European Workshops on Demand Response 2023

DR4EU
DEMAND RESPONSE FOR EUROPE

Demand Response in Austria

State of play, evolutions and perspectives

Sabine CROME
DG ENER

Paolo BERTOLDI
JRC

European Commission

Benedikt ENNSER
Bundesministerium Klimaschutz, Umwelt, Energie, Mobilität, Innovation und Technologie

Gerald KALT
E-CONTROL
Unsere Energie gehört der Zukunft.

Lukas OBERNOSTERER
APG

Alexander KOFINK
CyberGrid

When?

30th May 2022
13:00 - 13:55 CET
On-line

55 min to be Fit for 55!

How to register?

by e-mail to
info@dr4eu.org

European workshops on DR

from EU framework….

… to national implementation

2021: CEP & Key features

- DR in all markets, incl. day ahead
- Aggregation, independent
- Balancing responsibilities
  - For DR aggregators
  - For impacted suppliers/BRPs
- Provisions for fair competition
- Technicalities: metering data, quality assurance, baseline…

2022: Examples of national rules

- 3 countries
  - Finland
  - Denmark
  - Italy
- First steps
  - Ancillary services to TSOs (BM/mFRR,…)
  - Principles and pilots
  - Legislation yet to come

Now: Current crisis + Energy transition => a radical change: from GWs to daily TWhs

Agenda

- Sabine CROME, DGENER, EC
- Paolo BERTOLDI, JRC
- Benedikt ENNSER
- Gerald KALT
- Lukas OBERNOSTERER
- Alexander KOFINK

- Q&A + questions on-going => in the chat box please

Explicit Demand Response for small end-users and independent aggregators

Status, context, enablers and barriers

Saviuc, I., Zabala López, C., Puskás-Tompos, A.,
Rollert, K., Bertoldi, P.

2022

Background

- The Austrian Climate and Energy Strategy 2030 (#mission2030) was launched in 2018 and contains the structure of Austria's energy and climate policy to 2030

- The goals included in the strategy, among others, are 100% renewable electricity consumption, eliminating electricity import dependency and reaching a share of 46-50% renewable energy in the total primary energy supply

- In order for this target to be reached, #mission2030 includes 12 flagship projects such as (importants):
  - Renewable Heat
  - 100 000 Roof-Mounted Photovoltaics and Small-Scale Storage Programme
  - Green Finance
  - Energy Research Initiative I: Building Blocks of the Energy System of the Future and Energy
  - Research Initiative II: Mission Innovation

Background

- According to the Austrian NECP, the grid reserve is planned to be included in the Electricity Industry and Organization Act. Industrial plants and smaller renewable generation units can be integrated when grid reserve is reduced to 250-500 kW
- In 2019, research facilities and experts from 63 Austrian companies created “Mission Innovation Austria”, a plan regarding the implementation of energy research initiatives during 2020-2030
- Briefly, the plan contains three missions for developing essential components of the future energy systems, identifies 14 innovation targets for completing these missions, which are mostly on energy efficiency and flexibility, and describes 39 specific development plans
- The current government programme sets out a 1-million-roofs-photovoltaic programme based on the Renewable Energy Expansion Act
- On 1 February 2021, APG, together with TSOs from neighbouring countries Swissgrid (Switzerland), Terna (Italy) and TenneT (Germany and the Netherlands), joined the crowd balancing platform EQUIGY. The purpose of the digital “crowd balancing platform” EQUIGY is to enable small players to participate in grid balancing, as well as to aid new participants to manage the energy transition

Transposition of Article 17 of the EU Directive 2019/944

- Transposition into national law is in preparation
- The consultation on the transposition closed in late 2020 (Republik Österreich Parliament, 2021) and the new package defines a prominent role for energy communities
- According to the analysis of the local industry association Oesterreichs Energie, the new draft proposes a focus on self-consumption in the energy communities, whereas in regards to the flexibility resources at the system level, green hydrogen has been highlighted
- The EAG (Renewable Energy Expansion Act) went into force mid-2021

Demand response and aggregators

- Access for DR aggregators to various electricity markets is already ensured, but there are no mechanisms in place for compensating BRPs for any deviations caused by DR activation
- In Austria, aggregators can act in cooperation with the suppliers of residential consumers and participate in the markets
- Residential customers are enabled (through aggregation) to access the balancing market
- Access to the wholesale market (both day-ahead and intraday) via supplier is based on 15 min measured values
- Aggregators of small end-users could be implemented in the future with the Renewable and Citizens Energy Communities (REC and CEC) introduced recently in Austrian law. These energy communities would be entitled to offer aggregator services, amongst other services
- The new EAG law in force since mid-2021 provides only that REC and CEC are allowed to offer aggregation services

TSO Programmes

- Regarding the balancing market, aFRR (secondary control) and mFRR (tertiary control) are generally open for aggregators, also aggregating residential loads
- In aFRR, the minimum size of the (aggregated) load is 1 MW for the first bid, for the following bids 5 MW
- In mFRR, the minimum size is 1 MW. Aggregators can participate in the market for congestion management at TSO-level with a minimum bid size of 1 MW
- APG was already working on an operational system in order to attract and integrate small customers in various markets
- A flexibility platform was proposed in 2019 as a result of collaborations between the TSO and DSOs

Enablers and Barriers to DR and IA

- According to the Austrian NECP, steps have been planned in order for aggregators to be attracted by the sector:
  - units of grid reserve will be reduced to 250-500 kW, enabling smaller units to be integrated along with industrial plants
  - reduction in bureaucracy and stable conditions for aggregators
  - simplification of tariff structures and more transparency for end consumers, taking into account future dynamic pricing
- According to the “Mission Innovation Austria”, a strengthened DR participation is an indirect consequence of the ambitions for digitalization of the network, which is in turn part of the smart grids’ strategy

Enablers and Barriers to DR and IA

- Hence, as of 2021, Austrian aggregators are mostly interested in industrial consumers because of the small flexibility potential of households and high transaction costs, even if regulators allow the participation of residential loads in the wholesale and balancing markets.
- There are no mechanisms in place for compensating balance responsible parties for any deviations caused by DR activation
- Participation of residential customers in the electricity market is practically limited to very few offers of dynamic tariffs
- The introduction of Citizens Energy Communities and Renewable Energy Communities in the Austrian law will be able to provide aggregation services and support to aggregators of small loads

Enablers and Barriers to DR and IA

- The roll-out of smart meters stands at 27.2% (at the end of 2020) and the commitment is to reach 95% by 2024, meaning that before reaching that target in 2024 end-users encounter this technological constraint towards engaging in explicit DR before 2024

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Demand Response in Austria

A new legal framework in the making

Benedikt Ennser
Vienna, 30th May 2023

State of play

- Current legal framework (pre-CEP) recognizes DR participation in selected electricity market segments
  - Congestion management: provision of redispatch services (cost-based)
  - Network reserve: final customers and aggregators from 1 MW (tendering)
  - Balancing: prequalification requirements, terms & conditions (tendering)
  - Demand reduction: reduction of gas consumption during peak hours (tendering)

Legal basis

ElWOG 2010

SVRG

- DR providers are participating in these market segments (except network reserve)
  - Absence or poor design of legal framework does not appear to prevent market access
  - (Large) generators still dominant across all segments

New Electricity Act coming soon

- *Elektrizitätswirtschaftsgesetz (ElWG)* to replace the current *ElWOG 2010*
- Implementation of Directives 2019/944 (EMD) and 2018/2001 (RED)
- New electricity market design & support scheme require up-to-date legal & regulatory framework
- Additional market actors and activities will be defined: renewables self-consumer (active customer), aggregation, demand response

ElWG: General framework for demand response

- Right to provide demand response, through aggregation or stand-alone
- Procurement of non-frequency ancillary services by TSOs/DSOs
- Common flexibility platform
- To be analysed in network development plans (TSOs + DSOs)

ElWG: General framework for aggregation

- Right to an aggregation contract (Art 13 EMD)
  - Smart metering (15 min) required
  - Information requirement by aggregator
  - Data exchange ⇨ market rules (NRA)
- Non-discriminatory market access (Art 17 EMD)
- Compensation + methodology to be established by NRA (Art 17/4 EMD)
  - Administrative ordinance

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Thank you!

Benedikt Ennser

Head of Department, Energy – Legal Affairs @BMK

E-CONTROL
Unsere Energie gehört der Zukunft.

Demand response in Austria:
Current options and outlook

Gerald Kalt (Electricity Department)

30 May 2023

Outline

Overview of options for utilizing and monetizing demand response in Austria

- Implicit demand response
- Spot markets
- Balancing markets
- TSO congestion management
- DSO system management

Implicit demand response

Various options for "price-based" and "behind-the-meter" demand response

Existing options

- Optimization of **self-consumption** (behind the meter)
- **Dynamic price** products (time-of-use pricing)
  - Currently 4 suppliers offer dynamic products (see https://www.e-control.at/tarifkalkulator#/)
  - Retail prices based on Day-Ahead prices at EPEX Spot
- Self-optimization within an **energy community**

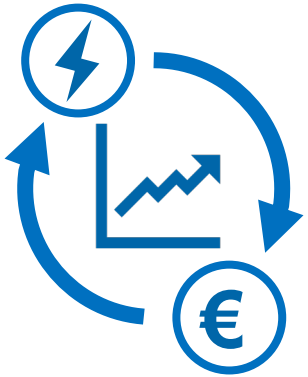
Outlook: Future options

- **Revised tariff system** proposed by E-Control ("Tarife 2.1")
- **Split-supply models** (Art. 4 Dir (EU) 2019/944; 2023-EU-proposal for market design reform)
- Participation in **multiple energy communities**

Spot markets

Monetizing flexibility at Day-Ahead and Intraday markets

Existing options



- **Demand response contracts** with supplier-aggregator / supplier-BRP
  - Monetization of flexibility in short-term markets by supplier-aggregator
  - Utilization of demand response by supplier-BRP to avoid imbalances

Outlook: Future options

- Full implementation of market role „**independent aggregator**“ (Art. 17 Dir (EU) 2019/944)
  - Spot market participation by independent aggregators (i.e. aggregators not affiliated with the customer‘s supplier)

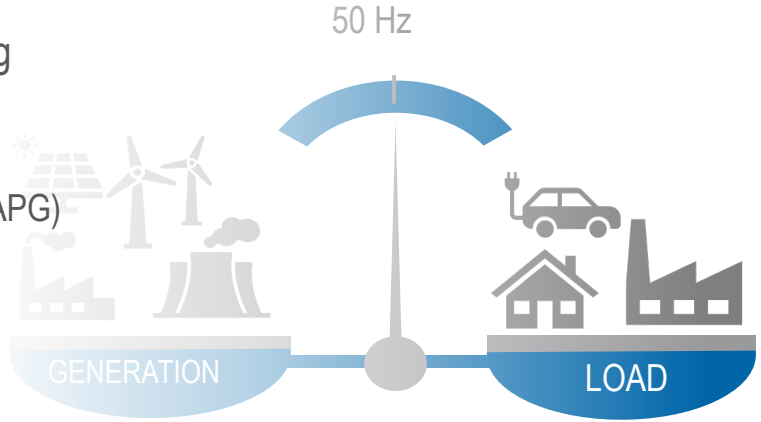
→ **Enhanced opportunities** for DR units to monetize flexibility via spot markets

Balancing

Access for DR to all balancing markets is ensured; formal market rules partly to be developed

Existing options

- Loads (i.e. DR) are generally entitled to participate in balancing markets (FCR, aFRR, mFRR)
  - **Access to all balancing markets** is ensured
  - **Baseline and verification concepts** are agreed upon with TSO (APG)
- Pooling across BRPs* is possible and operational (i.e. independent aggregator model)



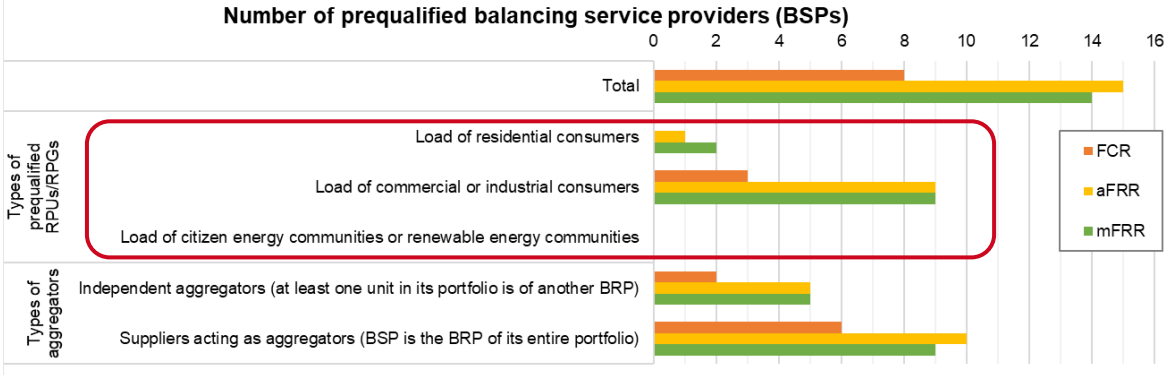
Outlook: Future options

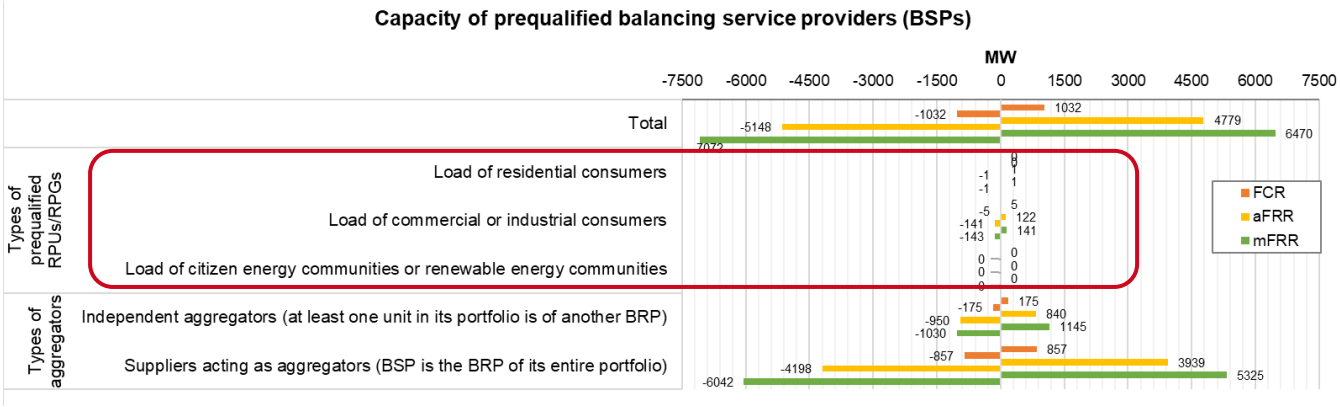
- Full implementation of market actor „**independent aggregator**“ (Art. 17 Dir (EU) 2019/944)
  - Establishment of a **legal basis** and **formal market rules**
  - Implementation shall facilitate **value/revenue-stacking** (i.e. possibility to offer flexibility in multiple markets)

*BRP: Balance Responsible Parties

Demand response in balancing markets in 2022

Loads are represented in pools of most BSPs, but prequalified capacities are comparatively low





Source: data provided by APG (2023)

Congestion management by TSO

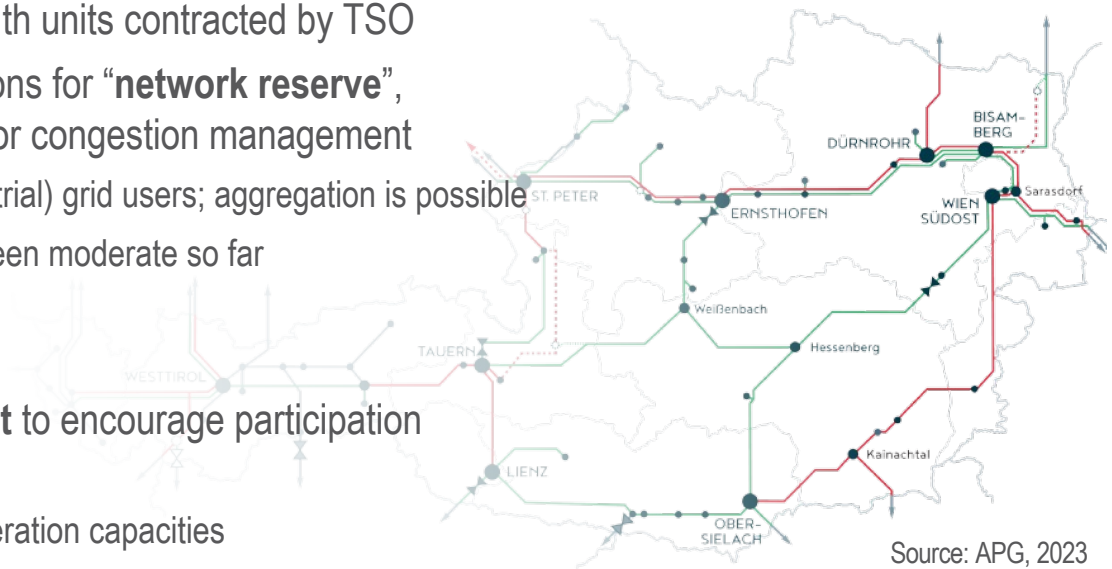
Loads (single or aggregated) may participate in network reserve auctions

Existing options

- **Cost-based redispatch** is performed with units contracted by TSO
- Loads are entitled to participate in auctions for "**network reserve**", i.e. to be part of the reserves available for congestion management
  - Requirements are suited for larger (industrial) grid users; aggregation is possible
  - Interest of DR units in participation has been moderate so far

Outlook: Future options

- Adaptations to **redispatch procurement** to encourage participation of distributed DR resources
  - Substitute for declining dispatchable generation capacities
- Reissue of **peak-shaving product**? (2023-EU-proposal for market design reform)



Source: APG, 2023

System management by DSO

Digitalisation and active system management will create opportunities to monetize demand response

Current situation

- „Interruptible tariffs“ (with fixed off-times)

Outlook: Future options

- DSOs shall consider **flexibility procurement as alternative to grid investments** (Art. 32 Dir (EU) 2019/944)
  - Improved efficiency through flexibility
  - DR units as resources for DSO system management
  - Transparency regarding flexibility requirements through DSO Network Development Plans
- Flexible connection agreements: **Tariffs with variable capacity**
  - Capacity reduction instead of supply interruption
  - Flexible timeslots to facilitate preventive/curative measures by DSO

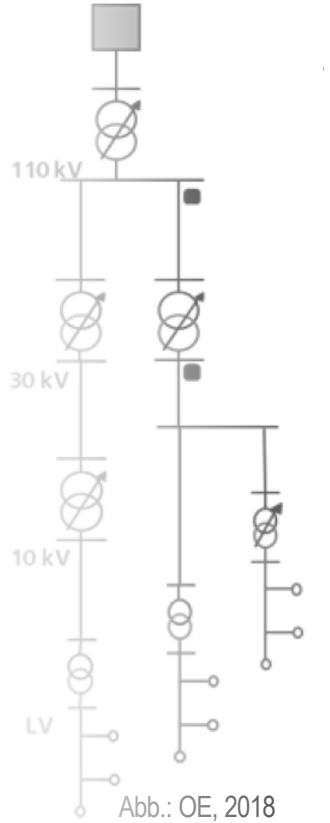


Abb.: OE, 2018

Summary

Cross-cutting & key measures to promote demand response

- Full implementation of the market role „**independent aggregator**“
- **Specifics of demand response** need to be considered in market design
- **Flexibility procurement by DSOs**
- Enable **value/revenue stacking** (necessitates TSO-DSO-coordination & flexibility platform)
- **Interoperability** & standardisation of communication interfaces

Contact

DI DR. GERALD KALT

+43 1 24724 558

gerald.kalt@e-control.at

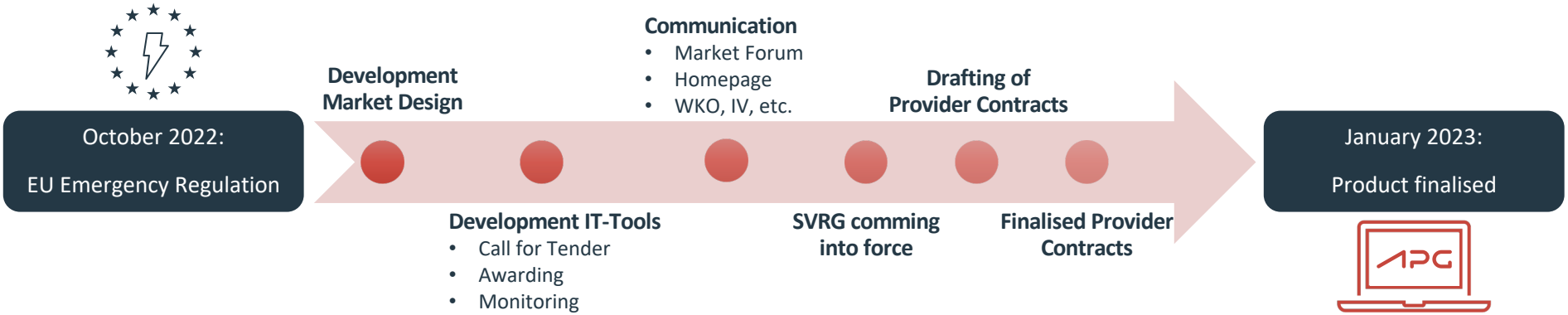
www.e-control.at

Demand Side Response Product

Overview of the Austrian Implementation

30 May 2023

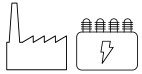
APG Timeline DSR Development



March 2023:

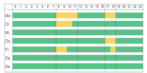
Successful Go-Live

Product Overview



- In weekly tenders, providers (e.g. **industry, aggregators**) offer a **reduction in electricity consumption** in one or more **2-hour time slices** (weekdays 8-10, 10-12 and 17-19).

- The bids are **awarded** according to the **criteria defined in the SVRG**. If the provider is awarded, it must submit its **forecast schedule** to APG **three days prior to delivery**.



- The **activation information** is provided **two days prior to delivery**.

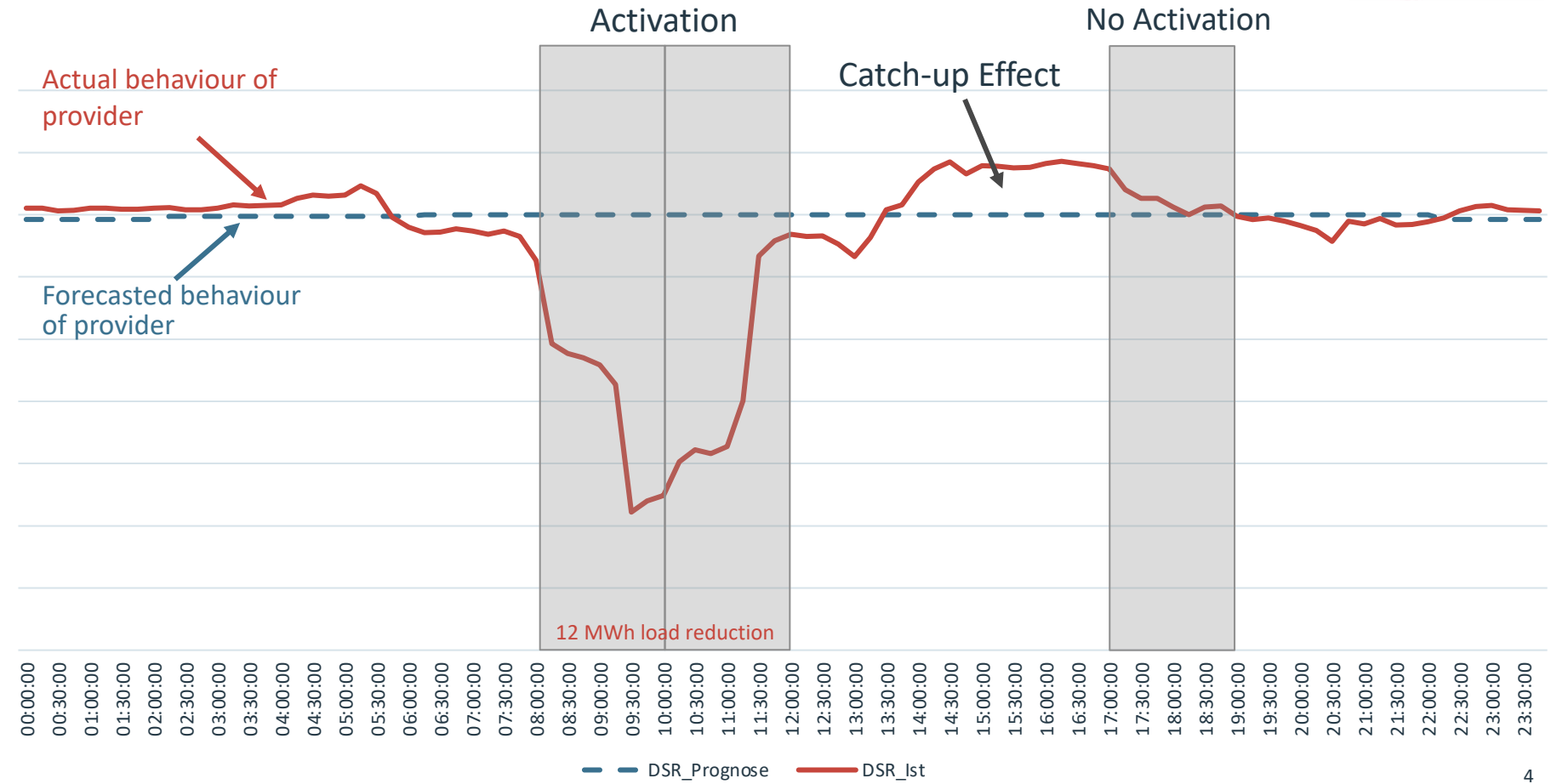
- **Billing and monitoring** are carried out **ex-post** (forecast schedule vs. measurement data at the metering point) minus any **deductions**.

First Insights

- A total of **5 providers** signed framework contracts.

- **Activated volume** amounts to **330 MWh**.

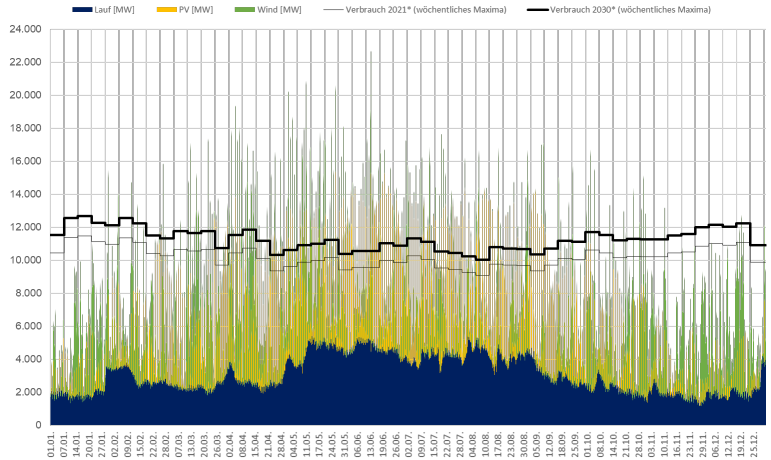
Example of Provider Reaction to Activation



Lessons Learned and Potentials

- **Extremely short development and implementation time** legally and within APG (thanks to extensive experience from similar processes).
- **Three out of five** providers could be newly won for APG
- Products should be developed in **closer coordination with potential providers** (e.g., bidding as close as possible to delivery)
- **Limited experience of providers:** Technical requirements as low-threshold as possible and clear communication required
- **Short timeline extremely ambitious**: Industry needs **longer preparation times** to participate

Load Coverage **2030**

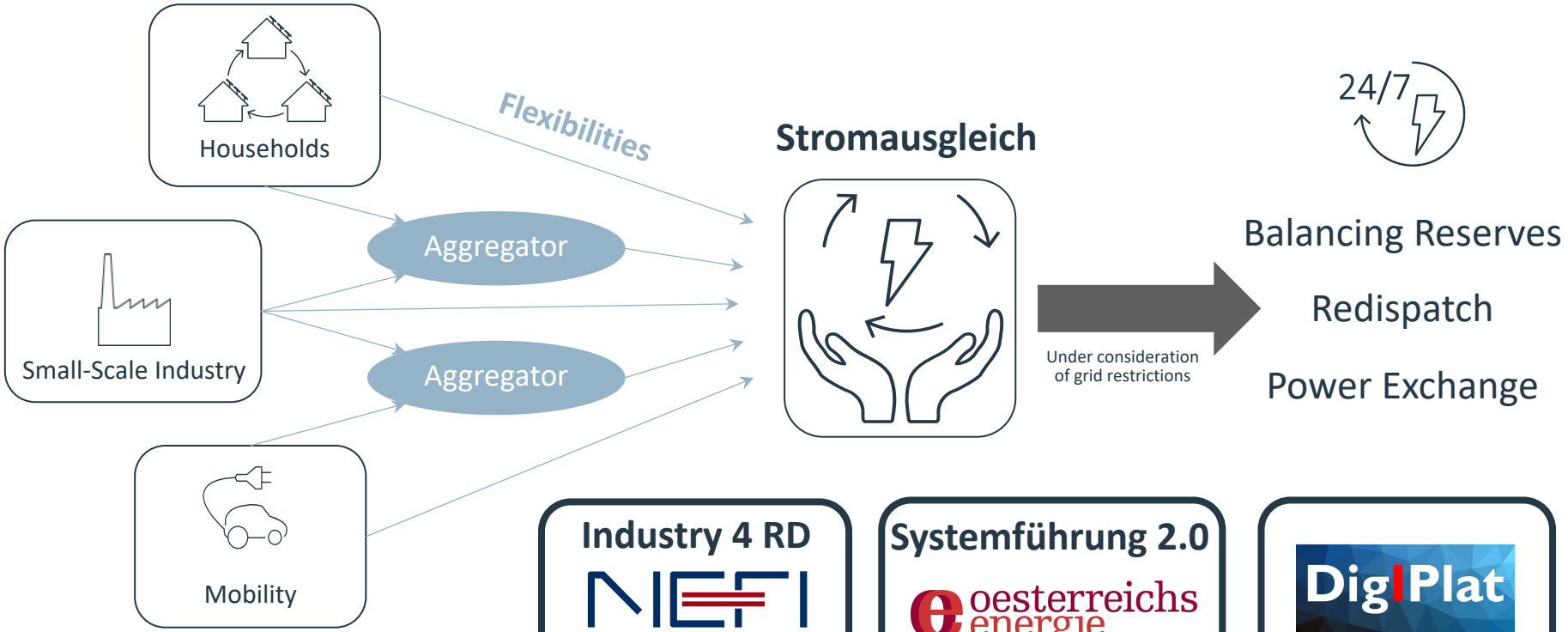


Flexibilisation of demand is a key factor for reaching the climate targets 2030/40

- **Industry** is interested in **providing flexibilisation** measures
- **Incentives** and **technical/organisational requirements** must be designed accordingly
- APG is already working on other projects (e.g., **Stromausgleich Österreich**)

Project Stromausgleich Österreich

Platform for **low-threshold market access** for small-scale flexibility units and flexibility service providers.



Lukas Obernosterer
APG, System Management
Lukas.Obernosterer@apg.at

CyberGrid

Demand Response in Austria
State of play, evolutions and perspectives

Alexander Kofink (CEO)

DR4EU, Webinar, 30th May 2023

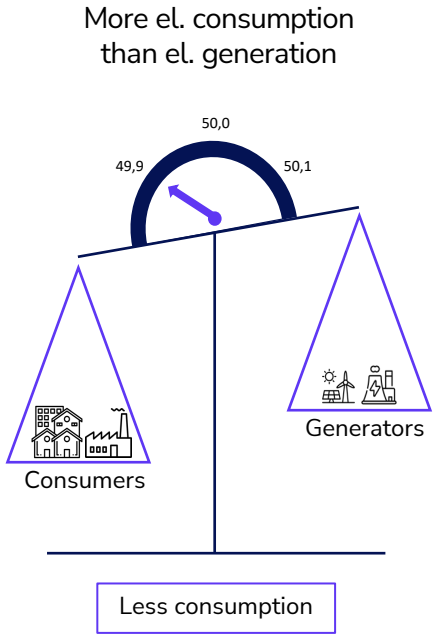
CyberGrid's Mission

CyberGrid strives to unlock and manage distributed power flexibility and make it useful for variety of power system use-cases.

Aggregator's perspective

Advantages of peak shaving product

Why does the new peak shaving product make sense?



1. Purpose is easy to understand by customer
2. Simplicity of product and market
3. Usage of existing market access
4. Operations during day-times
5. No market cannibalisation, if multi-marketing is applied
6. Stengthens the position of demand response in the market development

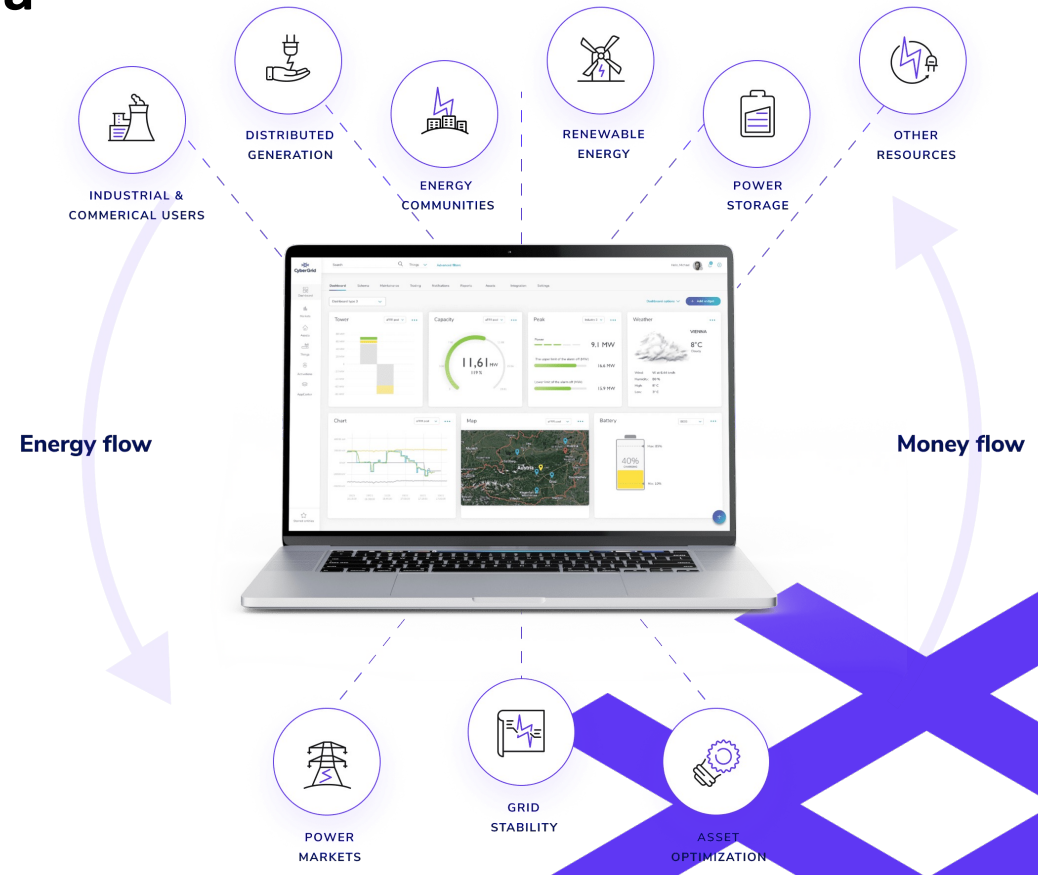
Green the Flex Project (GtF)

Grant Agreement No. 101038856

Unlock flexibility of 3.000 residential customers in Lower Austria

Funded by the European Union
Grant Agreement No. 101038856

- Small Scale Innovation Fund
- Partners: EVN & CyberGrid
- CAPEX 4,5 Mio. €
- Monetization of more than 5 GWh flexibility per year
- Total CO_2 savings: 60.000 t
- Tow use cases:
  - Self-consumption optimization
  - Flexibility market monetization



Contact

Alexander Kofink
CEO

+43 676 810 322 54
alexander.kofink@cyber-grid.com
www.cyber-grid.com

Get in touch

Career opportunities

Project and Interoperability Manager