

Fusebox VPP Use Cases

2024

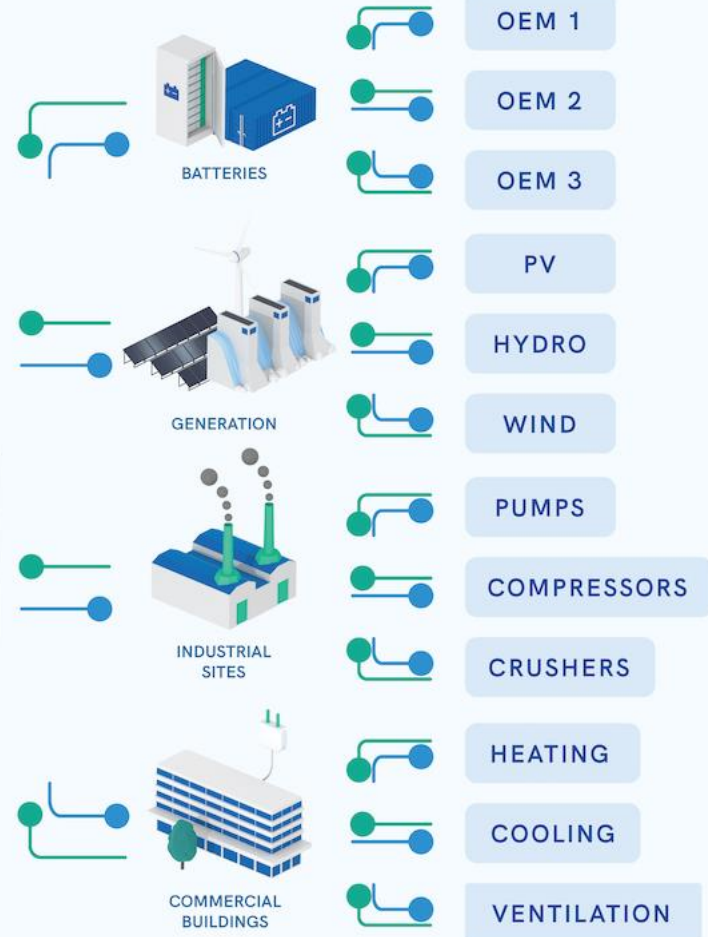
What is a VPP?



TSO &
ENERGY MARKET

TSO DATA
EXCHANGE

BRP
TRADING DESK



Business models

A large, stylized green lightning bolt icon pointing upwards and to the right.

VPP
Model 1

Creating revenue streams through the provision of ancillary services to TSO.

A large, stylized green lightning bolt icon pointing upwards and to the right.

VPP
Model 2

Reducing the imbalance in a power utility's production and consumption portfolio.

A large, stylized blue lightning bolt icon pointing upwards and to the right.

EMS
Model 3

Generating additional income through ancillary services and arbitrage, with revenue sharing for asset owners.

A large, stylized blue lightning bolt icon pointing upwards and to the right.

EMS
Model 4

Minimizing energy costs.

Core Features

Core Features

- **Operational insight**, near real time telemetry
- MQTT & API communication
- Asset control capability
- Battery storage trading engine
- Grid congestion, energy diversion
- Asset optimization based on day-ahead price
- Loads shifting and shedding
- **Full readiness for the participation at Ancillary Services**

Ancillary Services

- **Fast connection** to Fusebox EMS sites
- mFRR up and down trading
- aFRR up and down trading
- FCR up and down trading
- FFR

Business case 1: Ancillary services to TSO

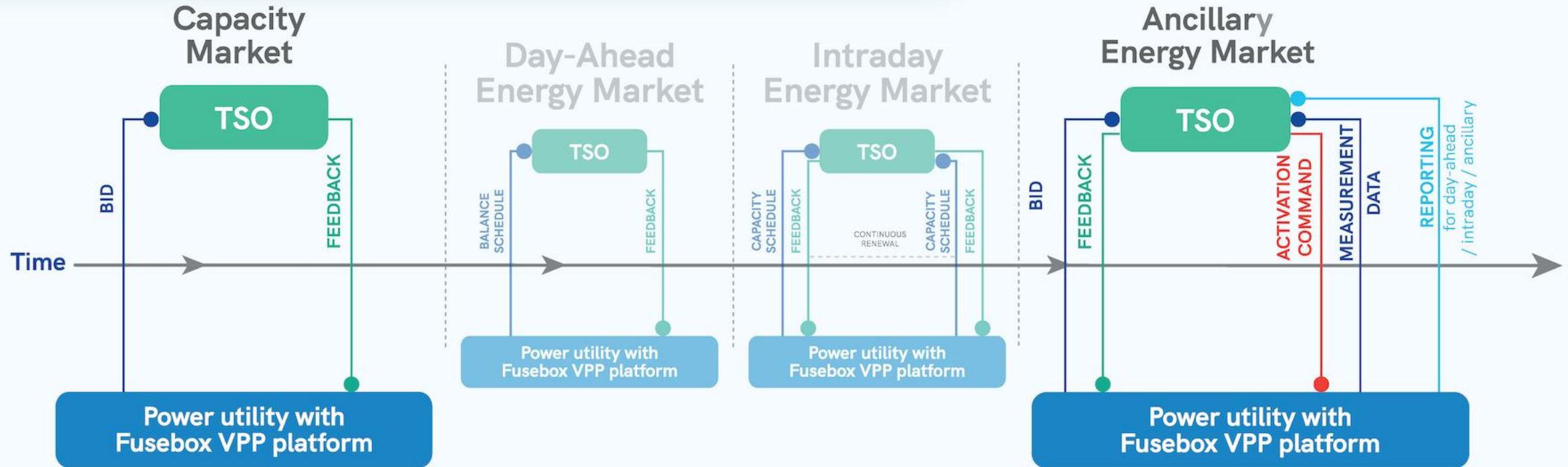


Creating revenue streams through the provision of ancillary services to TSO.

Prerequisites

- **Integration with TSO:**
 - mFRR, aFRR and FCR bidding
 - real-time telemetry capabilities
- **Integration with Assets:**
 - real-time telemetry

Business case 1: Ancillary services to TSO



VPP platform technical capabilities *(fully automated)*

- Price strategy, bidding, market result monitoring, and scheduling
- Dispatch and regulation
- Reporting, settlement, and billing
- Support & training

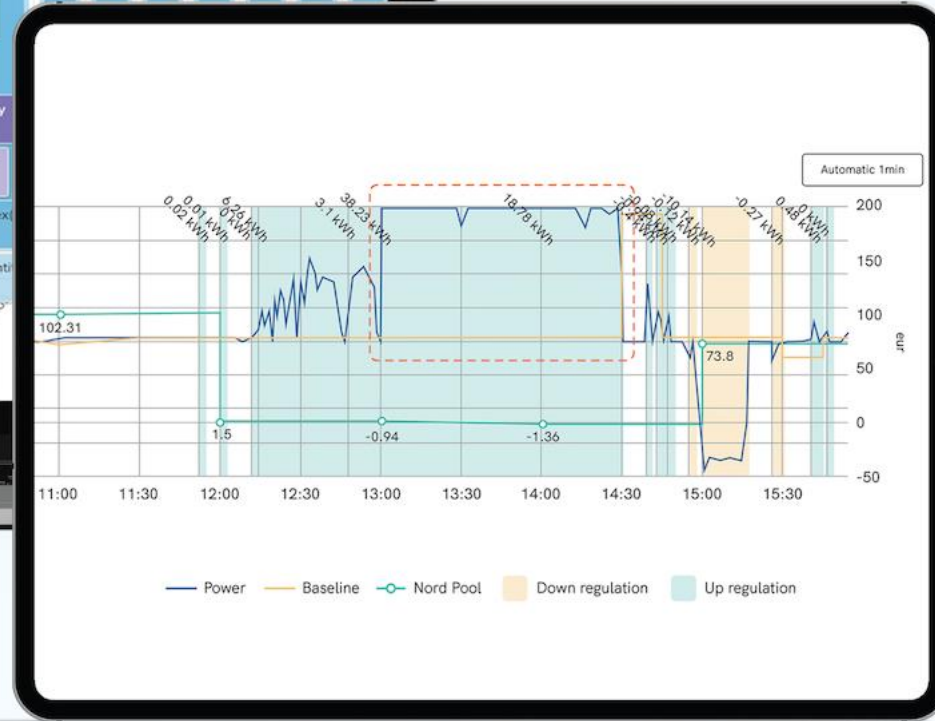
Results

- New revenue stream
- Expanded market options

Business case 1: Ancillary services to TSO

Energy flexibility

2023-09-21
Yesterday | Today | Tomorrow



Business case 2: Imbalance reduction



Reducing the imbalance in a power utility's production and consumption portfolio.

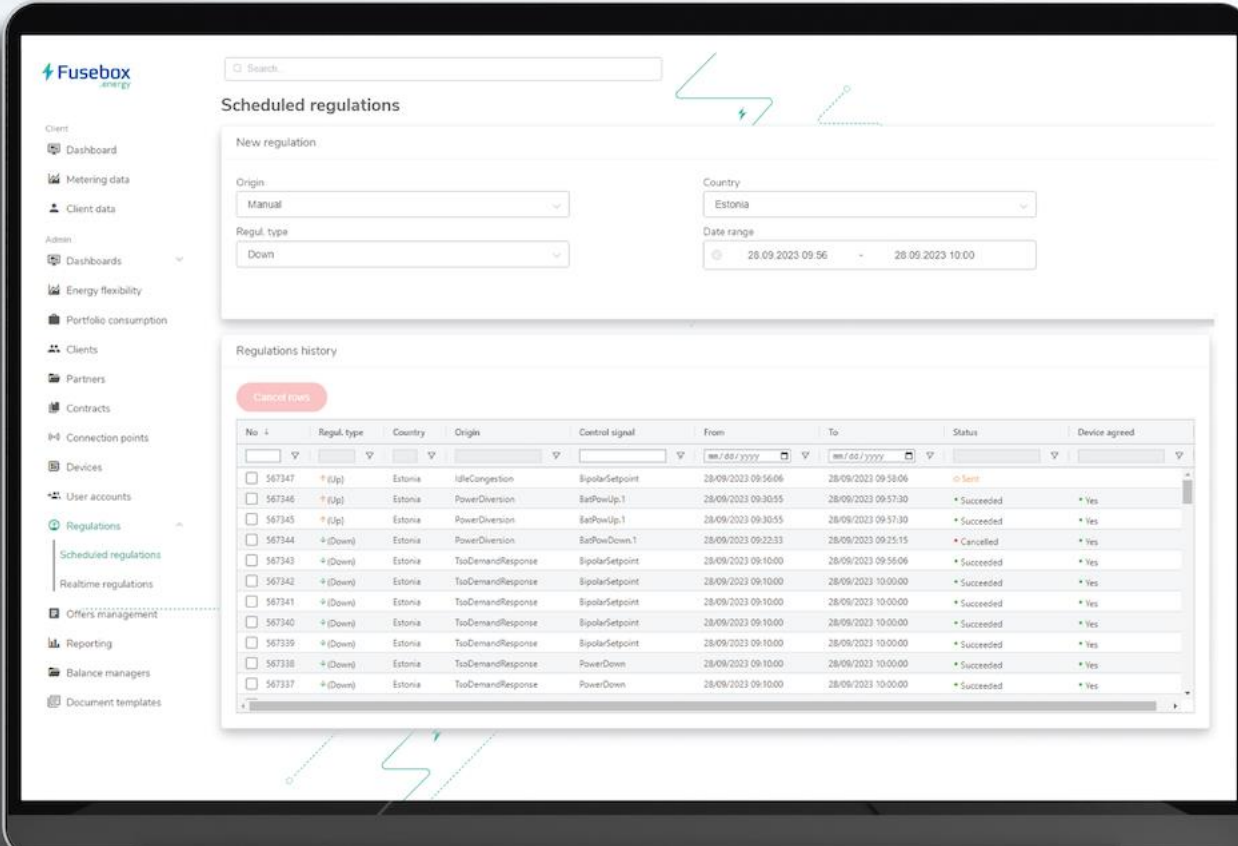
Prerequisites

- **Scalable integration** with monitorable assets
- **Real-time** telemetry of assets

Optional

- **TSO integration** for improved schedule accuracy

Business case 2: Imbalance reduction



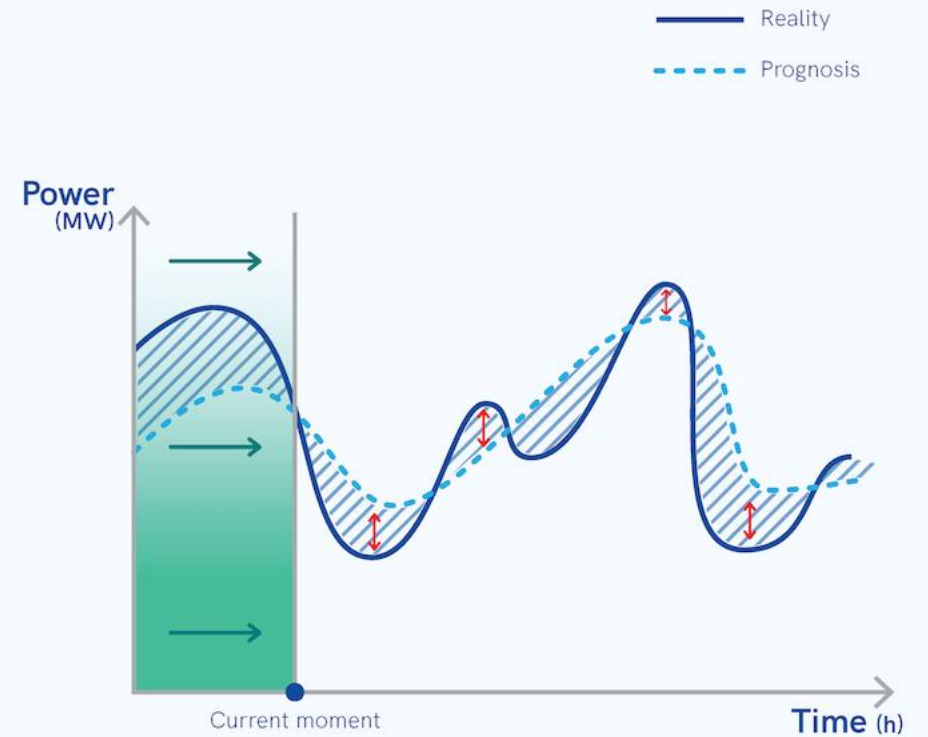
The screenshot displays the Fusebox energy management interface. On the left is a navigation menu with categories like Client, Admin, and Reporting. The main content area is titled 'Scheduled regulations' and includes a 'New regulation' form and a 'Regulations history' table.

New regulation form:

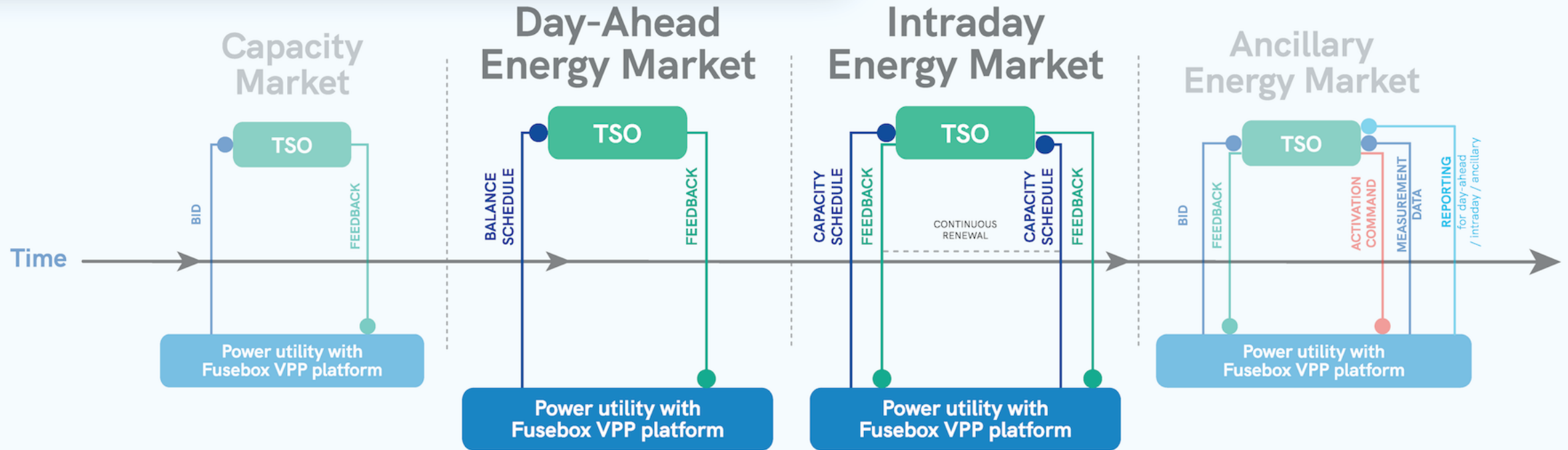
- Origin: Manual
- Country: Estonia
- Regul. type: Down
- Date range: 28.09.2023 09:56 - 28.09.2023 10:00

Regulations history table:

No	Regul. type	Country	Origin	Control signal	From	To	Status	Device agreed
567347	+(Up)	Estonia	IdleCongestion	BipolarSetpoint	28/09/2023 09:56:06	28/09/2023 09:58:06	Start	
567346	+(Up)	Estonia	PowerDiversion	BasPowUp.1	28/09/2023 09:30:55	28/09/2023 09:57:30	Succeeded	Yes
567345	+(Up)	Estonia	PowerDiversion	BasPowUp.1	28/09/2023 09:30:55	28/09/2023 09:57:30	Succeeded	Yes
567344	+(Down)	Estonia	PowerDiversion	BasPowDown.1	28/09/2023 09:22:33	28/09/2023 09:25:15	Cancelled	Yes
567343	+(Down)	Estonia	TsoDemandResponse	BipolarSetpoint	28/09/2023 09:10:00	28/09/2023 09:56:06	Succeeded	Yes
567342	+(Down)	Estonia	TsoDemandResponse	BipolarSetpoint	28/09/2023 09:10:00	28/09/2023 10:00:00	Succeeded	Yes
567341	+(Down)	Estonia	TsoDemandResponse	BipolarSetpoint	28/09/2023 09:10:00	28/09/2023 10:00:00	Succeeded	Yes
567340	+(Down)	Estonia	TsoDemandResponse	BipolarSetpoint	28/09/2023 09:10:00	28/09/2023 10:00:00	Succeeded	Yes
567339	+(Down)	Estonia	TsoDemandResponse	BipolarSetpoint	28/09/2023 09:10:00	28/09/2023 10:00:00	Succeeded	Yes
567338	+(Down)	Estonia	TsoDemandResponse	PowerDown	28/09/2023 09:10:00	28/09/2023 10:00:00	Succeeded	Yes
567337	+(Down)	Estonia	TsoDemandResponse	PowerDown	28/09/2023 09:10:00	28/09/2023 10:00:00	Succeeded	Yes



Business case 2: Imbalance reduction



VPP platform technical capabilities *(fully automated)*

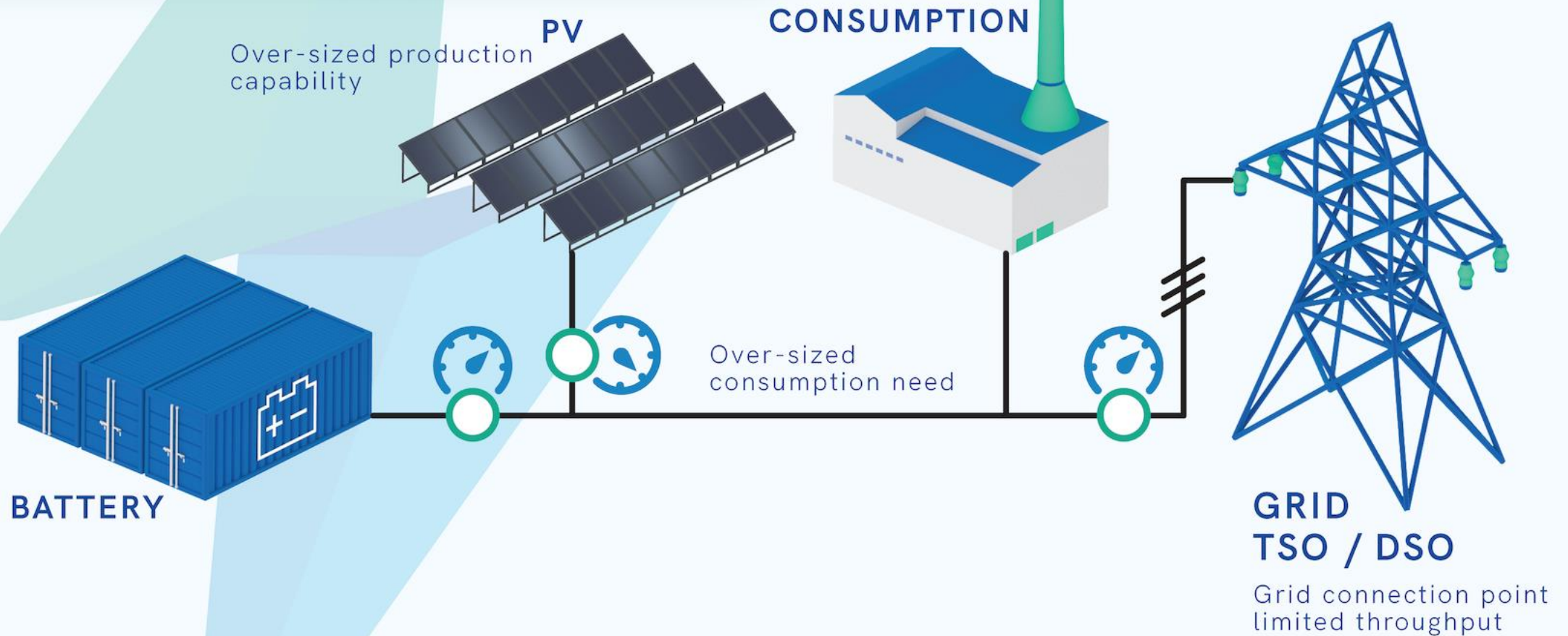
- Situational overview of production and consumption assets that usually contribute to imbalance
- Asset group scheduling and control capability
- Automated data exchange with TSO for sending balancing and capacity reports

Results

- Reduction of imbalance costs
- Continuous overview of portfolio's consumption and production

Business case 3: Energy arbitrage

Behind the meter model



Business case 3: Energy arbitrage



Generating additional income through energy arbitrage, with revenue sharing for asset owners.

Prerequisites

- Energy storage capability
- Real-time telemetry connections with (TSO and) assets

Optional

- Cooperation between renewable and demand-side resources (small & medium-scale assets)
- TSO integration for improved arbitrage via ancillary services for increased price difference

Business case 3: Energy arbitrage

VPP platform technical capabilities *(fully automated)*

- Activate energy arbitrage scheduling based on prices
- Implement reporting and billing
- Consider PV and wind production in operation choices

Results

- Increase revenue
- Maximized earnings by managing energy market volatility and balancing services
- Revenue-sharing with asset owners
- Reduce client churn
- Attract new customers

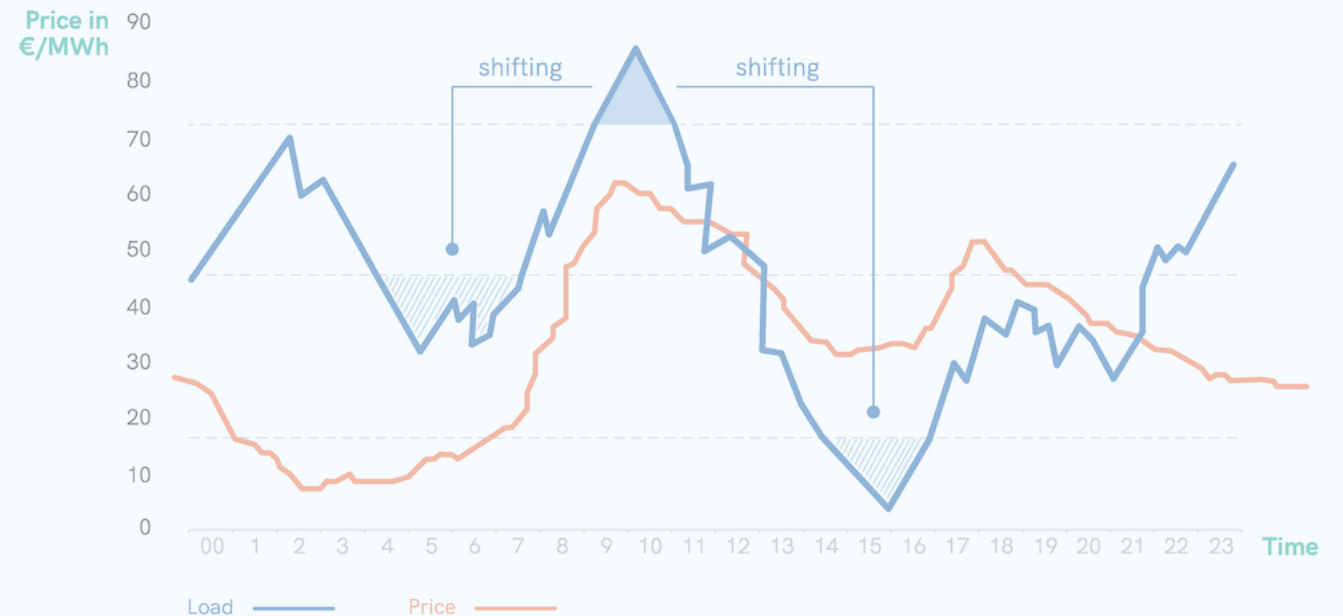
Business case 4: Minimizing Energy costs

VPP platform technical capabilities *(fully automated)*

- Optimization module considers energy prices and technical constraints
- Utilizes energy price data
- Manages power flows and curtailment
- Automates reporting and billing

Results

- Cost savings
- Reducing client churn
- Attracting new customers



Business case 4: Minimizing Energy costs

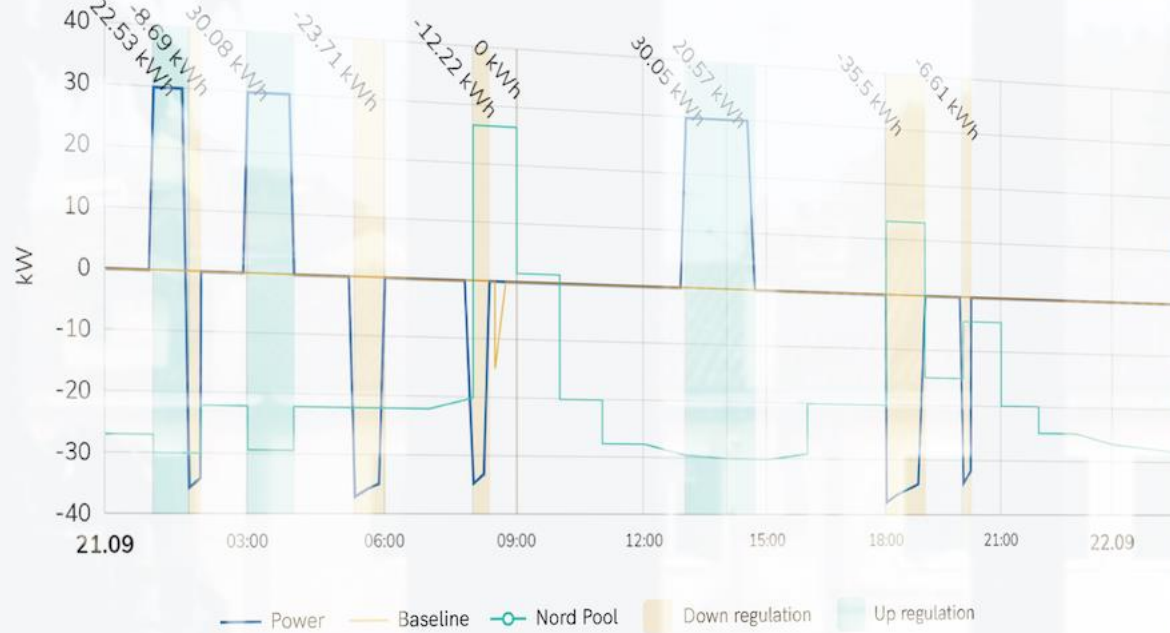


Minimizing energy costs by peak shaving and load shifting (demand response).

Prerequisites

- Utilization of Controllable demand side Assets (Medium and Small-Scale)
- Real-time Telemetry Integration with Assets

Metering data



Business case 4: Minimizing Energy costs

Integration alternatives

Fusebox Industrial and Residential Gateway Controllers

(LAN, 4G, WiFi)

- ⚡ Process controller independent
- ⚡ Communication over secure MQTT protocol
- ⚡ Supports industrial field-buses (e.g ModbusTCP)

Cloud-to-Cloud Building Management System (BMS)

- ⚡ Schneider
- ⚡ Siemens
- ⚡ Fidelix
- ⚡ ARE Cloud
- ⚡ ABB
- ⚡ ... and many others

OEM API integration

- ⚡ Manufacturer specific API
- ⚡ E.g. Huawei, SolarEdge, GoodWe

API aggregator integration

- ⚡ eNode
- ⚡ Telematica
- ⚡ EV Energy
- ⚡ ... and many others

Fusebox



Thank you!

**Interested to know more?
Drop us a line**

Aleksandr Sepp | Head of Strategic Partnership
+372 5344 0574 | aleksandr@fusebox.energy