks, located in northern Croatia on the banks of the River Drava, is the capital of Varazdin county, one of the oldest in Croatia. The city with its 9 surrounding settlements has a population of almost of 47,000, making it ideal for testing and implementing innovative tools and maximizing local impact.

In mid-2019, Green Energy Cooperative (ZEZ), in collaboration with the city of Varazdin, started a community led project to install PV systems in a residential area. Local authorities, citizens and local entrepreneurs will be gathered by the ZEZ to develop and implement resilient business models.

25 installed PV systems in a residential area of the city of Varazdin

1,200 Mwh of potential annual electricity consumption that can be converted into green energy

98% of citizens are interested in investing in other RES (renewable energy) technologies in their household

45 % of citizens interested in investing in RES projects in public buildings

56% of citizens interested in associating through a local energy cooperative

1,600 Members in Solar Club: an initiative supported by the ZEZ where people can learn, help, share experience and knowledge about the solar energy. Easy and quick administrative process for instalment of the PV system.

After talks

The current model is the cooperative energy consultancy company **aggregating the supply side** matching with possible customers aiming to set **their solar system**. The added value is what they give community toward the **energy transition**. As such, they hosted a **landing page** on which potential community customers/prosumers could obtain **micro loans** for deploying PV systems (1,33 kWh) funded by a **crowdfunding** campaign matching the grants of EIT Climate Kic with those of an international commercial bank. Zez would address subsidies from National green funds to households and even to large industries. ReDREAM will aid them to **measure and monitor the energy flow and the behaviour** of the community: the tools and the capabilities will boost the Zez to create a **joint procurement platform** for the solar installation and diffusion: that will increase the revenue side.

ZEZ has been developing a business model for community led solarization, to encourage Croatian citizens to take active role in the energy transition and help grow local economy.

A standalone matchmaking platform “On the Sunny Side” is the core element of this model. The platform connects citizens (homeowners) interested to invest in their own roof-top solar PV system with solar entrepreneurs – namely project designers and solar installers. The main objective in development of the platform was to create and offer a one-stop solution for roof-top solar PV systems for self-consumption in households, with incorporated cooperative approach and values.

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Key activities include (1) building an ecosystem (through strong partnerships with solar entrepreneurs, collaboration with local authorities and teaming up with commercial partners), and (2) community activation (through communication activities such as Good Energy Tour and setting up an online community Solar Club).

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3 Library of bankable business models

3.1 Disclosure

This section focuses on a set of emerging business models **suitable** to approximately all project partners with a specific focus on demo projects, according to the disruptive technologies that could have a positive impact on the economic growth of the **local community-led value chain**, by enabling environment and fostering **long-run innovation**. In a nutshell the library of business model starts with **two un-conventional** cases to deploy the DR at local level, such as:

- the **Marketplace Platform**
- the **DR Consultancy Service**.

Later, a set of implementable business models are presented according to their maturity level:

- the **Energy Community – inner flows** about trading system at community level
- the **Selling Flex services** represents pure trading flexibility, also known as the aggregator model, that could pave the way to other scalable business models such as the next one
- the **Energy community - solar fields or extra services** enabled by the aggregator model
- the **Improving energy efficiency and well-being** enhancing the ESCo model based on the exploitation of the Flexibility
- the **Vehicle-to-Grid**'s role in the framework of an EPC.

3.2 The Business Model Generation technique

The analysis embraces the trend that goes beyond the classical approach of Osterwalder and Pigneur (2010), incorporating environmental y social costs and benefits. This has allowed to understand the challenges of the transition towards distributed power generation for energy supplier. A recent paper issued by the Cleantech group[19] has duly underlined the importance of new approaches in the co-design of regenerative business models not even more environmentally destructive, but regenerative empowering local communities.

As such, one of the main objectives of ReDream is to assist the demos, and their ecosystem, in co-design a set of viable business models according to:

- the captive social needs
- the emerging technologies
- the forthcoming disruptive mega trends.

In this work package, an enhanced structure of the traditional canvas model (the classical approach represented in the figure below) has been used (and it will be used again) as it is able to give demo leaders' the capability to catalyse the transition, the citizen engagement and the player's market entry, through a public open process.

[19] https://www.cleantech.com/release/top-innovators-finding-solutions-to-fight-the-climate-crisis-announced-in-50-to-watch-list/

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5. Key Partnerships	**6. Key activities**	**1. Value Proposition**	**3. Customer relationships**	**2. Customers**
	7. Key resources		**4. Distribution channels**	
8. Budget cost		**9. Revenue streams**		

Figure 11 BM Canvas, classical structure

Redream rationale approach has started from the pure role of what BM would have in a local energy transition process when working with two main drivers, the Innovation side, and the local ecosystem side. The first step is to investigate the climate-neutral local value chains, considering the de-risk analysis of innovative technologies. The second step is to benchmark the context[20] around a set of ad hoc KPIs, such as the creation of new green jobs, new clean industries, etc. As such, it has been added to the classical canvas two additional blocks, according to the figure below.

11. Environmental costs *What negative environmental impacts can the proposed services cause?*	**12. Environmental benefits** *What environmental benefits will the proposed services deliver?*
13. Social risks *What are some of the potential social risks that the proposed service entails? Who is most vulnerable as a result?*	**14. Social benefits** *What social benefits will the proposed services bring about? For whom will these benefits materialize?*

Figure 12 Additional block to the classical BM canvas, source Public Management Review[21]

The results, as said in the chapter one, was a set of value proposition canvas based on the OD and not even more on the RD, see figure below.

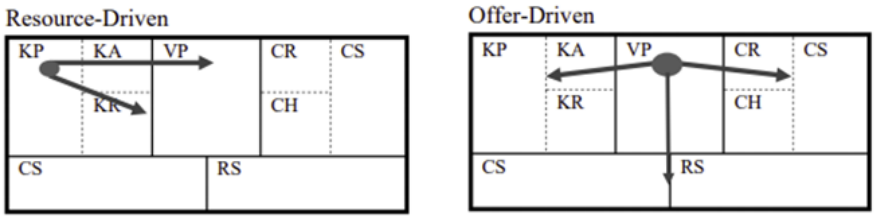

Figure 13 Business Model Canvas change in the origination phase

[20] Difference in the legislation, the weather, the social welfare, the building stock, the energy price, the ageing, the land use, the sustainable mobility plans, the behavioural etc

[21] Krista Timeus, Jordi Vinaixa & Francesc Pardo-Bosch (2020): Creating business models for smart cities: a practical framework, Public Management Review, DOI: 10.1080/14719037.2020.1718187

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The full package will be available only in each demo customized deliverable, related to the task 6.3 (the scalability and replicability analysis), where it will be considered the follows:

- Filling in one business model canvas does not guarantee a good business
- Co-creation process requires constant development, testing and validating with users and the ecosystem stakeholders
- Design and business challenges are complex, and solutions require systematic change

In addition, from a ReDREAM demos perspective, the presence of an **asset underlying** the business case definition, such as the **local community** coupled with an infrastructure **to produce renewable energy**, is a factor of interest for new investors. In this perspective, the definition of the business models (**tending towards**) should no longer be limited to the search for **short-term revenues**. They were typically linked to unproductive investments, while the definition of a business model combining local community commitment and energy transition will envisage to endure many years after the possible break-even: it shows the need of someone who continues to take care of that and adapts it to the needs of time that passes until the natural disposal of businesses.

The report has drafted models able at **creating value for stakeholders**[22] (local community): the process was model based on the possible **measurement of social impacts** in terms of the income statement that can intercept the need for projects with positive effects[23] on the territory (in social, environmental and energy terms). This trend is expressed by the financial community (and the forthcoming trend in investment finance, the so-called **Impact Finance**) according to the **multiple-benefits approach**[24], and it is considered as a reference framework by UN's SDGs and specific targets.

By including the broad range of multiple benefits originated by transition actions, it is possible to create a comprehensive long-term vision and strategy that meet the needs and expectations of many stakeholders and investors. Sustainability requires finance that can expand the boundaries of traditional instruments.

Indeed, the above-mentioned issues are crucial in the definition of the bankability concept: it has different features among stakeholders, even if it is a fundamental tool. Finally, there is no common understanding of its meaning. Based on the third-party financing's experience, bankable is a project (or proposal) that has **sufficient collateral**, **future cash flow**, and **high probability of success**, to be acceptable to institutional lenders for financing. So, concerning the high probability of success, it is mandatory to ensure a project's soundness, **not only economic and financial matters but even due diligence in legal and technical matters**.

As such, the final goal of the deliverable is to pave the way to the forthcoming tasks (6.2 and 6.3) in terms of compliance with financial aspects: D6.1 addresses this scope by selecting business cases to demos on three macro areas: the economic area (business models and business plans); the financing area (funding schemes and financial mechanisms); the capability area (turnkey tools and processes for the scalability and replicability analysis). As such, the D6.1 is the first part of a comprehensive support and coach to demos in:

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[22] The Value of Everything: Making and Taking in the Global Economy, Prof. Mariana Mazzucato, Penguin Books Ltd, 2019

[23] Climate-energy policies started in the 90s to encompass the "co-benefits" concept in their rhetoric, to focus the perspective from mitigation costs to development opportunities, and to highlight other socio-economic advantages. Indeed, such policies, if effectively designed correctly run and accurately assessed, can result in multiple benefits outweighing implementation costs.

[24] Multiple Benefits of Smart Urban Energy Transition. In P. Droege (Ed.), Urban energy transition. Renewable Strategies for Cities and Regions (Second, pp. 467–487). Elsevier

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- Due diligence process of the economic and financial assistance
- How to approach the most optimal funding and financing sources enabling energy transition
- Use of innovative funding scheme and settling local financing schemes
- Customize sets of revenue models in multiple community's value chains enabling ecosystems
- Drafting the "Non-financial reporting" and decode non-monetizable benefits into possible funds
- Support and coaching to demos in fine-tuning of financing and business models.

Understanding the results of the task 1.1 deployed by Soulsight[25] together with the demos and related to the **social innovation**, as the **involvement of the citizen** (community stakeholders and citizenship) is essential to elaborate a robust energy transition process: this will enable to assess the value of naturing the ecosystem services.

As an example, some issue emerged during the discussion on business models among demo and technical partners:

- Energy efficiency can also be automated? - e.g. hot water heating automatically shifted to close to the time of use based on system intelligence learning householder behaviour. Or shifting demand to better optimise solar generation on the building?
- I think we must clarify that flexibility doesn´t have direct impact on the consumer. It is more the efficient use of energy in the grid.

Below an example on how convey crystal clear messages to embed people (simplification provided by Soulsight).

Energy flexibility (automated)	**Energy flexibility (automated)**
Which is the best moment to consume energy to help the grid to be more stable and therefore avoid extra cost on its maintenance or upgrade needs? "*Stop heating the room (it can happen automatically) during the next 15min because it will help to mitigate a peak on the grid*".	Which is the best moment to consume energy form a cost perspective for consumers? *"It's better you put the washing machine and dishwasher at night because you will reduce the cost of your bill."*

In the matrix below, it has been identified a match between each ReDREAM partner and the business models outlined in the library. The matrix has been discussed during the first physical consortium meeting, helping to solve the mismatches and the misunderstanding.

[25] https://soulsight.es/

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Partner's name / Business Model	Ener	Bio-Gallese	Zez	Bwce	Comillas	Stemy	Civi	Rimond	Timelex	Soulsight	Ntua	Ubfc	Omie	Esci	Olivo
Marketplace															
Consultancy															
Energy Community - inner flows															
Selling Flex services															
Energy Community - solar fields or extra services															
Improving energy efficiency and well-being															
Vehicle 2 Grid															
		Only in case of ReDREAM exploitation plan													

In the following paragraphs, each of the business models listed above will be developed and detailed.

3.3 Marketplace

This business model is meant for a newco made by Redream project partners, or even for single partners such as Demos, Stemy, Civi and Rimond. It will exploit the ReDREAM platform ecosystem. It means that at demo level it will be possible to **create a local-tech-based marketplace for the fully deployment of the energy flexibility market and its value chain**. The main customers are utilities, energy equipment providers, SMEs and residential customers. The main revenue stream is deriving from the fees per transactions and the big data selling to third parties.

Value Proposition

In a local context a **full list of use cases** (additional services to the DR platform coupled with its financing mechanism) will be **tailored and settled for each need and energy framework condition**. ReDREAM marketplace tool and the local demo could establish a commercial procurement platform.

It should be created a legal entity able to settle and sell the platform. At ReDREAM project level it could be convenient to share capital among members or using alternative means of financing.
ReDREAM settling the AI platform could pool resources and skills from the consortium members to achieve its mid-long term economic and company equilibrium. In the short term, members of the AI platform will cover the CaPex with their own resources, in cash and kind for the self-sustainability. Alternatively, and to avoid the bank loan, it could be possible mixed equity on crowdfunding approach with the aim of shifting the equity from financial markets to the real economy.

Outreach

Similarly, to the AirBNB Business Model, in the triangle of the business model there are local mSMEs or public companies such multi utilities, tech-

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	provider and business players. In the middle the local energy community together with the AI platform.
Financial	O&M costs as the normal AI platform, plus costs of IT embedded people. At dealing, the matchmaking platform earns a small percentage from the mSMEs for the platform O&M and a bigger one from the tech provider as a full revenue stream.
Eco-Social	The matchmaking platform has been thought for the full deployment of the local energy communities promoted by non-profit for citizens: as such they will access the platform free of charge. On the other hand, the matchmaking platform will protect and exploit big data generated, pursuant to GDPR. The advantage is that the local communities could also decide to use the platform freemium service for community's digital twinning purposes. As such, the platform settles a blueprint agreement ruling relations in the DATA triangle (a governance framework). In doing this, it will provide a rating for being part of the transitions: those players judged as not appropriate in terms of EIB Taxonomy, SDG and ESG criteria, will be filtered and not allowed. A forthcoming metric and algorithm will refine this approach in more detail.

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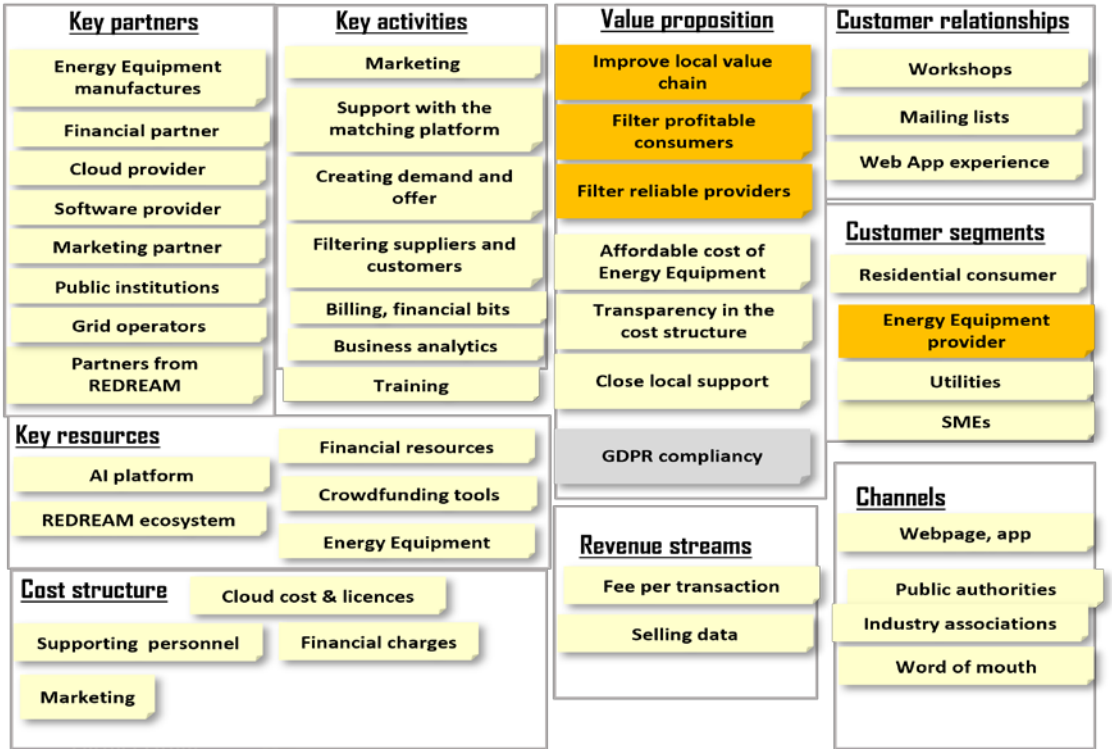

3.4 Consultancy

This business model has been thought for a DR Platform consultancy provider such as Stemy and other energy experts such as Civi, Comillas, Olivo, Rimond and Omie. It will exploit the ReDREAM platform DR Platform ecosystem. **ReDREAM DR platform advisory services for business-to-business (B2B) will sell services to professional users, owners, managers, aggregators, ESCo, DSO, TSO, EMP, and code a dedicated service channel by licencing services to their 3rd parties** (business-to-business-to-consumer B2B2C). The main revenue stream is deriving from the market advocacy services, the anonymized big data selling to third parties and other additional fees.

Value Proposition

The modularity and flexibility of the model and of the solution codebase offered by DR platform qualifies it as suitable for any type and size of customer allowing to tap into the forthcoming and growing market of the energy flexibility.

The platform works as "single-entry point" by managing the information flow between the business partners delivering the services and the potential customers. It will provide information on the capabilities of the deployed platform ecosystem, centralize customers' needs and will assign tasks/orders to the corresponding partners, to cover the specific need of each customer. If a partner cannot fulfil a specific need, due to time or capability

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	constrains, the single-entry point will identify alternative partners and will re-assign the service.
Outreach	The interface is web based and via API, the exploitation will come through the traditional promotion channels via practitioners. The platform is customer focused; the account will provide customers' request and needs by delivering the best customized solution.
Financial	Costs are related to the platform maintenance and annual fees, it has been calculated that in a multiannual budget scenario, the costs of revenues will impact for less than 60%. The revenue streams from the platform commercial deployment will come from a crowd different source and will work like the so called "Netflix" scheme, based on the service.
Eco-Social	The benefits of this advisory tools are more social than eco, such as: simplification, time, and cost reduction to answer customers' needs; easy management of the IPR (background and foreground) matters; transparency, an effective and customer-transparent way, considering the capacity building needed, the support requested and the qualification and the availability of the adequate partners.

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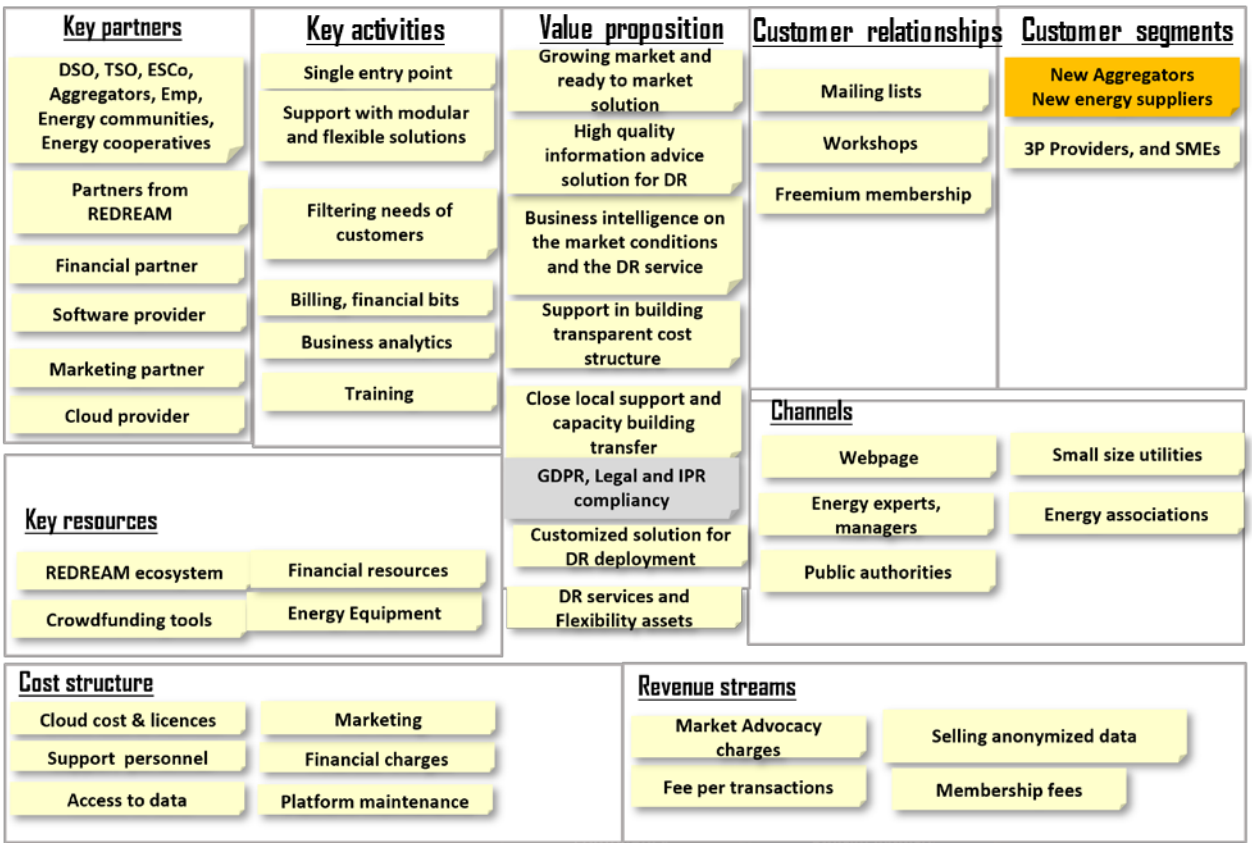

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3.5 Energy community - inner flows

This business model has been evaluated for Demos. The value proposition runs around the **development of a full local renewable energy community (even Virtual)**. A business case derived from the emerging P2P BM as described by IRENA "P2P electricity trading is a BM, based on an interconnected platform, that serves as an online marketplace where consumers and producers "meet" to trade electricity directly, without the need for an intermediary". Customers are more generally Prosumers and consumers, energy suppliers and local energy business developers. The main revenue stream comes from the percentage on energy transactions and from the energy trading, the anonymized big data selling to third parties is an additional voice. Prosumers sell their energy excess to other prosumers in a local network.

Value Proposition	For a local renewable energy community, the boundaries are one of the main features as well as the presence (and the ownership) of the Storage facility that has the advantage to enable the energy balance and the flexibility. Despite of the P2P platform designed by IRENA the presence of a centralized player (an aggregator, a DSO, or a TSO) is fundamental.
Outreach	Prosumers and member of the local energy community: P2P energy trading allows energy consumers/producers to directly trade with each other, is one of the new paradigms driven by the decarbonization, decentralization, and digitalization of the energy supply chain.
Financial	Also known as the "Uber" or "Airbnb" of energy, as it is a platform that allows local distributed energy generators to sell their electricity at the desired price to consumers willing to pay that price.
Eco-Social	The added value is the maximization of the comprehensive social welfare of the prosumers and the community itself. As a facilitator of P2P trade, an aggregator can enable automated transactions, optimize local energy use, and generate savings for consumers.

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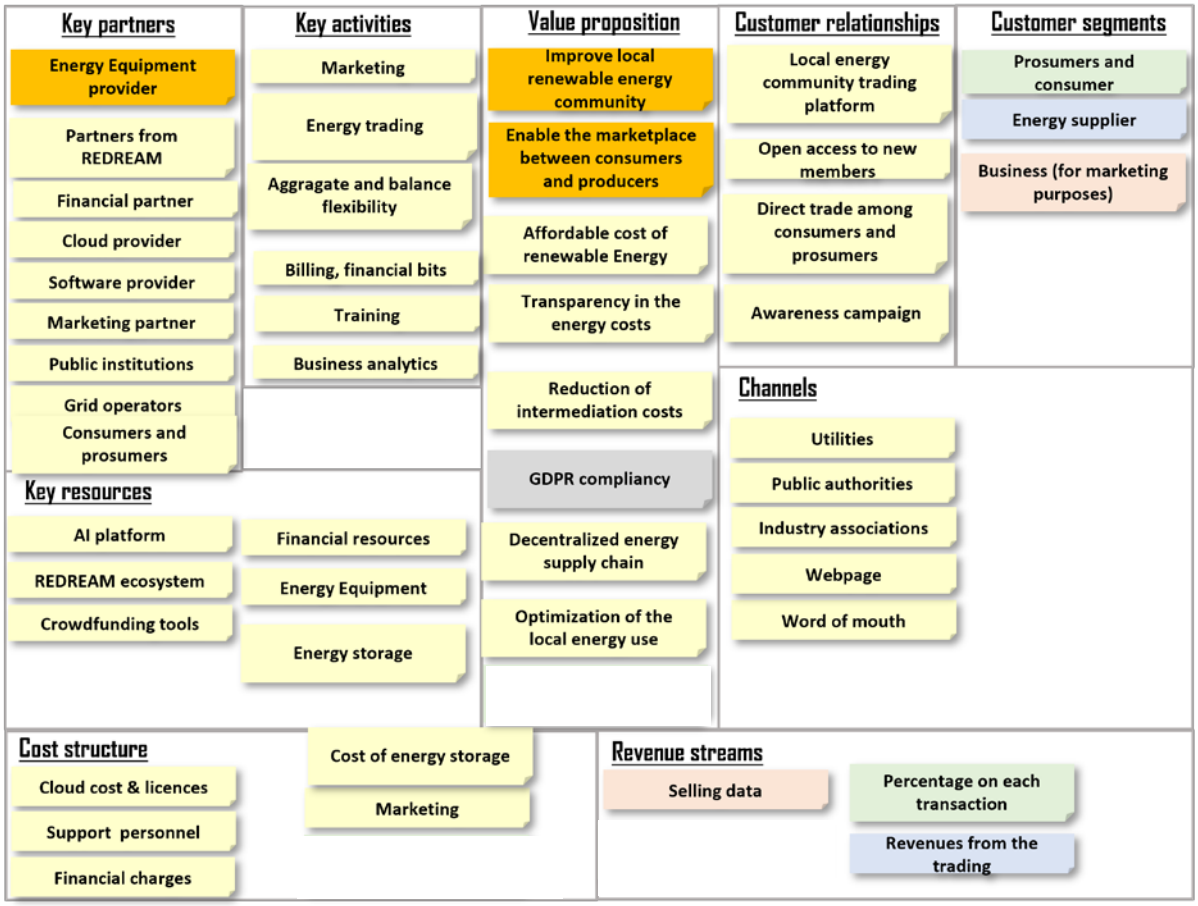

3.6 Selling Flex services

Business model is set possibly for two demos such as UK and Spain, also for other possible energy experts such as Stemy. Aggregator accumulates flexibility from Prosumers' flexible assets and sell it to the three players: BRPs, DSOs and TSOs. The value proposition is settled around the **concept of the maximization of the flexibility provided in the short term; as such, it cut the uncertainties of energy waste from prosumers by ensuring it to the market**. It means **that prosumers are covered against the business risks**. The main customers are prosumers, local energy communities and energy equipment providers, while the more consistent revenue stream is represented by selling the flexibility. Likewise renting agency, prosumers will be always paid for their individual flexibility services by the aggregator. The aggregator negotiates with BRPs, DSOs and TSOs prices of the aggregated flexibility services.

Value Proposition The Aggregator main role is to angle prosumers (flexibility providers) with energy players (flexibility buyers). It pipelines the flexibility in a portfolio and diversifies services to different market players by acting new and diverse caps (the Balance Service Provider, the Constraint Managing Service Provider, the Capacity Service Provider and even the Balance Responsible partner) serving different market

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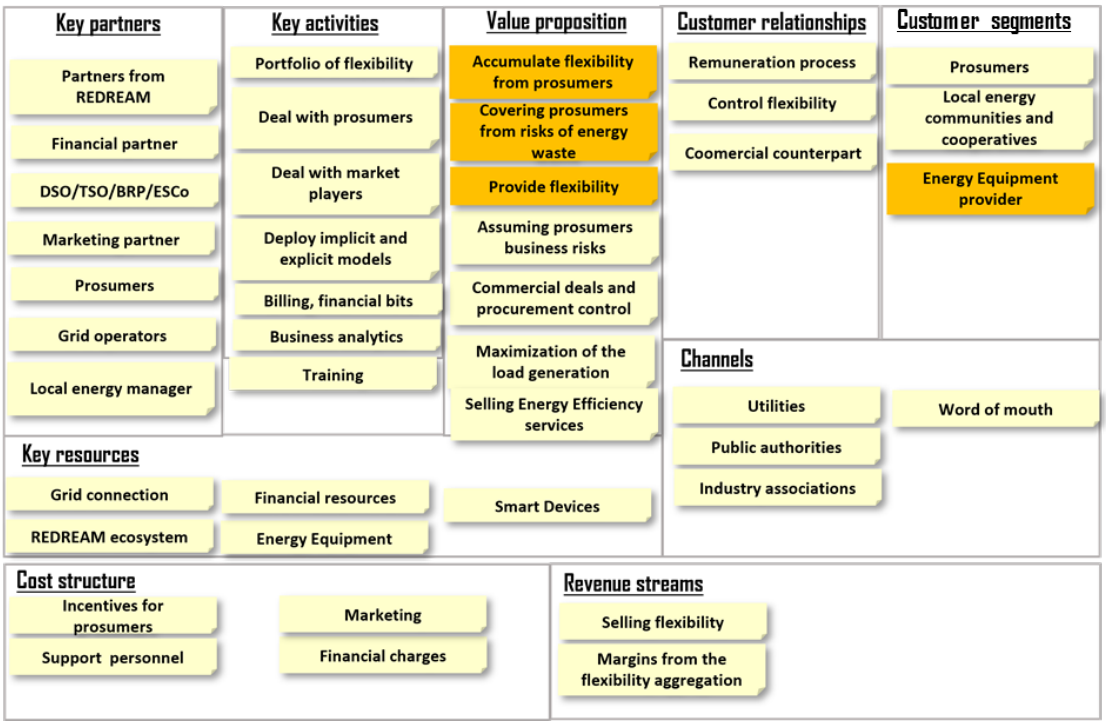
players. It is also possible to combine implicit and explicit models: as such, whether the Aggregator (responsible for explicit) and the ESCo (responsible for implicit) could be the same or different entities.

Outreach The Aggregator cares about the remuneration process derived from aggregate the prosumers flexibility: as such, they close a deal on commercial terms and conditions for the procurement and control of flexibility.

Financial The most consistent revenue stream is the earnings from the flexibility to be shared. As well as the costs are related to the incentives for prosumers for sharing flexibility and maximize their load or generation.

Eco-Social The most valuable role of the aggregator is to provide non-financial value in return to prosumers and active member of the local community by providing insight into consumption patterns or providing home energy managers, etc.



3.7 Energy community - solar fields or extra services

This proposed business model has been evaluated for demo cases. A variation of the aggregator model is given by the EU Clean Energy Package enabling the community-based solutions allowing aggregators to lower their transaction costs and to provide different solutions to such communities. As such, for

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ReDREAM demo cases and thanks to the 2019 EU Electricity and the Renewable Energy Directives that has designed (renewable and not) citizen energy communities, it will be possible to **generate value locally and to promote a community-based consumption, sharing and sale of locally produced electricity.**
As a result of the Brexit process, the UK will be no more under EU legislation. Concerning the concrete application of this case, it is necessary to further assess the impacts on the proposed business model.

Note that in this BM the customer relationship is not with individual prosumers, but with already existing energy communities that aggregate hundreds of them.

Value Proposition	There is an imposed operation limits related to the possible undertaking actions: generation, even from renewable, distribution, supply, consumption, aggregation and energy storage, energy efficiency services or e-vehicles charging and dis-charging. It must be a legal entity with a legal authorized representative; this possibility has been enlarged to a group of individual shareholders (the cooperative) or to an aggregator. Principal activities are responsibility for remote control, for the billing, and for market participation or grid service provision. Since the core is the community concept a shared use of large standalone PV system, large battery storage, or a combined fuel cell system is more viable in the business plan and economic multiplier rather than single individual process. The focus of this BM will be on community's business ability to use their local links, trust and track record to increase number of prosumers engaging with platform and offering flexibility. Income for community business to deliver service comes from a share of flexibility income and householder subscription with platform.
Outreach	The market liberalization tends to allow community consumers to switch supplier at any time: but so far, the EU framework does not allow that. It means that suppliers should share his responsibility for a customer's metering point with a customer's neighbour through a community scheme or an aggregator. In UK regulator allows "the main" supplier be notified to keep track of energy feed-in and withdrawal, to ensure a supplier does not incur imbalances through other actor's actions
Financial	The financial attractiveness needs network tariffs to be lowered, because together with prosumers there are locally consumers reducing the network stress. DSOs would reduce network tariffs to CEC or REC

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when exchanging self-generated energy locally because they minimize the use of the higher voltage levels of the network. In principle, a community-based process could face upfront costs looking at its self's crowd, in terms of capex match. Alternatively, a community solution requires incentives to invest in DER technologies: suddenly, suppliers and aggregators loans them. The revenue stream needs a sufficient scale, for example an aggregator could connect multiple communities to extract sufficient value. The aggregator could charge a monthly service fee for its operations or offer community members a beneficial electricity tariff while overseeing the remaining supply that a community cannot cover locally. There is the possibility to draft a profit-sharing scheme with the community where an aggregator oversees providing community resources to different markets and services, and the community can select its degree of flexibility and level of risk exposure. In Germany prosumers sells electricity without a supplier license if they do so locally as part of the "direct sale". In UK, the regulator with a market operator is working on the rapid supplier switching allowing the procurement of energy from multiple suppliers.

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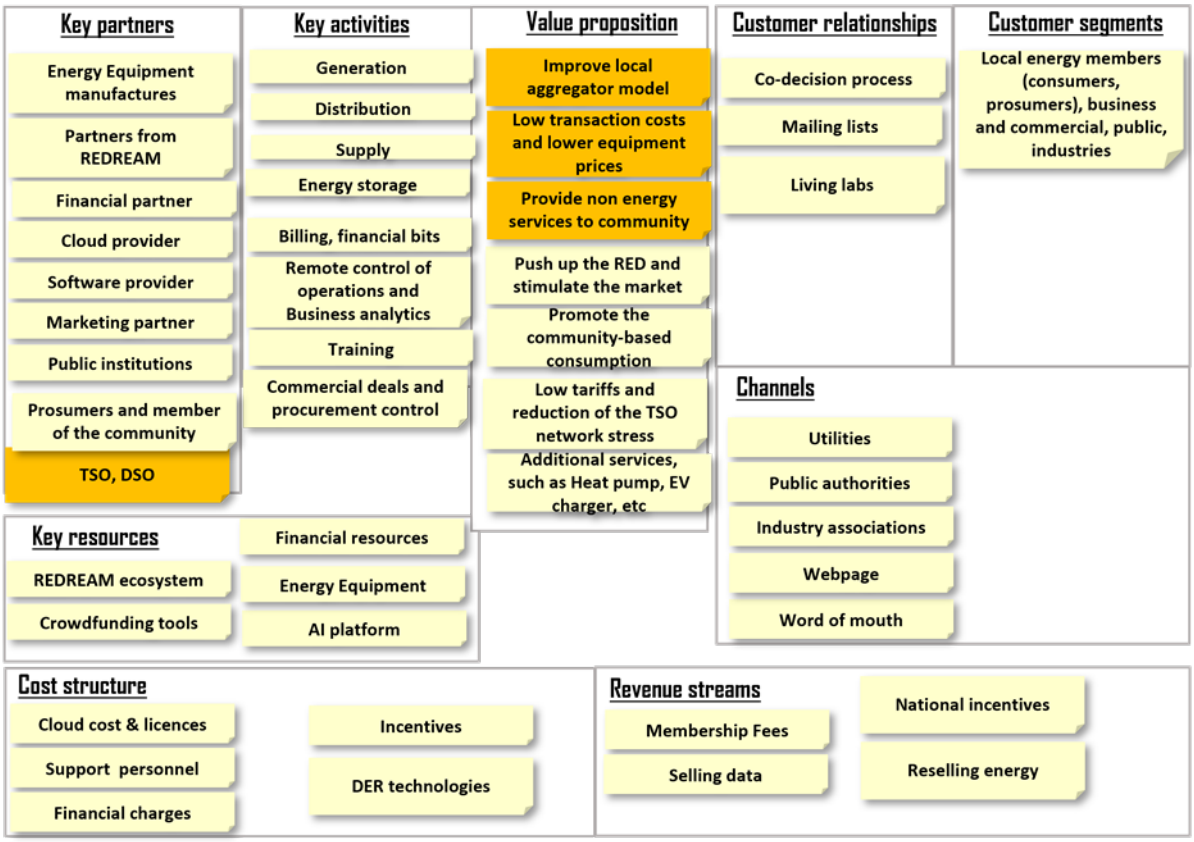

3.8 Improving energy efficiency and well-being

This business model has been thought for a pure ESCo partner such as Civi and other possible energy experts such as Olivo and Zez. The transition from the traditional to an enhanced model[26] (leveraging the Flexibility and demand-response), **represent a new widespread economic model: it is taking shape that reverses the pyramid of energy and information distribution, as such the space has been created to apply a sort of territorial "Keynesian" income multiplier that considers both the economic and the socio-cultural effect.** From this point of view, the efficiency enhancements in the public sector reach the goal of involving the communities and demonstrating the goodness that they can have if applied on a large scale also to the private sector.

[26] https://novice-project.eu/

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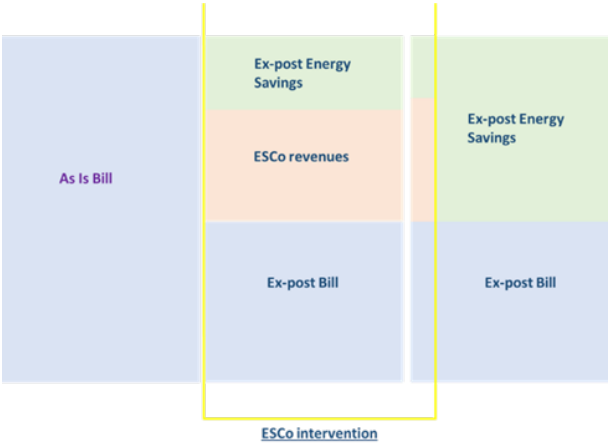

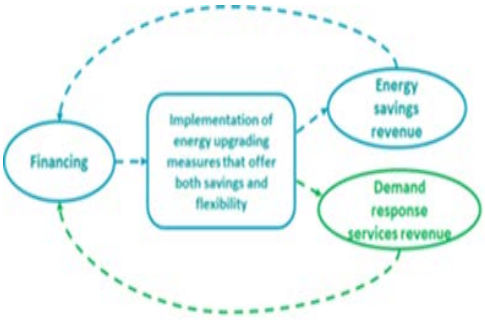

Value Proposition

ESCos develop energy efficiency both in the public and private sectors with a logical and effective approach that we can summarize as follows: consistent collection of data on energy consumption; analysis of the same and proposal of interventions with the related time schedule (Energy Audit); functional technical solutions for achieving the goals of reducing consumption expressed in the energy audit; economic sustainability, the technical solutions identified to favour improvements must be economically sustainable. The key partners are local DSOs, network regulators, installation companies and sub-contracting partners. Prosumers and dwellers are also key partners. The competitors are companies that offer a similar value proposition to the customer. An important mix of partner/customer could be the managing subject of the energy community.

Outreach

Households with the need for energy as well as auxiliary services like smart loading of their EV. DSO with shortage in securing grid stability are potential customers for flexibility of the customers.

Financial

Investments in RES generators equipment and general civil works for connecting to grid, O&M and building refurbishment, ICT devices and appliances, load infrastructure for the EV and other RES system. Marketing and payback to prosumers/customers for their flexibility.
The enhanced model could maximize the revenue stream side: bundled procurement of the flexibility to the DSO and on the energy exchange; the procurement of households with heat, electricity, and ancillary services.

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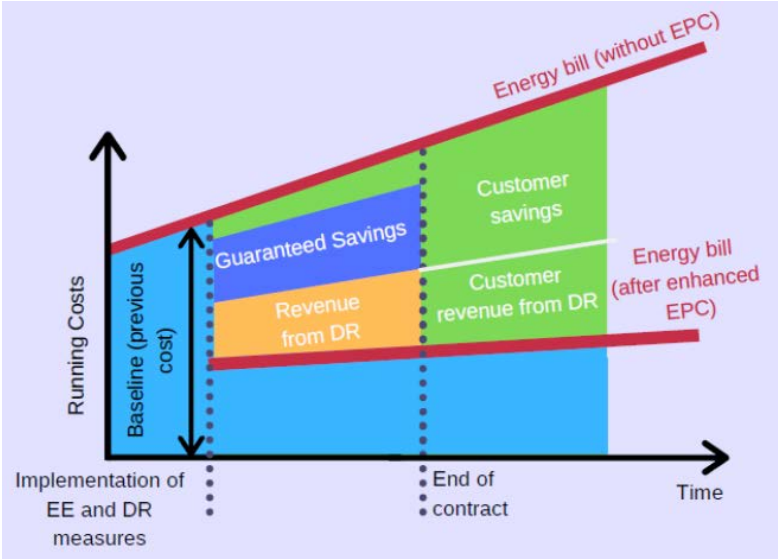
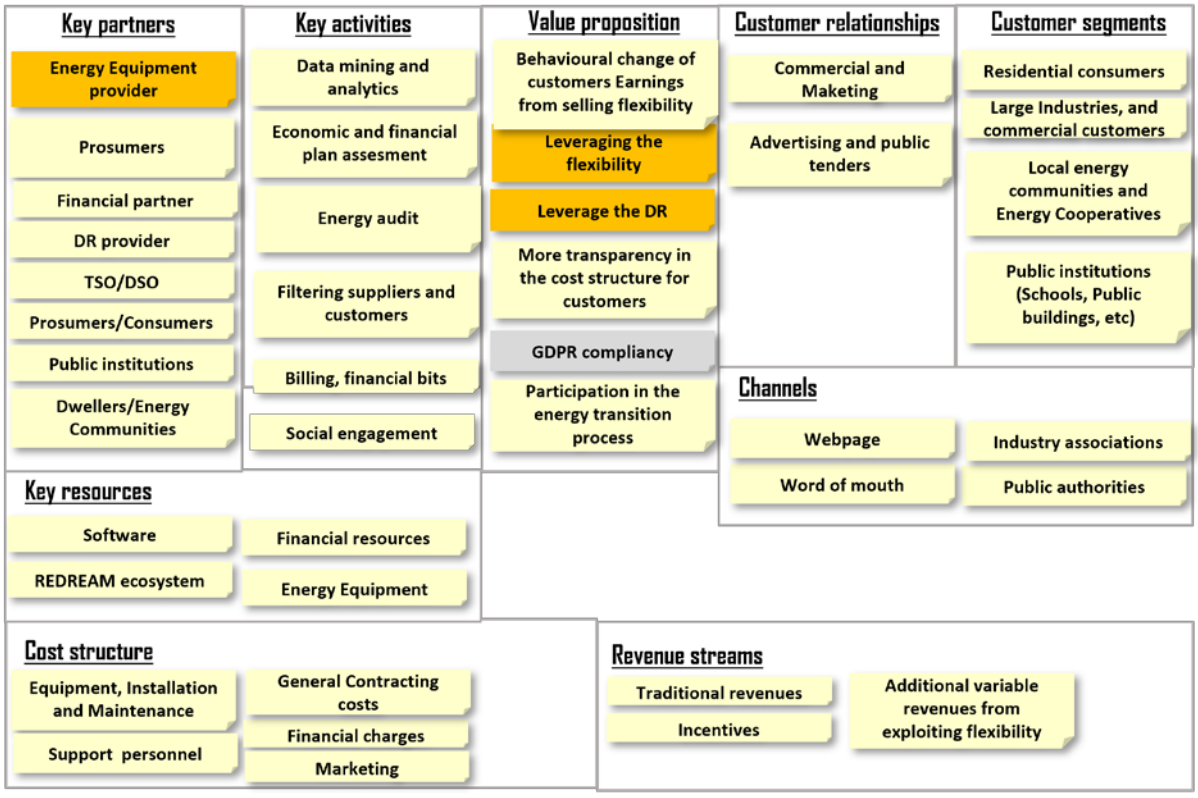


Eco-Social The simultaneous innovation in the energy, communication and transport sectors has historically resulted in increased productivity levels to support growth.



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3.9 Vehicle2Grid

This business model has been designed for those partners having the possibility to create an SPV with ESCos, such as Biodistretto and Civi. Thanks to the ReDREAM platform ecosystem, it will be possible to ask services such as the electro mobility, and consequently act as Electromobility provider. The **energy flexibility and the demand response** enable the SPV to provide customers such as public authorities, households, and industrial/commercial/business players to add the e-mobility to their EPC contract. The main revenue stream is deriving from the additional fees to the EPC per mobility transactions and the big data selling to third parties.

Value Proposition	An energy service company could couple its contractual form (the energy performance contracting) with the EV charging and scale it with the V2G model. ESCo could offer add-on the EPC framework as new energy services on charge. The energy vector, not the vehicle itself, used to start the vehicle is responsible for climate-altering emissions, while emissions from e-vehicles are 0 if the energy is powered by renewable sources. The electric vehicle battery is used for flexibility.
Financial	Wall-boxes, e-charging points, and civil works, together with bailment of e-vehicle are the major costs. Inside an EPC framework, EV charging creates new revenue streams while enabling the stabilization of the demand on the grid when renewable energy production causes volatility. In that case the scalability of the model could be added with the bidirectionality given by the V2G model, exploiting the dis-charging.

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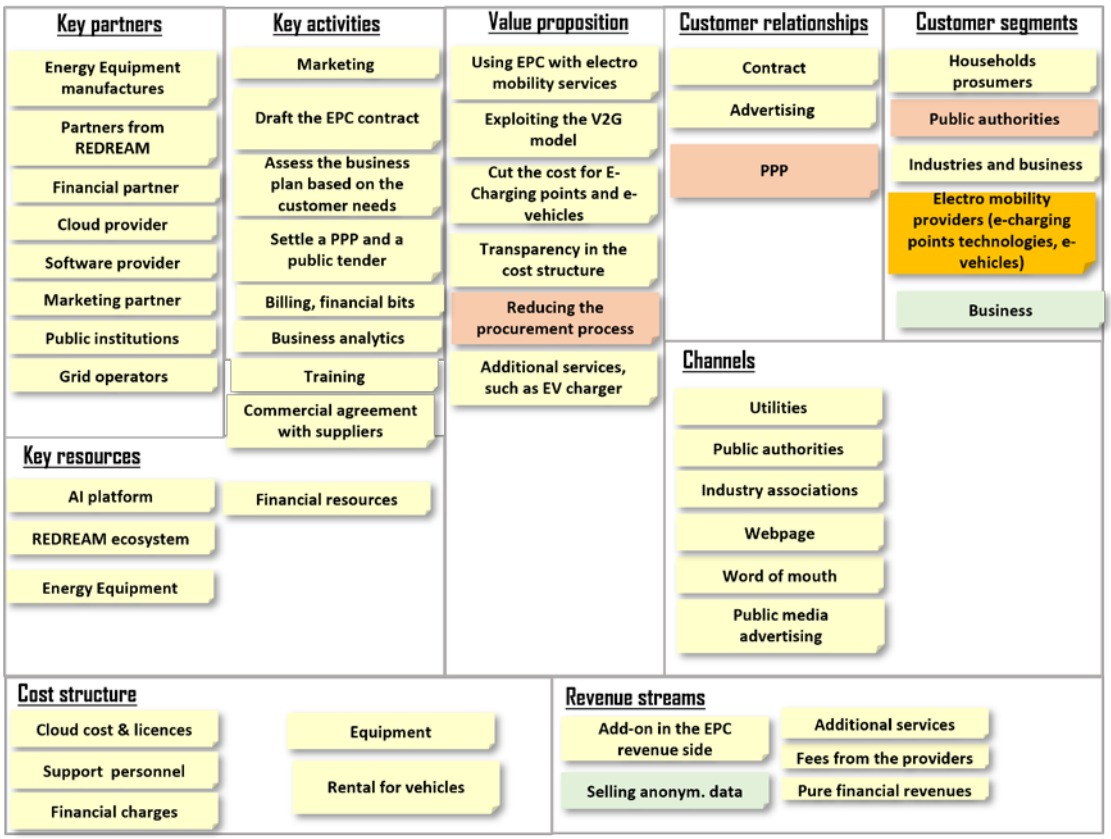
Identification, presentation and selection of business models

[3rd November 2021]



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4 Conclusion

As described in the report and surfing the mainstream hype of innovation paved by the new EU legislation, the new dynamic energy systems is more digital, more transparent, more democratic, and more bottom up, rather than the traditional energy system. Digital energy platforms coupled with the distributed renewable generation, are stimulating a huge number of business cases. Maybe the profitability of each of them is not pyramid-shaped: earns are less but distributed even generating social benefits.

It will be a fundamental asset whether at local community it will be possible to decode and monetize the energetic transition process at local scale and the subsequent benefits (not only economic and financial one, but even social and environmental). As such, such kind of business models are requested to take duly care of the local value-chain (as much greener as possible) and of the local eco-systems and partnership: territories and companies of all size need to be connected in the same loop creating new governance models.

The report has looked at the emerging trends and defined a set of viable and sustainable business models pointing out that they should be from the one side coupled with innovative public/private funding schemes and from the other side adapted to the four ReDREAM demonstration sites.

Being the first step of an iterative and shared path, the report is considering the first chapter of fourth, being integrated with the funding side, the assessment side, and the exploitation strategy. Indeed, this deliverable is focused on the business intelligence activities for market up-scaling: it will be coupled with a catalogue of viable and proper funding and financing scheme (Task 6.2 and deliverables 6.2, 6.3, 6.4 and 6.5). Afterwards, the Work Package will perform the scalability and replicability analysis of DR solutions deployed: if they could be scaled-up and replicate, and what if in case of different use cases.

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Annex 1: Web sources

a) Business model canvas and general issues

https://www.sciencedirect.com/science/article/abs/pii/S0959652620345832

https://www.irissmartcities.eu/content/smart-city-business-model-canvas

https://www.mdpi.com/1996-1073/12/24/4798

https://e3p.jrc.ec.europa.eu/articles/energy-performance-contracting

https://www.iea.org/reports/key-world-energy-statistics-2020?utm_source=SendGrid&utm_medium=Email&utm_campaign=IEA+newsletters

https://www.bis.org/publ/othp31.pdf

https://onlinelibrary.wiley.com/doi/abs/10.1002/wene.384

https://www.fi-compass.eu/sites/default/files/publications/European%20Structural%20and%20Investment%20Funds%20%28ESIF%29%20and%20Energy%20Performance%20Contracting%20%28EPC%29_0.pdf

https://www.afme.eu/Portals/0/DispatchFeaturedImages/AFME%20CMU%20Key%20Performance%20Indicators%20Report.pdf

https://www.viiconference.org/wp-content/uploads/2018/09/Binder2a.pdf

b) Positive Energy District, Local Renewable Energy Community, Energy Trading Platform

https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2020/Jul/IRENA_Peer-to-peer_trading_2020.pdf?la=en&hash=D3E25A5BBA6FAC15B9C193F64CA3C8CBFE3F6F41#:~:text=P2P%20electricity%20trading%20is%20also,willing%20to%20pay%20that%20price.

https://jpi-urbaneurope.eu/app/uploads/2020/03/PED-Booklet-Update-Feb2020_.pdf

https://www.sciencedirect.com/science/article/pii/S1364032118307184

https://www.tymlez.com/next-generation-autonomous-energy-trading-platform

https://www.wepower.com/project-owners.html

https://www.ez-nergy.com/energy-trading-platform/

https://medium.com/suncontract/p2p-energy-trading-on-the-suncontract-platform-bfa5f85d8cb0

https://www.brooklyn.energy/

https://doi.org/10.1016/j.apenergy.2020.116123

c) Vehicle to Grid and electromobility

https://www.virta.global/blog/business-ideas-in-energy-sector

https://www.accenture.com/t20161123t024458z__w__/in-en/_acnmedia/pdf-37/accentire-electric-passenger-vechicles-11-8-16-pov.pdf

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Identification, presentation and selection of business models

[3rd November 2021]

https://www2.deloitte.com/us/en/insights/focus/future-of-mobility/power-utilities-future-of-electric-vehicles.html#

https://www.iea.org/reports/global-ev-outlook-2019

https://www.researchgate.net/publication/283677548_New_business_models_for_electric_mobility

d) Virtual Power Plant

https://www.next-kraftwerke.com/energy-blog/business-model-virtual-power-plant-vpp

http://energeia-usa.com/wp-content/uploads/2016/08/Virtual-Power-Plant-Business-Model-Costs-and-Revenues-Due-Diligence.pdf

https://iiot-world.com/connected-industry/business-models-and-market-participation-for-virtual-power-plants/

https://lo3energy.com/

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