BestRES

Best practices and implementation of innovative business models for renewable energy aggregators

European workshop "Aggregators as enables of prosumers participation in the energy market"

European Utility Week, Messe Wien

Vienna, 6th November 2018

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www.bestres.eu

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 691689.

Acknowledgement

This report has been produced within the BestRES project "Best practices and implementation of innovative business models for Renewable Energy aggregatorS".

The logos of the partners cooperating in this project are shown below and information about them is available in this report and at the website: www.bestres.eu

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Table of contents

BestRES This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 691689.

List of Figures

BestRES This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 691689.

List of abbreviations and acronyms

BESS - Battery Energy Storage System

BM - Business Model

BRP - Balance Responsibility Party

DR - Demand Response

FCR - Frequency Containment Reserves

mFRRda - manual Frequency Restoration Reserve directly activated

ToU - Time of Use

VPP - Virtual Power Plant

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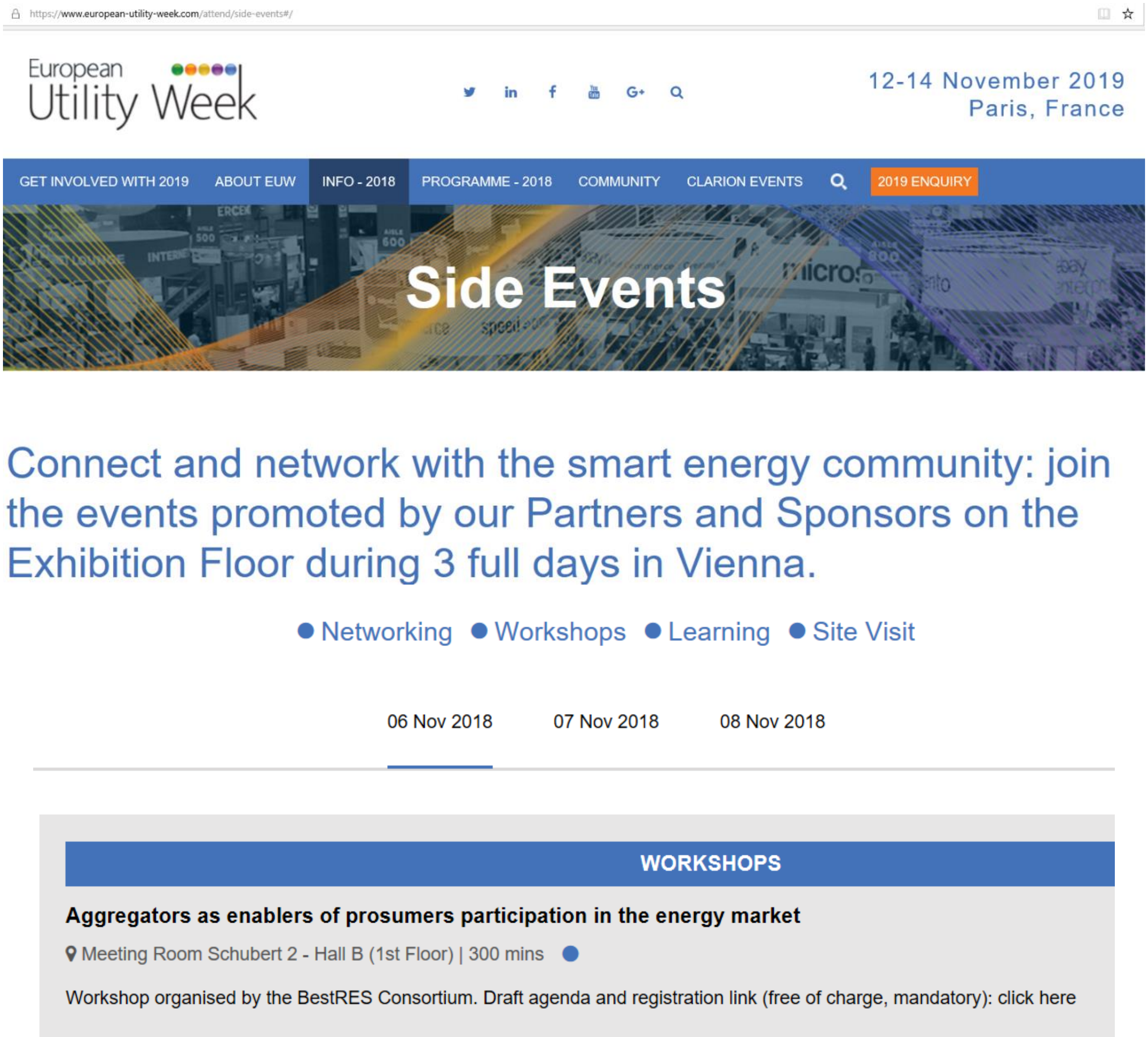
Executive Summary

The workshop was organised in Vienna, Austria, on the 6th November 2018, as a side event at the European Utility Week (https://www.european-utility-week.com/attend/side-events#/)



The workshop had the aim to provide the projects partners with the opportunity to disseminate the results from the third stage of the project related to the real-life implementation of the improved business models and associated results so far.

During the workshop, the BestRES project partners provided the participants with an overview on the project, on results already obtained during the on-going activities related to the implementation and monitoring of improved business models.

The workshop was very interactive with some interesting questions and valuable input from the audience. The BestRES workshop also included an external speaker Mr. Ioannis Lampropoulos to give the point of view of aggregation activities in the Netherlands. The moderator for the workshop was Hubert Fechner, Program Director Renewable Urban Energy Systems and Head of Department of Renewable Energy at the University of Applied Science in Vienna as well as representative of the IEA PVPS as Vice-Chair Strategy and ExCo Austria.

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All presentations and related documentation shown during the workshop have been sent to the participants. The list of registered participants is attached to these minutes. The agenda of the workshop is also provided as an Annex.

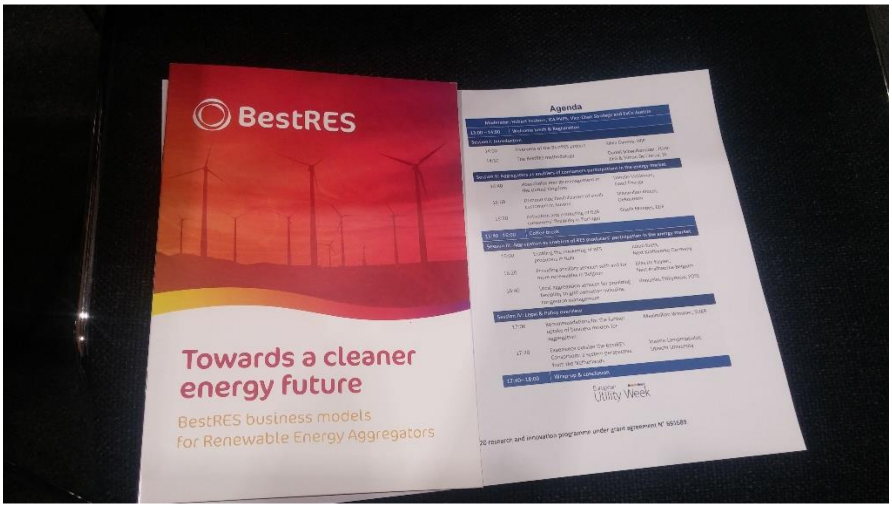

Figure 1: Material distributed during the BestRES workshop

The workshop was structured in the following four sessions moderated by Hubert Fechner:

- Session I gave an overview of the BestRES project and the methodology used.
- Session II focused on the implementation of the business models, related to enabling consumers participation in the energy market i.e. demand.
- Session III focused on the business model implemented that enabled the participation of distributed renewable energy sources on the various markets i.e. the generation side.
- Session IV gave an overview of the legal & policy landscape within Europe regarding aggregation

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Summary of the presentations

Session 1: Introduction

Overview of the BestRES project

Silvia Caneva (WIP) introduced the BestRES project explaining the objectives of the project as well as introducing the various partners from the BestRES Consortium.

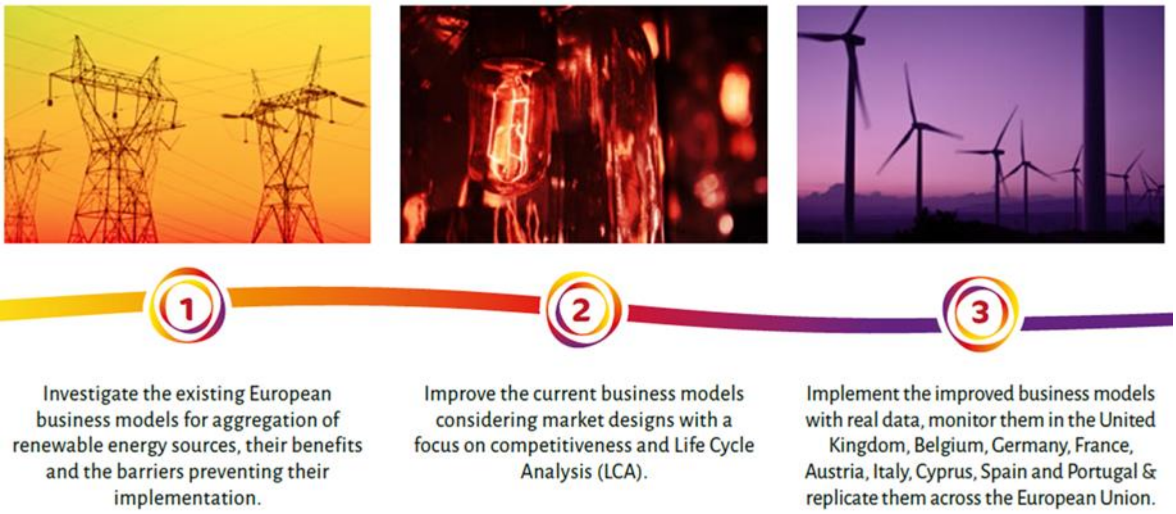

Figure 2: Stages of the BestRES project

Silvia (WIP) explained the various stages of the project and the relation towards the workshop. The focus of this workshop was to disseminate the results of stage 3 achieved thus far i.e. the implementation of the improved business models with real data.

The BestRES Methodology

Daniel Schwabender (TUW-EEG) & Simon De Clercq (3E) introduced the methodology of the project with a definition of an aggregator from the BestRES project as "*legal entities that aggregate the load or generation of various demand and/or generation/production units and aim at optimizing energy supply and consumption either technically or economically*".

Daniel (TUW-EEG) explained the roadmap of the project:

- First stage: identify existing European aggregation BMs and related benefits and barriers
- Second stage: develop improved BMs and decide if BMs are ready for implementation
- Third stage: test and implement BMs including development of recommendations

Daniel outlined that it is now in its final stage i.e. Stage 3: test and implement BMs including the development of recommendations.

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For the first stage, the consortium used the Business Model Canvas (BMC) developed by Osterwalder et al. This helped map and identify existing European aggregation business models.

The BMC was then used as a basis to improve the various business models in stage 2. These improvements were based on the regulatory environment that the associated business model was located. In response to a question from the audience, Daniel (TUW-EEG) explained that the starting point for many improved business models were from ideas of participants within the consortium. The project aimed to investigate the viability and feasibility of these proposed business models, while offering added value through suggested improvements. After an iterative research process, 9 possible business models were identified. These were firstly separated based on economic viability as shown in Figure 3.

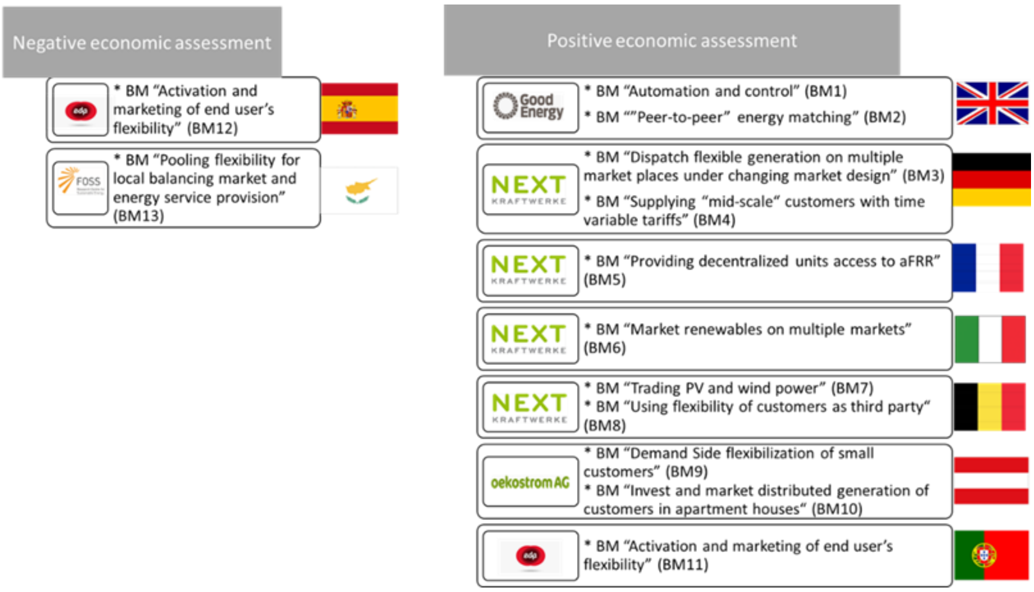

Figure 3: Economic assessment of the various business models

A barrier analysis each business model was categorized based on its readiness for market testing.

- Group 1 – BMs ready for implementation
- Group 2 – Improved BMs economically viable but with barriers that prevent implementation in the short term
- Group 3 – Improved BMs that are not economic or face substantial barriers

Simon (3E) briefly introduced group 1 – BMs ready for implementation. The following business models were identified as having no significant barriers for implementation.

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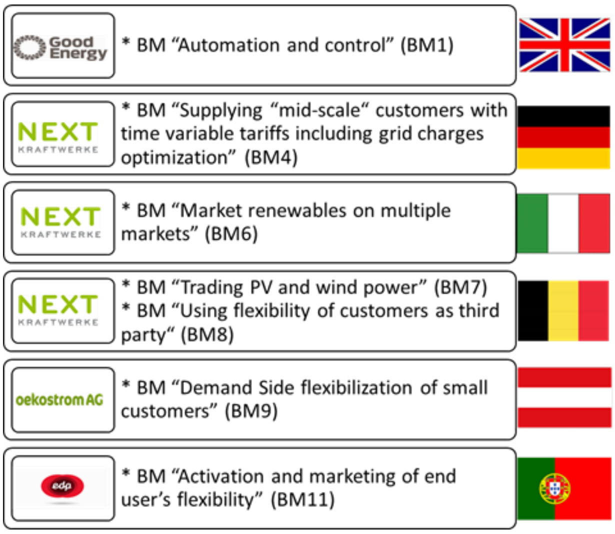

Figure 4: Business models ready for implementation

Simon (3E) explained the various ways that the different business models generate revenues. For example, the business model for Next Kraftwerke (Belgium) generates revenues from capacity and activation fees on reserve power markets and on intraday and day-ahead markets.

The major challenges identified for aggregators with business models ready for implementation were as follows:

- Acquisition of sufficient number of interested clients/providers of flexibility (that have smart meters)
- Regulatory changes and unclarities
- Unfavourable/ unstable price evolutions

The following business models were deemed not ready for implementation.

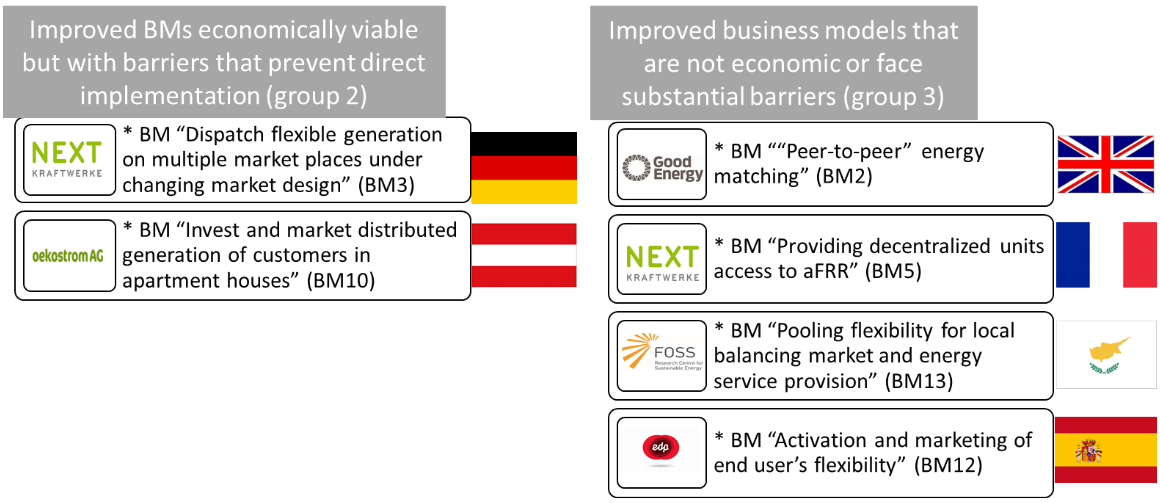

Figure 5: Business models facing significant barriers

For all above identified business models not ready for implementation, the main hurdles are related to regulation:

- Regulatory barriers in the short to medium term: group 2
- Regulatory barriers in the long run: group 3

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Simon (3E) concluded his talk highlighting the fact that the project is now proceeding with the final stage related to the testing and implementation of the improved business models. This stage will lead to the development of recommendations for market design and regulations.

Session II: Aggregators as enablers of consumers participation in the energy market

This session focused on the business models concerning the flexibilization of small-scale consumers.

Household energy management in the United Kingdom

Danelle Veldsman (Good Energy) began her presentation by introducing Good Energy and the company's mission, 'Powering the choice for a cleaner, greener future together'.

The related business model being implemented in the pilot stage was a household energy management system that included the installation of verve technology into 50 participating households. The home innovation trial consisted of three stages:

1. Energy Basis (one month)
2. Energy awareness (two months)
3. Energy Attention (six months)

The first stage consisted of collecting baseline data on the customers load profile and energy needs. This was supplemented by a customer survey in order to understand their needs and expectations from the trial.

The BestRES project offered a chance to investigate the measured impact of access to real time data for the end user. Danelle (Good Energy) illustrated the two types of behaviour that can influence energy consumption.

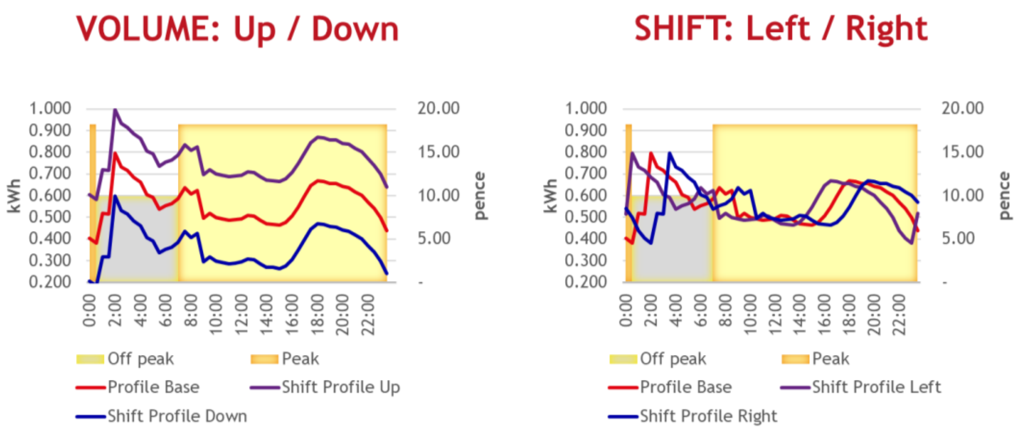

Figure 6: Load response to incentives

The end user can alter their behaviour in response to incentives by either:

1) Shifting their load up or down. In this way the total volume of the consumers load is changed. Thus, the peak load is either increased or decreased.
2) Shifting their load left or right. This will lead to consumption taking place in either peak or off-peak times. However, the peak load remains the same.

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Several results of the home innovation trial were presented (Fig.7).

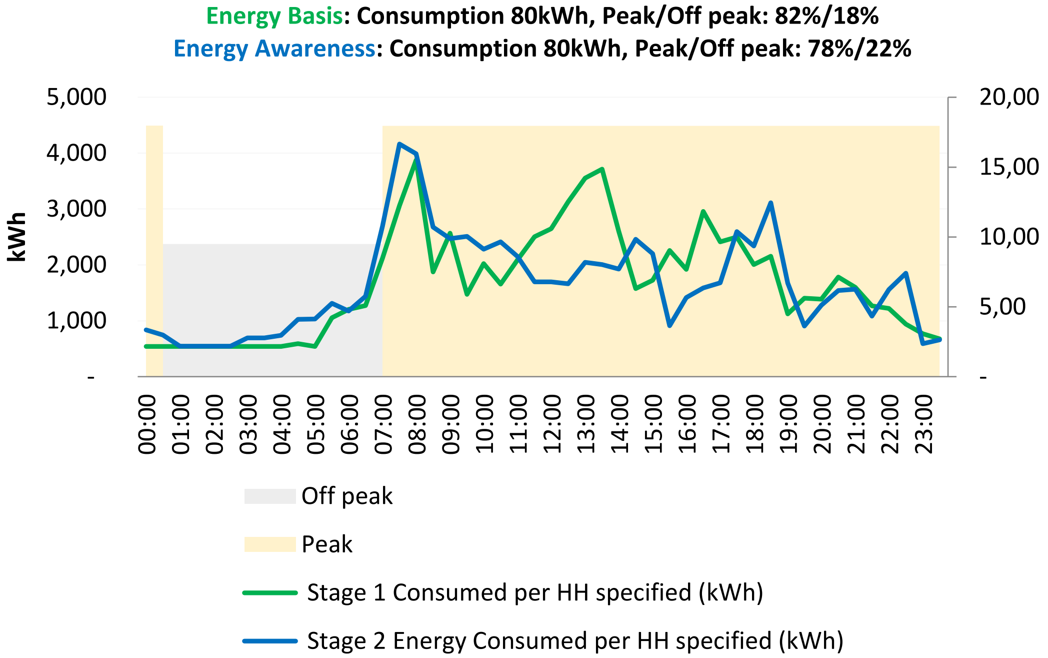

Figure 7: Daily consumption profile during Energy Basis and Energy Awareness

The above result presents the daily consumption profile of a household during the two stages of the projects implementation. It was concluded that the trial period is still too short to draw any conclusive evidence the on resulting effect of energy consumption given access to real time data.

The following table presents the trial period results in terms of user engagement and app analytics. The results indicate a genuine interest from the end user into real time data regarding their energy consumption.

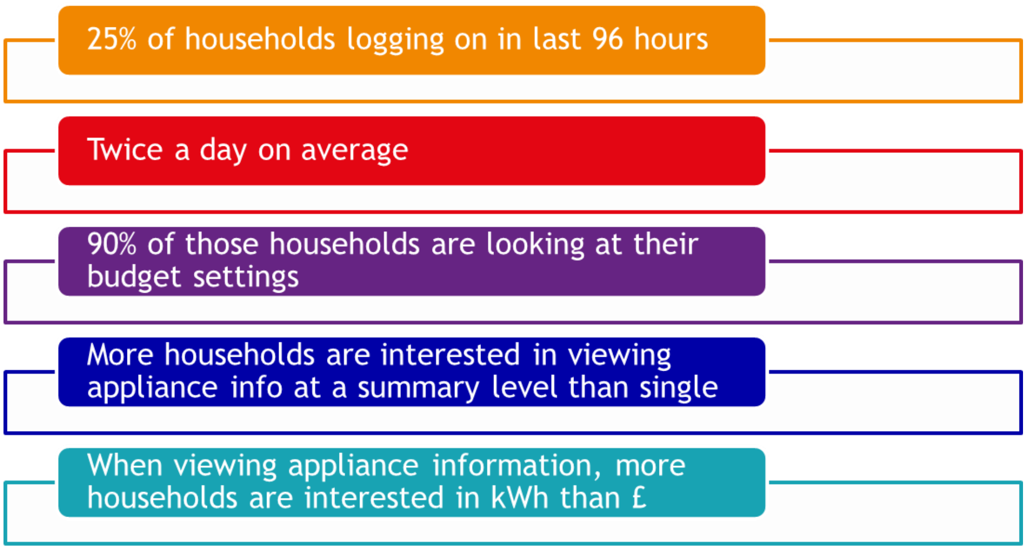

Figure 8: App analytics result

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Danelle (3E) highlighted the load shift potential of household customers. This flexibility was identified from the disaggregated load profile results of households in the home innovation trial.

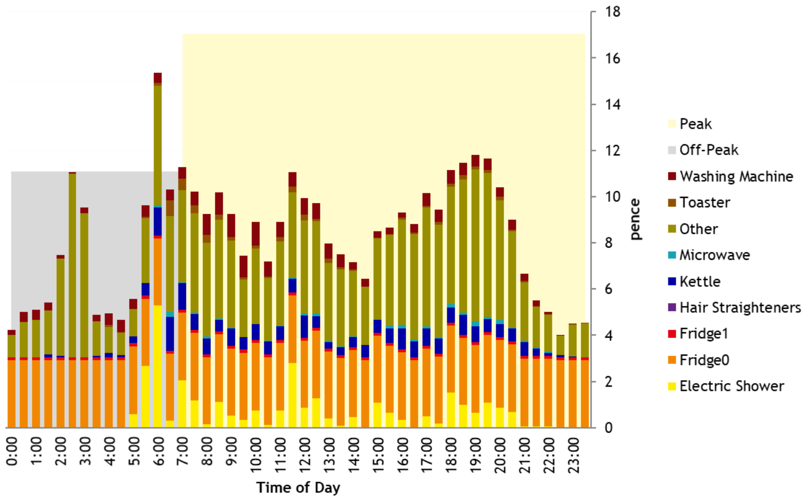

Figure 9: Disaggregated load profile

A 7% load shift potential was identified. This potential flexibility could be activated via:

- Shifting washing machine load into off peak
- Shifting all other load with one half hour from peak to off peak

This BM would be based on a static time of use (ToU) tariff (2 rate), by activating their flexible load, it was estimated that it would lead to a £4.20 potential yearly saving per Household.

Danelle (Good Energy) concluded her presentation illustrating the potential savings for UK households based on an optimised static ToU tariff, in the future energy market.

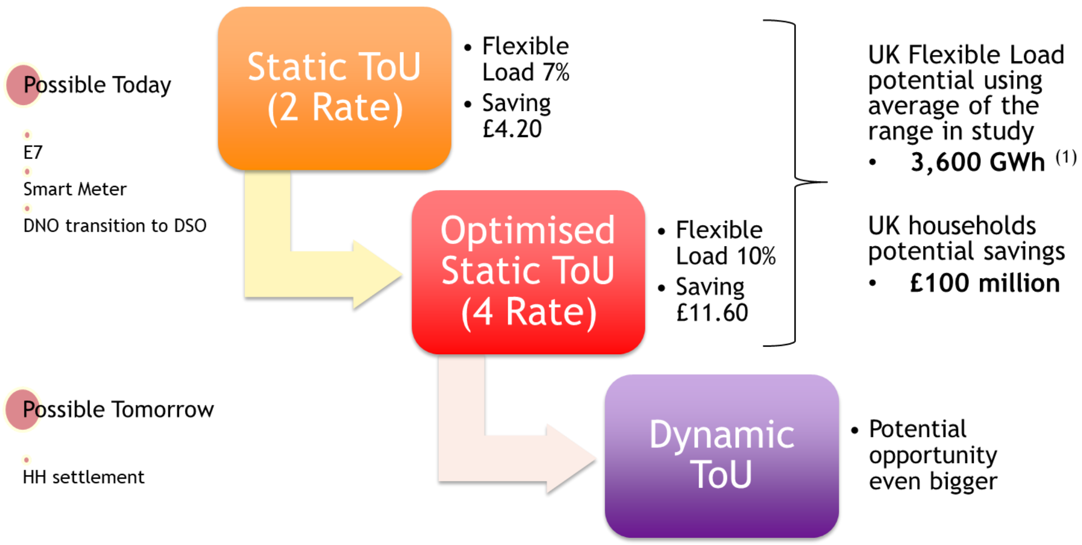

Figure 10: Potential of Time of Use (ToU) tariffs

It was highlighted that thus can result in 3,600 GWh of potential flexible load available for UK generating £100 million of potential savings for UK households.

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Activation and marketing of B2B customers' flexibility in Portugal

Although there are several technical, market and regulatory barriers in Portugal, EDP is investigating the feasibility of demand schemes with a focus on B2B customers' flexibility.

Gisela Mendes (EDP) presented the results. Firstly, she gave an outline of the current market situation in Portugal:

1. Currently, there is no regulatory framework for demand response aggregators
2. Real time consumption data and the required infrastructure to implement DR is very limited
3. Energy markets provide little options for aggregators

EDP's business model is based on marketing the client's flexibility in addition to supplying the customers with electricity

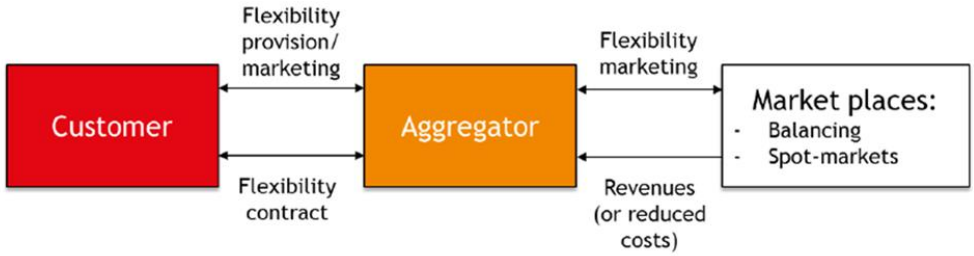

Figure 11: EDP business model

The case study has been validated through two different approaches: simulations and a demo pilot in Lisbon.

The demo pilot in Lisbon is investigating the potential of HVAC systems of services buildings as flexibility providers. The pilot case study involves three stages:

1. Determine the thermal inertia of the building at each time interval
2. Calculate the available flexibility, while ensuring the thermal comfort of the building
3. Identify ways to create new revenue streams

The preliminary results show the existence of flexibility from HVAC system without real impact on occupants' thermal comfort.

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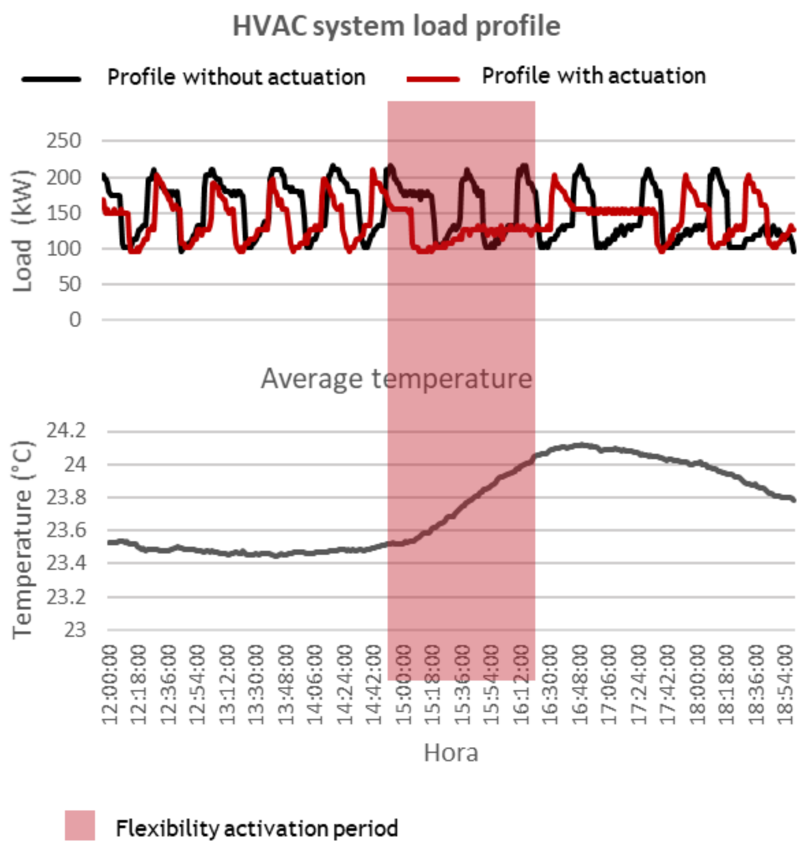

Figure 12: Flexibility of HVAC system load

The second approach to this business model implementation is to determine the optimal despatch of flexibility, based on simulations run by the Technical University of Vienna.

The simulations considered three different customer loads (Heat, Water & Other), three flexibility profiles and three scenarios. The flexibility profiles and the three scenarios are illustrated in the following two figures.

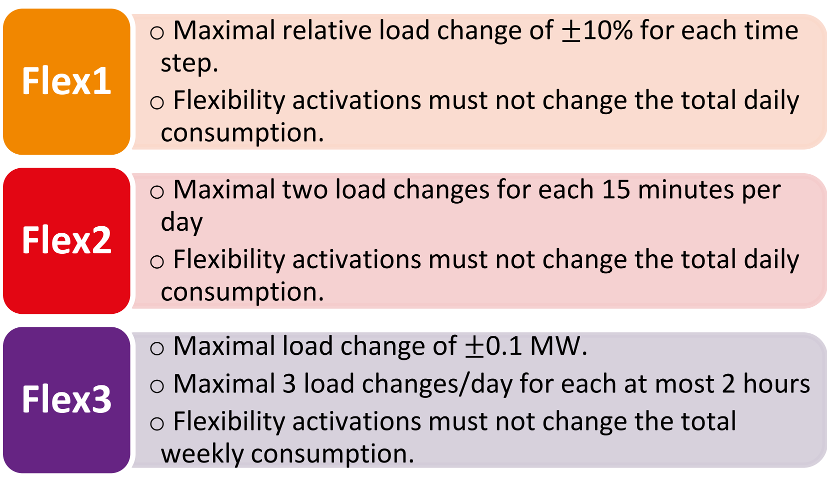

Figure 13: Flexibility profiles considered

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Scenarios

Spot: The flexibility is used exclusively to reduce electricity purchase cost from the day-ahead spot market.

Imbalance: Available flexibility is used to reduce the deviation of EDP's portfolio.

Optimal - Theoretical optimum: The model chooses the optimal marketplace for the flexibilities, depending on which option provides more cost reduction. It's and unrealistic scenario because imbalance prices are only settled after reserve market activations.

Figure 14: Scenarios considered

Gisela (EDP) then presented the result of the simulations. The savings strongly depend on the load profile and flexibility pattern. Flexibility activations lead to similar savings for spot and deviation (imbalance) scenarios. Unsurprisingly, the optimal scenario delivers the best results.

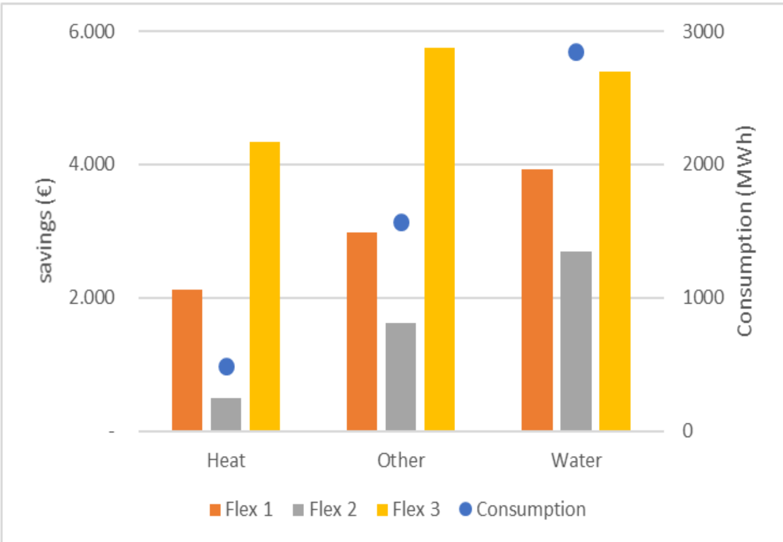

Figure 15: Savings under Optimal Scenario

The following results illustrates the potential value of the identified flexibility on the market. This case represents the optimal scenario.

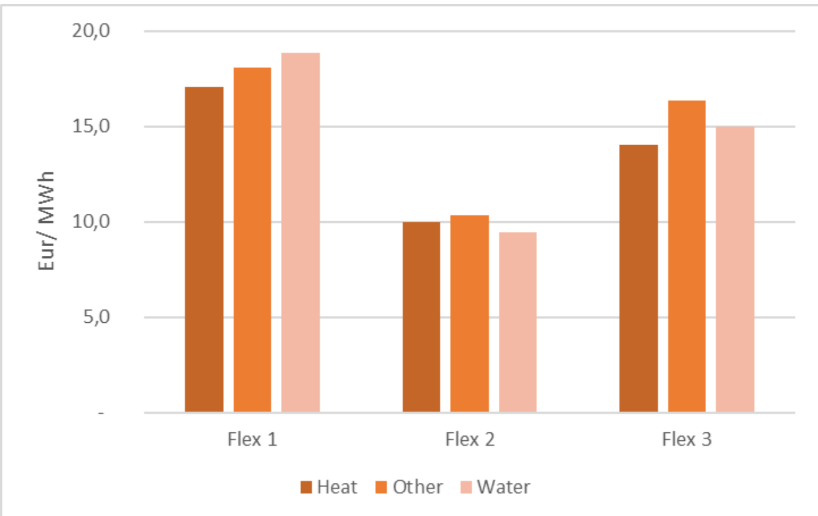

Figure 16: Optimal scenario flexibility valorisation

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Based on the above flexibility valorisation, it was then investigated how best to compensate the clients for being providers of flexibility. Three scenarios were investigated:

- No compensation
- Pay 2,5 eur/MWh of activated flexibility
- Sharing 50% of savings with clients

Spot scenario

Capex = 3000€

	Flex	Pay nothing	2,5 Eur/MWh	50% savings
Heat	1	✓	X	X
	2	X	X	X
	3	✓	✓	✓
Other	1	✓	✓	X
	2	X	X	X
	3	✓	✓	✓
Water	1	✓	✓	✓
	2	✓	X	X
	3	✓	✓	✓

Capex = 2000€

	Flex	Pay nothing	2,5 Eur/MWh	50% savings
Heat	1	✓	✓	X
	2	X	X	X
	3	✓	✓	✓
Other	1	✓	✓	✓
	2	X	X	X
	3	✓	✓	✓
Water	1	✓	✓	✓
	2	✓	X	X
	3	✓	✓	✓

Figure 17: Profitability of remuneration schemes

The results indicate that demand response BM's are economically feasible for some of the analysed profiles and scenarios.

Gisela (EDP) concluded her presentation by re-iterating that there remain some technical, market and regulatory barriers in Portugal for demand response aggregators. However, from the economics' point of view, the results of BestRES project enable the implementation of these BMs for several clients.

Questions from the Audience:
Q: Are you only focused on larger industrial customers?

A: For the time being yes. We will focus and validate the concept with industrial customers as the provide a larger load and easier access to the markets.

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Demand side flexibilization of small customers in Austria

Maximillian Kloess (Oekostrom AG) introduced the concept of variable tariffs (or time of use tariffs) i.e. tariffs where the power price of the customer depends on the time when the power is consumed during the day.

Smart meters are a necessary requirement to offer this service. The concept is related to the flexibilization of power demand thus incentivizing system-beneficial consumer behaviour by shifting load to reduce demand in peak hours.

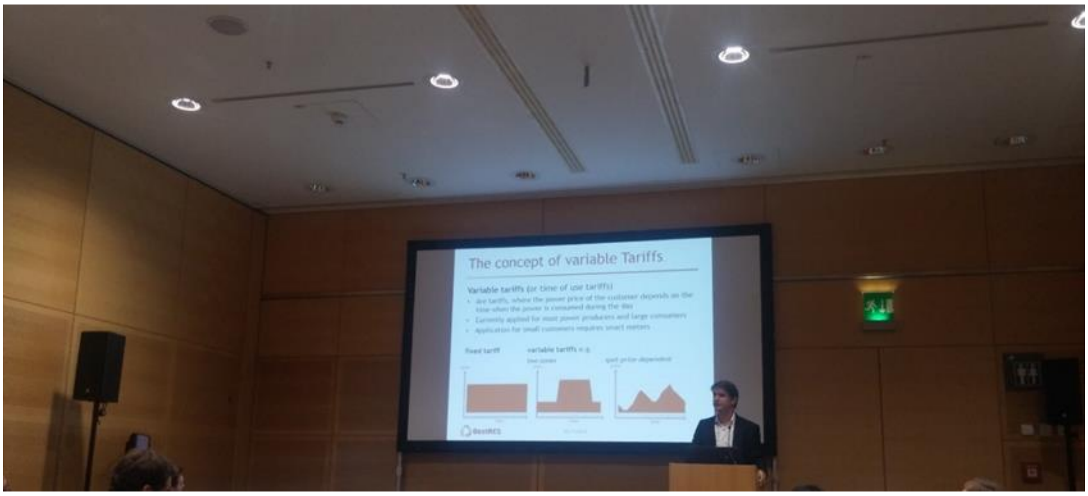

Figure 18: Maximillian Kloess (Oekostrom AG)

Maximillian (Oekostrom AG) presented the results of a customer survey on variable tariffs with a response rate of 1,000 households. Some of the key takeaways were:

- 20% of respondents have a smart meter installed at their primary residence.
- 71% of respondents have not ‘dealt in the past with the topic of time-variable electricity tariffs’.
- 76% of respondents could ‘well imagine the use of a time-variable electricity tariff’.

Oekostrom have developed a time variable tariff to be offered to all customers whom have a smart meter available. The tariff design was as follows:

- Monthly basic charge
- Power pricing based on Austrian day-ahead spot prices (www.exaa.at)
- Fixed fee on top of the power price
- Visualization of consumption and power prices in the customer portal.
- Monthly billing of actual consumption at the realized prizes

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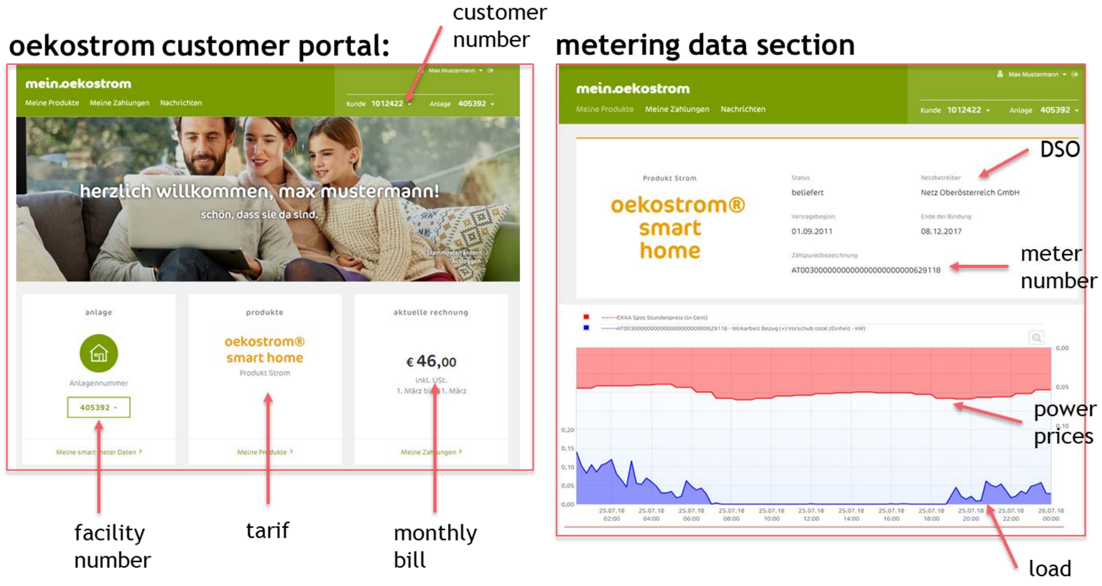

Figure 19: Example of user interface

Maximillian (Oekostrom) outlined the implementation Plan for the pilot project for the time variable tariff:

1. Preparation phase. This involves the setup of infrastructure, adaption of billing systems, data consent from the end user etc.
2. Testing Phase. The testing phase will involve up to 50 customers. The process will test the data exchange with the DSO, the billing process and incorporate customer feedback from the pilot study.
3. Market Introduction i.e. Product launch

Maximillian (Oekostrom) concluded his presentation with the challenges and outlook regarding the identified BM.

The main challenges identified for implementing a time variable tariff scheme include:

- Unexpected changes in the regulatory framework conditions (smart meter roll-out schedule, EU General Data Protection Regulation)
- Slow smart meter roll-out is a major barrier to large scale application
- Data exchange with DSOs still to be established and standardized (metering data; customer declaration of consent for data use)
- Data protection

The outlook and market potential of the variable tariff business model:

- Variable tariffs can lead to cost-savings for customers and suppliers
- Variable tariffs pave the way for further smart services and applications

Session III: Aggregators as enablers of RES producers' participation in the energy market

The third session focused on aggregation business models based on the valorisation of aggregated generation portfolios of RES producers.

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Enabling the marketing of RES producers in Italy

Julian Kretz (Next Kraftwerke Germany) introduced the concept of the Virtual Power Plant.

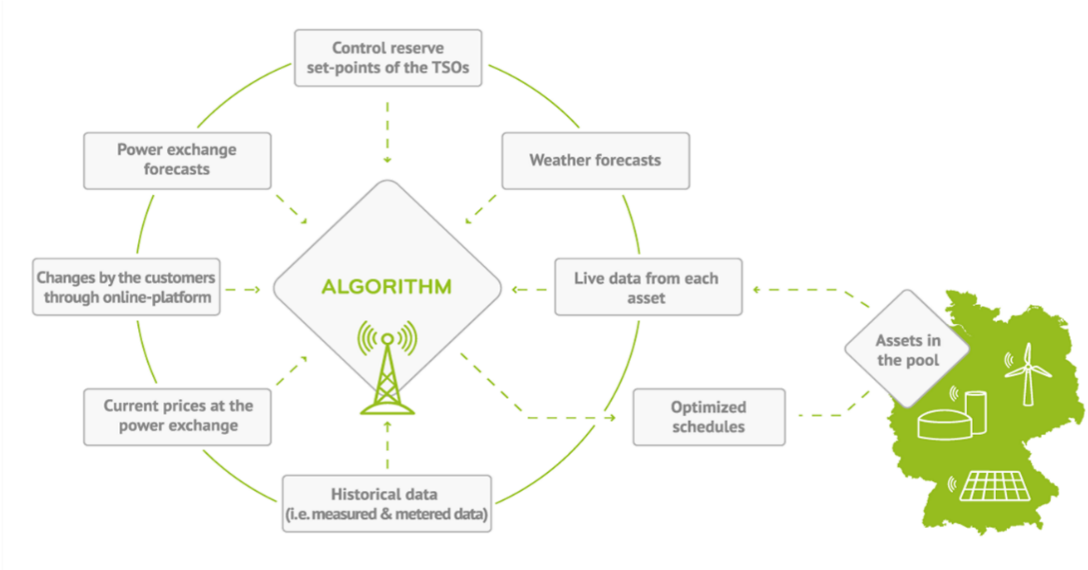

Figure 20: VPP Control System

Julian (Next Kraftwerke Germany) highlighted the benefits of using Next Kraftwerke products for trading RES on the markets:

1. Higher reliability for integrating renewable energies into the power markets, fewer shortfalls within the power system
2. Owner pays a fee for worry-free trading

The benefits of using Next Kraftwerke products for Balancing services were also illustrated:

1. The ‘Next Pool’ stabilizes grid frequency and prevents blackouts
2. The revenue is split between the asset owner and Next Kraftwerke

Juliean (Next Kraftwerke Germany) gave an overview of the Italian market structure as well as the relevant stakeholders and market actors. The Italian market is distinctly different to the German market. The country is split into 6 bidding/ pricing zones.

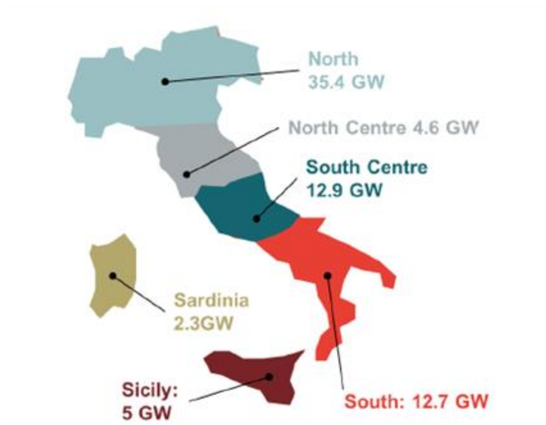

Figure 21: Bidding zones and generation capacity (2014, source:GME)

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Some of the unique characteristics of the Italian electricity market set up include:

- There is no continuous intraday trading, with a central dispatch model.
- The support schemes in the country for renewables incorporate several types of subsidies exist in parallel (FIP, FIT).
- The interaction between balancing and solving congestion takes place within one market.

Julian (Next Kraftwerke Germany) concluded his presentation with an outlook for the company's business case in the Italian Electricity market:

- The business case concerns integrating Renewables via Trading and Balancing services
- Balancing/Dispatch market opening process ongoing
- Challenging market differences compared to markets where Next is already active in
- However new innovative services are possible

Questions from Audience:

Q: When comparing the German and Italian market structure. What would you like to see more?

A: As Germany is our home market, we know it a lot better, therefore we must identify new opportunities in different markets and Italy is an interesting country for our business.

Providing ancillary services with and for more renewables in Belgium

Elias De Keyser (Next Kraftwerke Belgium) introduced his presentation with the need for more flexibility for the energy market highlighting that this can be provide by virtual power plant, which is a 'technology platform that connects distributed energy resources to markets and services which they might otherwise not have access to.

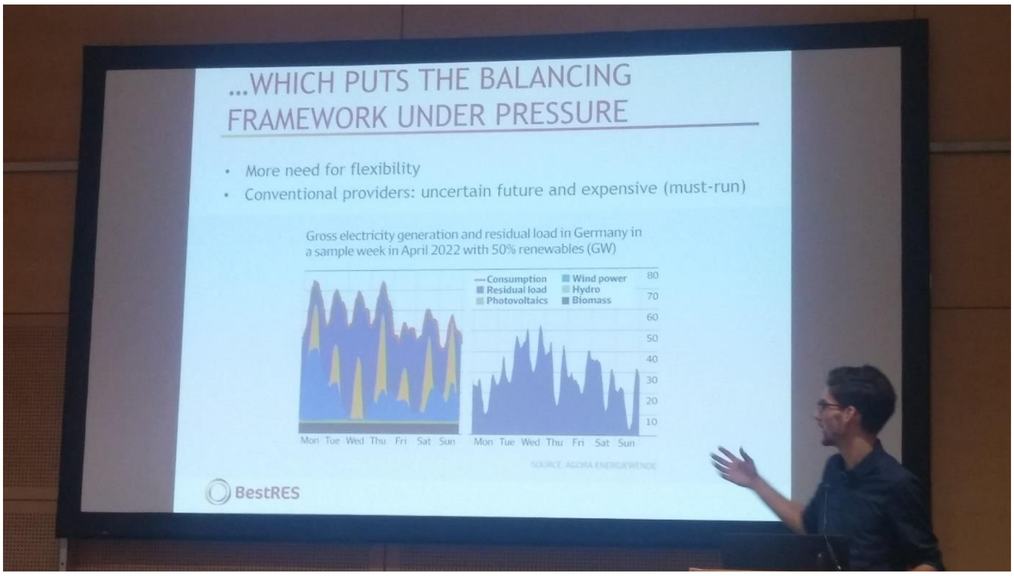

Figure 22: Elias De Keyser (Next Kraftwerke Belgium) emphasising the importance of flexibility

Elias (Next Kraftwerke Belgium) provided the audience with a real-life example under operation today. Next Kraftwerke Belgium operate a 2MWh battery that is connected to a 2MW wind turbine.

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The application of the technology is used to maximise the self-consumption of wind on-site as well as provide Frequency Containment Reserves (FCR) services to the Belgium market and imbalance price steering.

Figure 23: 2MWh battery used to provide FCR services to the Belgium market

Elias (Next Kraftwerke Belgium) outlined the particularities and challenges associated with aggregators acting on the Belgian market:

- Usually long term Purchase Power Agreements (PPA)
- Regional subsidy schemes
- Solar PV mostly small-scale
- Ancillary service markets not fully opened
- Rules are biased towards certain technologies
- Tedious prequalification process

All of these factors influence the involvement and scale of aggregation activities on the markets in Belgium.

Elias (Next Kraftwerke Belgium) ended his presentation by highlighting again that due to increased penetration of renewables we need more flexibility. He concluded with the fact that if decentralised renewable assets are controlled and dispatched properly, they can provide this much needed flexibility.

Questions from the audience:

Q: Does the FCR interfere with the self-consumption rate of the battery?

A: Yes, it does. When offering FCR you must ensure you can deliver, thus a percentage of the battery is allocated to providing FCR services to the market.

Q: How do business models concerning the aggregation of batteries on a household level effect the supplier-aggregator relationship?

A: Business models concerning residential aggregation of batteries are being held back by contracting issues between the balancing responsible parties (BRP), aggregator and supplier. There is the need to figure out a fair way to compensate the supplier for imbalances made to the BRP as a result of aggregation activities at a residential scale.

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Local aggregation services for flexibility to grid operation including congestion management

Venizelos Efthymiou (FOSS) introduced the Cyprus University pilot case study. The case study is a pilot project for BestRES as well as DELTA, GOFLEX, InteGRIDy and PEGASUS.

The university pilot provides a test bed case study. The project aims to investigate the optimal consumption of the system internally and the possibility to offer flexibility to third-parties. Currently the only customer for flexibility in Cyprus is the DSO, thus there is no open market for aggregation services in Cyprus. The case study business model offers to reduce need for infrastructural upgrades and congestion management.

The project used an optimisation function in order to determine the optimum Battery Energy Storage System (BESS) size to minimize electricity costs for the University.

The optimisation function resulted in the installation of a PV installation of 8 MWp and a battery capacity of 2.35 MWh. This results in a payback period of less than 7 years. In this case the BESS has only been considered for supplying PV generated energy to the university microgrid. Other uses of battery, such as tariff arbitraging, ancillary and flexibility services that would increase the BESS's cost-effectiveness are not considered. These ancillary and flexibility services will become profitable for the Cyprus University campus microgrid, when the electricity market will move into a liberalized form.

The operation of the microgrid results in monetary benefits of €1,002,282 for the DSO during the 4 years of development. This is a result of reduced grid losses thanks to the implementation of the BESS and the deferral of grid infrastructural investments.

The below figure illustrates the various stakeholder involved in using demand response using generated flexibilities for congestion management at the DSO level.

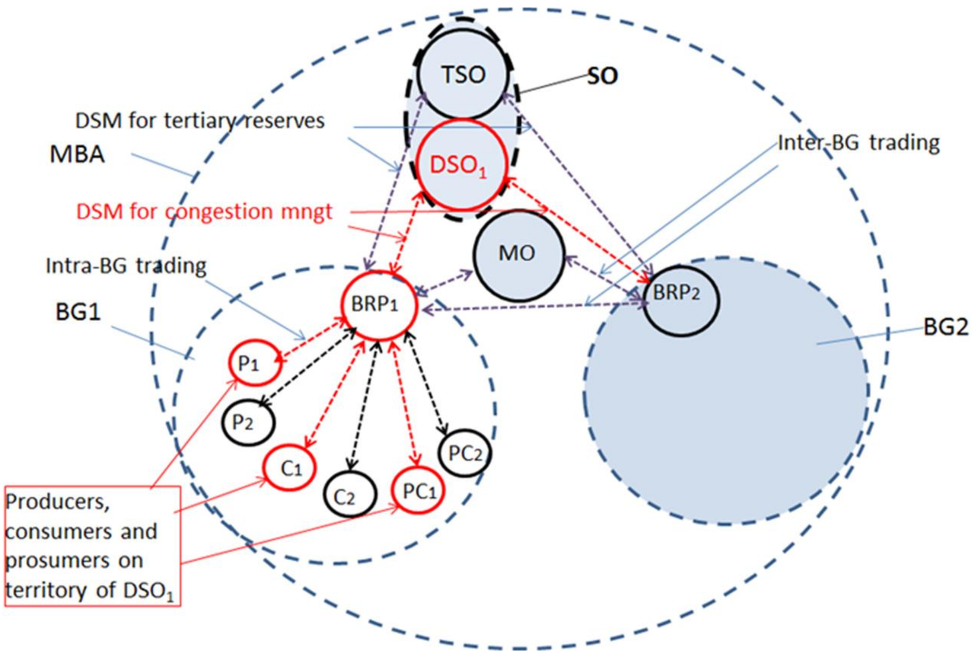

Figure 24: Interactions between the key stakeholders

Venizelos (FOSS) concluded his presentation by providing the participations with the lessons learned:

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- The optimal sizing of the PV - battery storage combination is pivotal in creating business options for medium to large commercial and industrial users.
- The potential for the microgrid / self-control to act as an alternative DSO option to grid investment but also managing operational congestion with the identified possible benefits through the generated flexibilities can form the business opportunity for aggregators in Cyprus.

Questions from the audience

Q: Have you decided on the perfect storage technology?

A: As this is our first stage case study, we are taking a proven technology - lithium-ion battery, for ancillary services and maximized self-consumption.

Session IV: Legal & Policy Overview

The final session focused on the legal frameworks in place and regulatory barriers to the adoption of aggregation business models in the European Union and individual member states.

Recommendation for the further uptake of business models for aggregation

Maximilian Wimmer (SUER) provided the audience of an analysis of the Clean Energy for All Europeans Package from the point of view of aggregators and aggregation services.

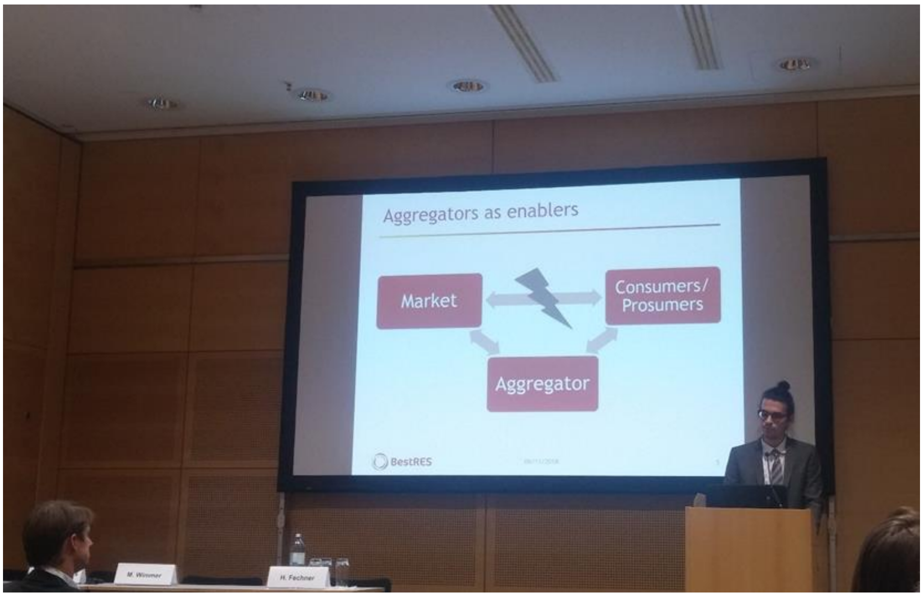

Figure 25: Maximillian Wimmer (SUER) on ‘aggregators as enablers’

It was outlined that the informal trialogue concerning the Internal Energy Market Regulation & Directive will be finalised in December 2018.

Maximillian (SUER) highlighted the key articles in the Clean Energy Package that concern aggregators or aggregation services:

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- Art. 1 IEM-Reg.: this Regulation aims at setting fundamental principles for well-functioning, integrated electricity markets, which […] facilitate aggregation of distributed demand and supply […]

- Art. 2 No. 14 IEM-Dir.: Aggregator means a market participant that combines multiple customer loads or generated electricity for sale, for purchase or auction in any organised energy market.

- Art. 2 No. 15 IEM-Dir.: Independent aggregator means an aggregator that is not affiliated to a supplier or any other market participant.

The proposed legislation concerning market access and participation of aggregators to markets was also highlighted:

- General market principles, Art. 3 IEM-Reg.
  Market participation of consumers and small businesses shall be enabled by aggregation […]

- Access to balancing markets, Art. 5 IEM-Reg.

- Commission/Parliament: all market participants shall have (full) access to the balancing market, be it individually or through aggregation.

- Council: balancing markets, including prequalification processes, shall be organised in such a way as to: […] ensure access to all prequalified market participants, be it individual or through aggregation

Maximillian (SUER) provided the audience with the updates of developments regarding data and privacy protection and data access in relation to the activities of aggregators.

Two favourable positions in respect of data protection and access, Art. 17 & 23 IEM-Dir, were explained:

- Protection of customers' personal data
  set a framework that contains non-discriminatory and transparent rules and procedures for data exchange between market participants engaged in aggregation […] that ensure easy access to data on equal and non-discriminatory terms while fully protecting commercial data and customers´ personal data.

- Aggregators as eligible parties
  Commission and Parliament: […] authorities shall specify the eligible parties which may have access to data of the final customer with their explicit consent (…) Eligible parties shall include at least […] aggregators […]

Maximillian (SUER) then stressed the importance of regulations at the national level. The interlinked nature of European legislation, National legislation and finally barriers for aggregators is illustrated in the following figure.

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Figure 26: Relation between EU and National legislation

In the next stage of the project, SUER will concentrate on the National legislation within the various project partners countries.

Maximilian (SUER) concluded his talk with the following remarks regarding the legislative developments surrounding aggregators access to markets:
- Aggregators are very important enablers for the consumers'/prosumers' access to the market.
- Non-discriminatory market access and participation for aggregators is an important topic in the "Clean Energy" Package.
- The legislative acts regarding renewable self-consumers and energy communities are already finalised. They are likely to facilitate self-consumption and therefore are a positive aspect for aggregators in the future.
- Access to and exchange of data is crucial; as is a high level of protection of customers' data.
- Besides the EU legislation, the national level has to be considered as well.

Questions from the Audience:

Q: What is your point of view about data from the supplier collected through unique products or machines? Will the EU cover it?

A: From the point of view of GDPR it only concerns individual consumers data.

Experience outside of the BestRES consortium: a system perspective from the Netherlands

Ioannis Lampropoulos (Utrecht University) provided an overview of the market situation and developments from a legal and policy perspective towards aggregation in the Netherlands. He adapted the methodology of the BestRES project and applied it to the Dutch market.

The project goals are to:
1. Identify opportunities, barriers and potential solutions for enabling flexibility through aggregators in the Netherlands
2. Identify actions for the Dutch TSO and/ or the regulator might take to promote the proposed solutions (recommendations).

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Ioannis (Utrecht University) gave an overview of ancillary services that are currently traded in the Netherlands

The associated barriers were categorized into four levels as shown in the next figure.

Main categories of barriers	Types of barriers	Elements of barriers
Market	Design barriers	e.g. Length of lead time for automatic FRR
	Entry thresholds	e.g. Min. bid size for FRR
	Lack of transparency	e.g. Non-visibility of mFRRda in the FRR merit order
	Process related barriers	e.g. Requirement for symmetric bids for aFRR
Regulatory	Lack of standards	e.g. Determination of transfer of energy for mFRRda
	Market imperfections and distortions	e.g. Activation characteristics for mFFRda
Technical	Metering and data exchange barriers	e.g. Requirements for aFRR
	Data access barriers	e.g. Delay in smart meter data accessibility
Social	Lack of consumer acceptance	e.g. Low acceptance of smart meters systems

Figure 27: Barriers identified in the Dutch electricty system

The priorities for overcoming the barriers were determined through interviews with experts and relevant stakeholders in terms of system impact and ease of implementation. Two urgent barriers that were identified were:

1. Regulatory – There exists a lack of standards regarding the determination of transfer of energy for manual Frequency Restoration Reserve directly activated (mFRRda). There currently exists no standard for settling of energy imbalances between the customers (or their aggregator) and their suppliers
2. Market – Lack of transparency: Non-visibility of mFRRda in the Frequency Restoration Reserve (FRR) merit order list

In conclusion, it was highlighted that market, regulatory, technical and social barriers do exist to varying degrees. There is a need for new rules, as an enabling policy, and to remove regulator obstacles. Furthermore, policy adaptations are required for the provision of operating reserves, i.e. ensuring that energy imbalance volumes can be established beyond doubt is crucial. Finally, as highlighted in other presentations and business models, smart meter data must be easily accessible to support the business models of aggregators.

Wrap up & Conclusion

Silvia Caneva (WIP) thanked all the presenters for their interesting presentations and the audience for their valuable input, and a special thank you to Mr. Hubert Fechner for moderating the event.

Silvia Caneva (WIP) closed the workshop at 18h00 informing the participants that the minutes and presentation will be available soon on the respective project´s websites: www.bestres.eu.

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Annex - Agenda of the Workshop

Moderator: Hubert Fechner, IEA PVPS, Vice-Chair Strategy and ExCo Austria		
13:00 – 14:00	**Welcome lunch & Registration**	
Session I: Introduction		
14:00	Overview of the BestRES project	Silvia Caneva, WIP
14:10	The BestRES methodology	Daniel Schwabeneder, TUW-EEG & Simon De Clercq, 3E
Session II: Aggregators as enablers of consumers participations in the energy market		
14:40	Households energy management in the United Kingdom	Danelle Veldsman, Good Energy
15:00	Demand side flexibilization of small customers in Austria	Maximilian Kloess, Oekostrom
15:20	Activation and marketing of B2B customers' flexibility in Portugal	Gisela Mendes, EDP
15:40 - 16:00	**Coffee break**	
Session III: Aggregation as enablers of RES producers' participation in the energy market		
16:00	Enabling the marketing of RES producers in Italy	Julian Kretz, Next Kraftwerke Germany
16:20	Providing ancillary services with and for more renewables in Belgium	Elias De Keyser, Next Kraftwerke Belgium
16:40	Local aggregation services for providing flexibility to grid operation including congestion management	Venizelos Efthymiou, FOSS
Session IV: Legal & Policy overview		
17:00	Recommendations for the further uptake of business models for aggregation	Maximillian Wimmer, SUER
17:20	Experience outside the BestRES Consortium: a system perspective from the Netherlands	Ioannis Lampropoulos, Utrecht University
17:40– 18:00	**Wrap-up & conclusion**	

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Technical references

Project Acronym	BestRES
Project Title	Best practices and implementation of innovative business models for Renewable Energy aggregatorS
Project Coordinator	Silvia Caneva WIP – Renewable Energies silvia.caneva@wip-munich.de
Project Duration	1st March 2016 – 28th February 2019

Deliverable No.	D4.6
Dissemination level*	PU
Work Package	WP 4 – Implementation and monitoring of improved business models
Task	T4.6 – European workshop with relevant stakeholders
Lead beneficiary	WIP
Contributing beneficiary/ies	/
Due date of deliverable	28th February 2019
Actual submission date	20th December 2018

* PU = Public

PP = Restricted to other programme participants (including the Commission Services)

RE = Restricted to a group specified by the consortium (including the Commission Services)

CO = Confidential, only for members of the consortium (including the Commission Services)

v	Date	Beneficiary	Author
1.0	29/11/2018	WIP	Cathal Cronin
2.0	03/12/2018	WIP	Silvia Caneva
3.0	12/12/2018	WIP	Silvia Caneva

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