



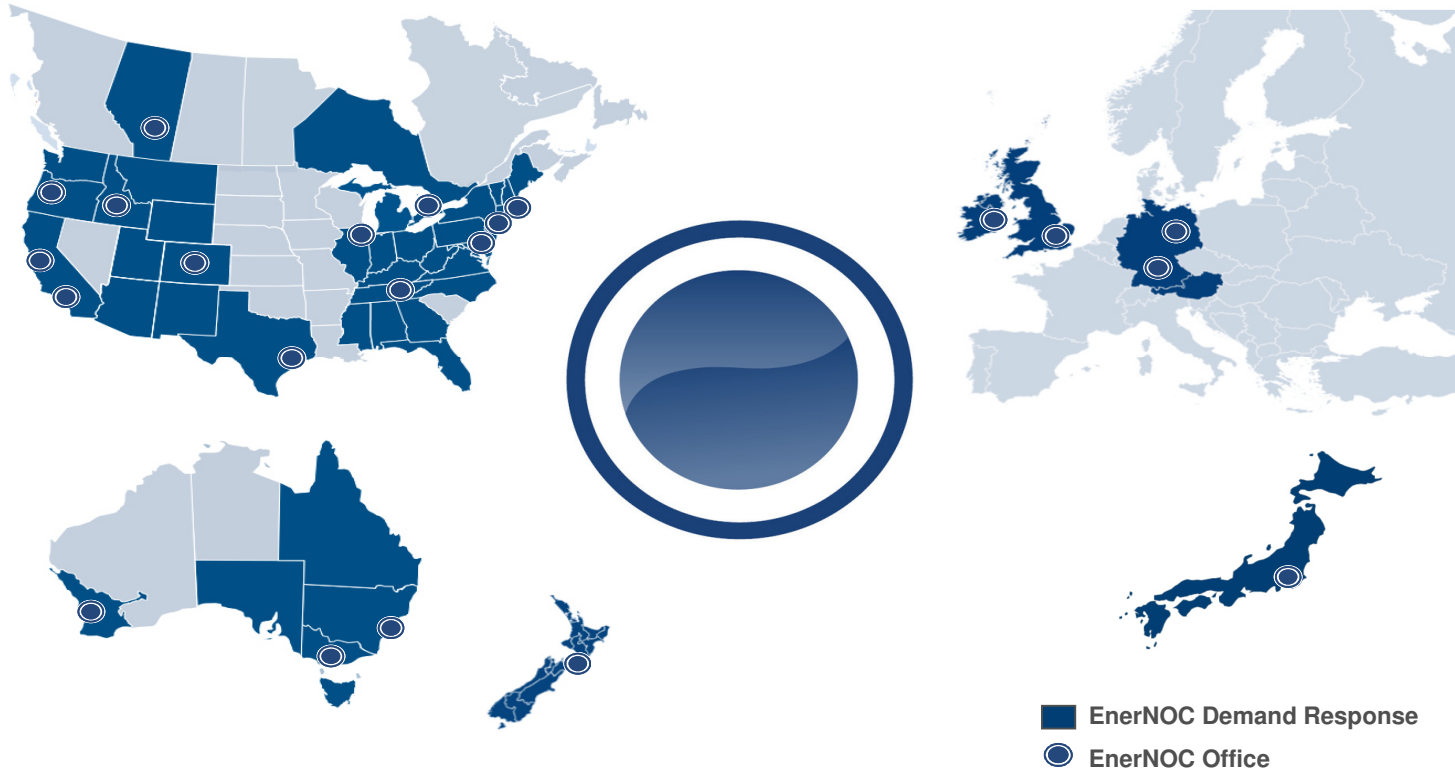
The Demand Response business model and barriers in the German market

BSEC Seminar: Demand Side Response – when to realize what services and how?

Berlin, 10 December 2014

EnerNOC at a Glance

EnerNOC is a leading Demand Response and Energy Intelligence (EIS) software provider



Proven Customer Track Record

- Activities in over 100 nations, with active DR programs in 10 countries
- 24-27 GW of peak load under management across 14,000+ C&I buildings; 30-35% dispatchable DR
- Close to \$1bn in customer payments/savings to date

Full-Value Technology Offering

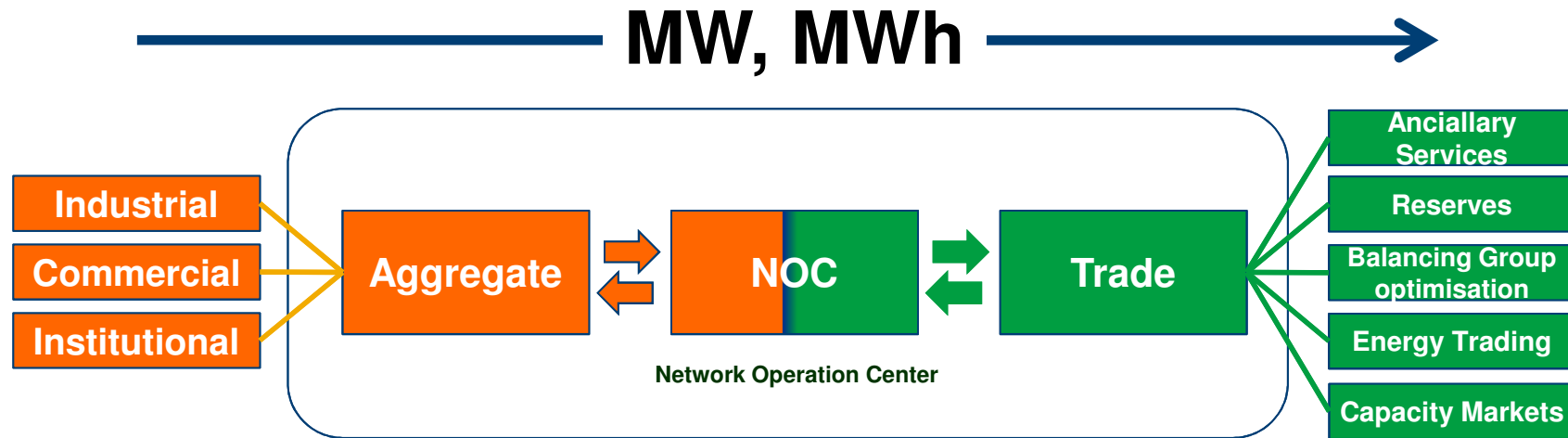
- Energy Intelligence Software (EIS)
- Comprehensive technology, managed services, and market access
- 24/7/365 Network Operations Center and customer support

Growing business across the world

- Over 1,000 employees
- Publicly traded on the U.S. NASDAQ (ENOC)

The Demand Response Business Model

How EnerNOC operates as a DR-aggregator



Consumers / Participants:

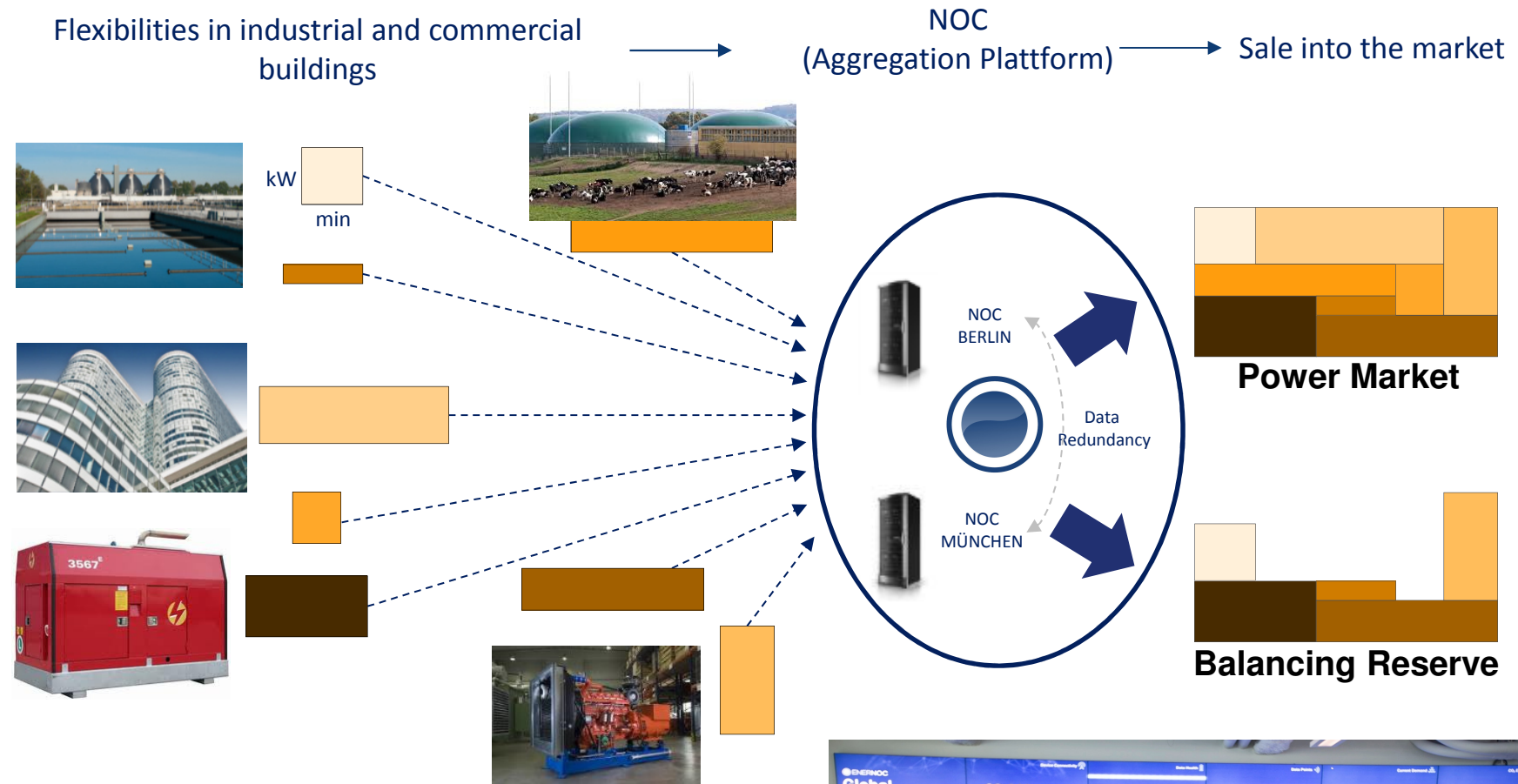
- Factories
- Buildings
- Households
- E-Cars

- Recruiting
- Sign-up
- Provisioning
- Maintenance

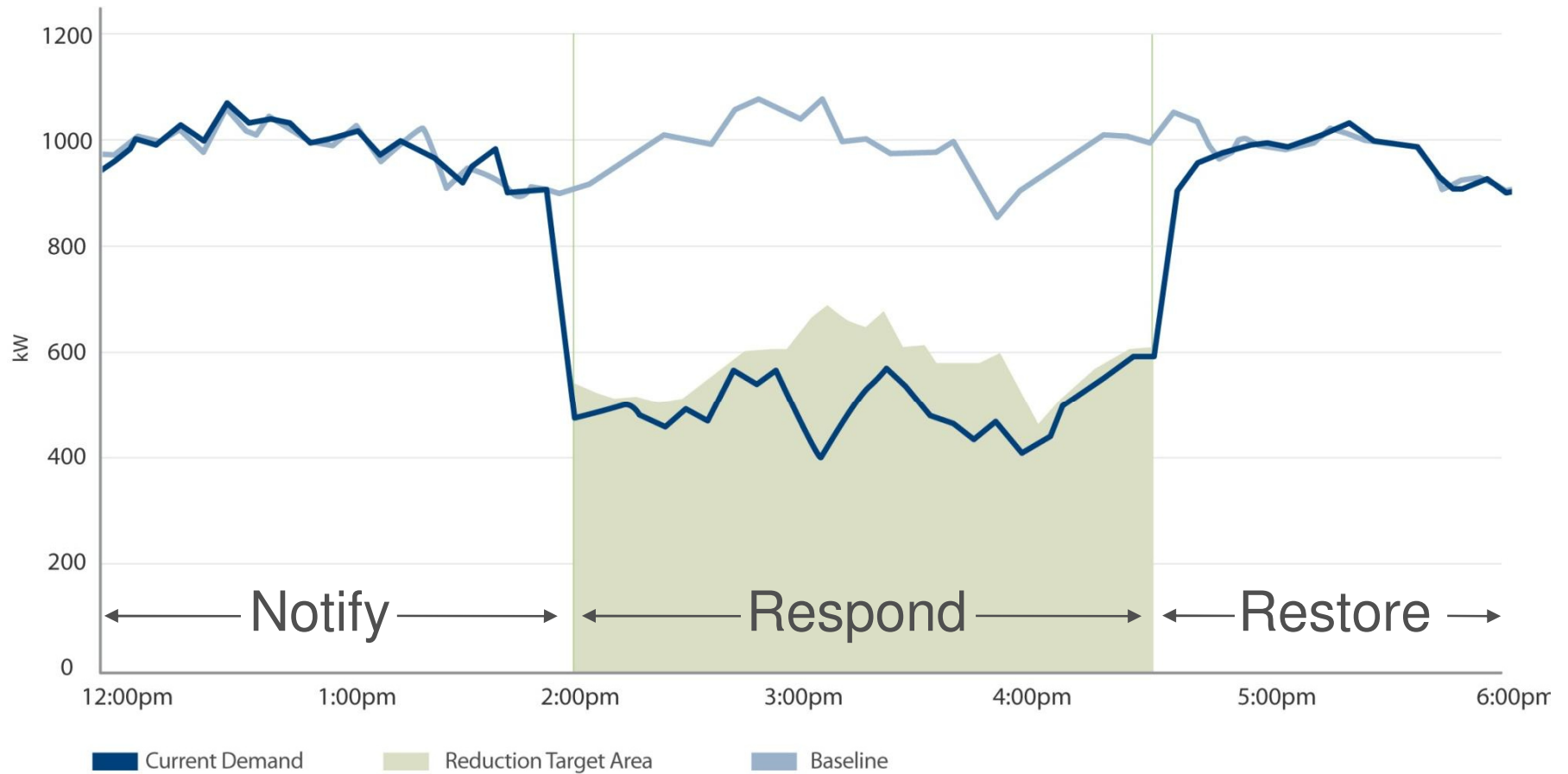
- Forecasting
- Packaging
- Monitoring
- Controlling

- Sales
- Trading
- Reporting
- Balancing Mechanism

The EnerNOC Network Operations Center uses single loads and aggregates them to create products that can be sold

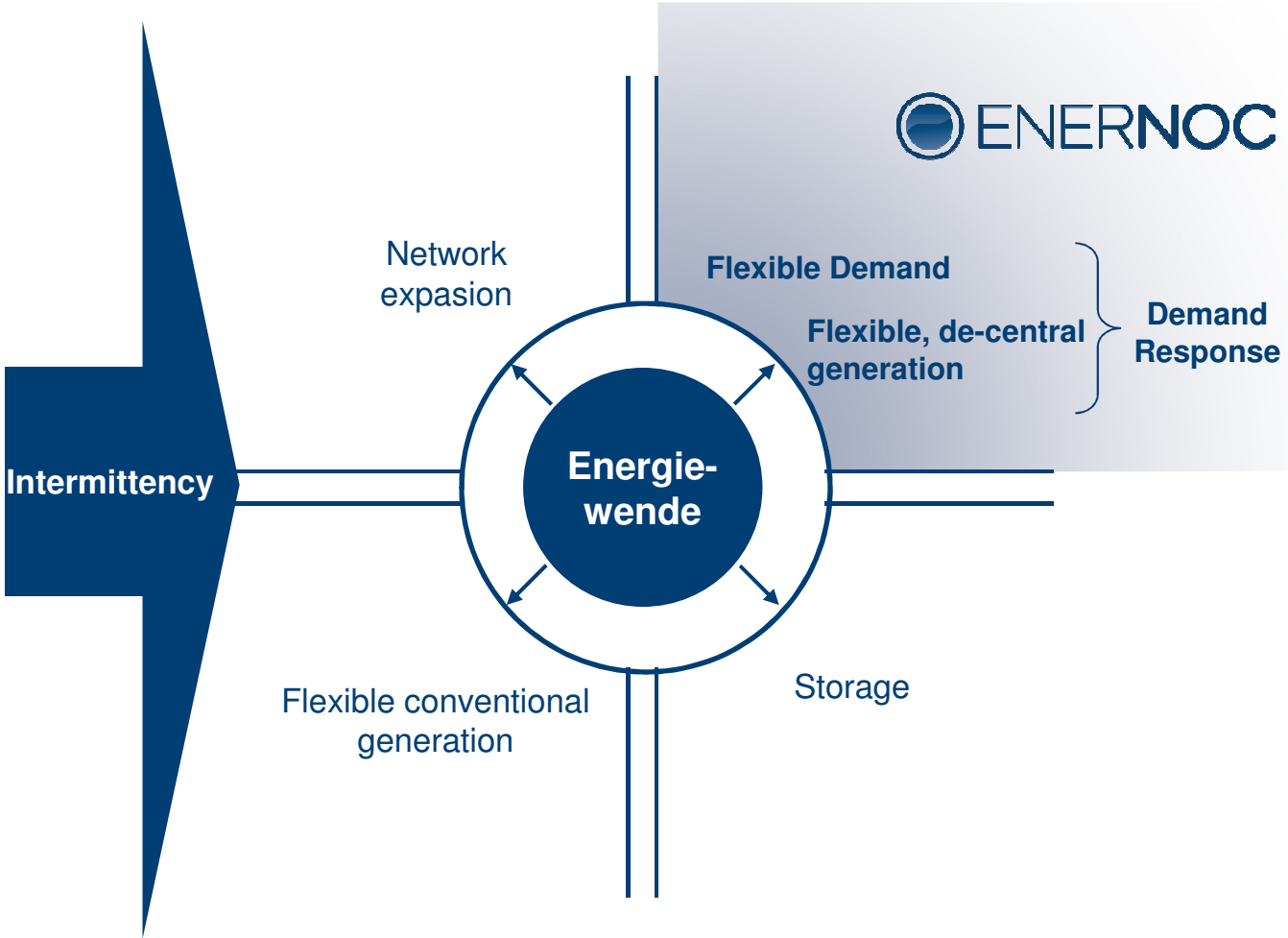


How Demand Response Events Work



Challenge Energiewende: Integration of intermittent renewable power

Demand Response is an important flexibility provider



EnerNOC has unlocked flexibilities in various industries and brought them to market

There are large potentials for DR in Germany

Industries for Demand Response

- Base material / chemical industry
- Processing of raw materials
- Waste water treatment
- Pipelines
- Waste incineration
- Paper, glass, steel, aluminium production
- Food production
- Large buildings
- Data centers
- (...)

Technical assets

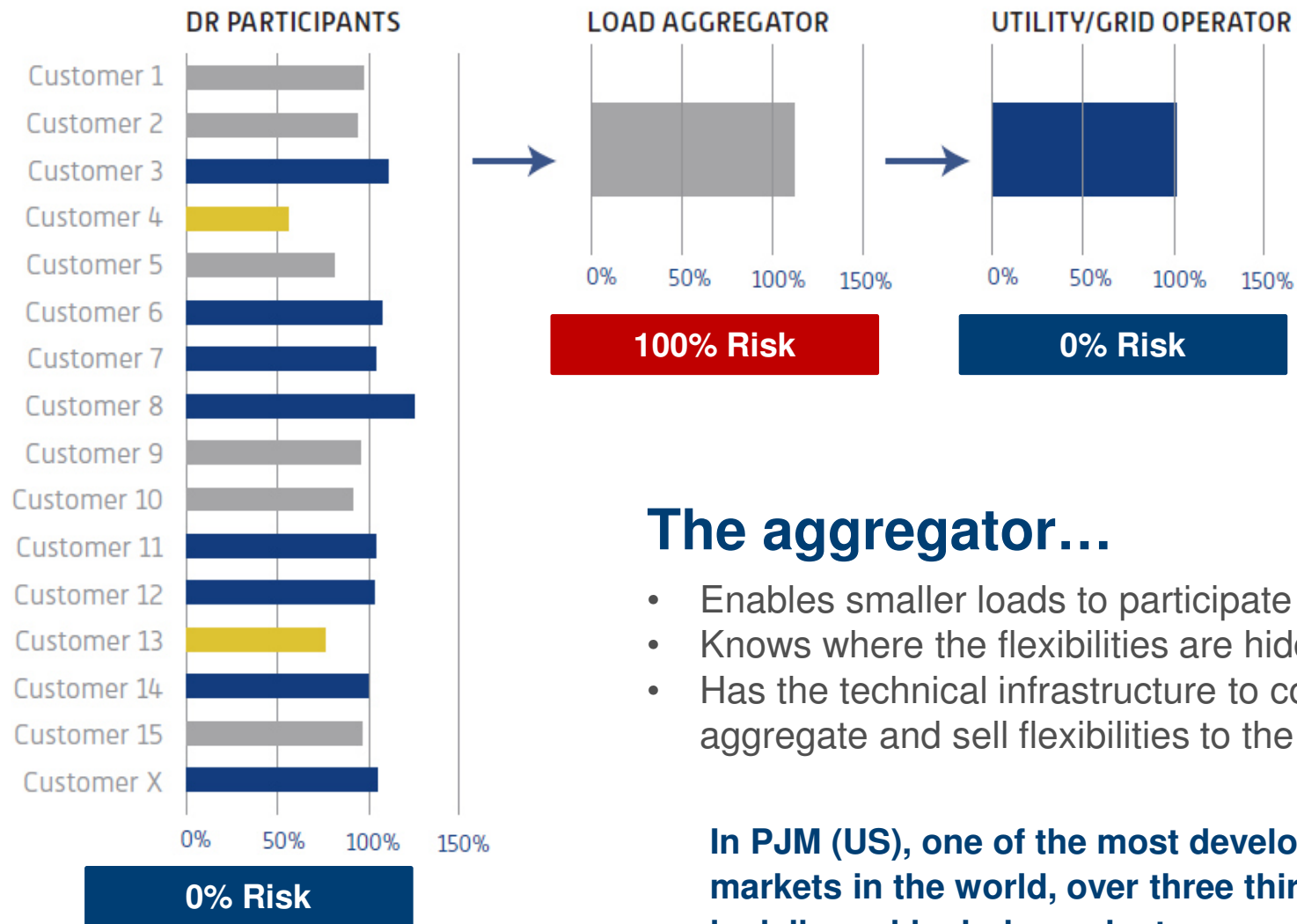
- Decentral generation (CHPs)
- Backup generation
- Heating/Cooling/Drying processes
- Ventilation processes
- Pumps, compressors
- Stirrer
- Electrolysis
- Smelter
- Refiner, grinder
- (...)



EnerNOC experience with DR around the world:
about **10% of peak load** can be brought to market

The Role of a DR-Aggregator

Aggregation is key to unlocking the DR potential and to providing a reliable resource



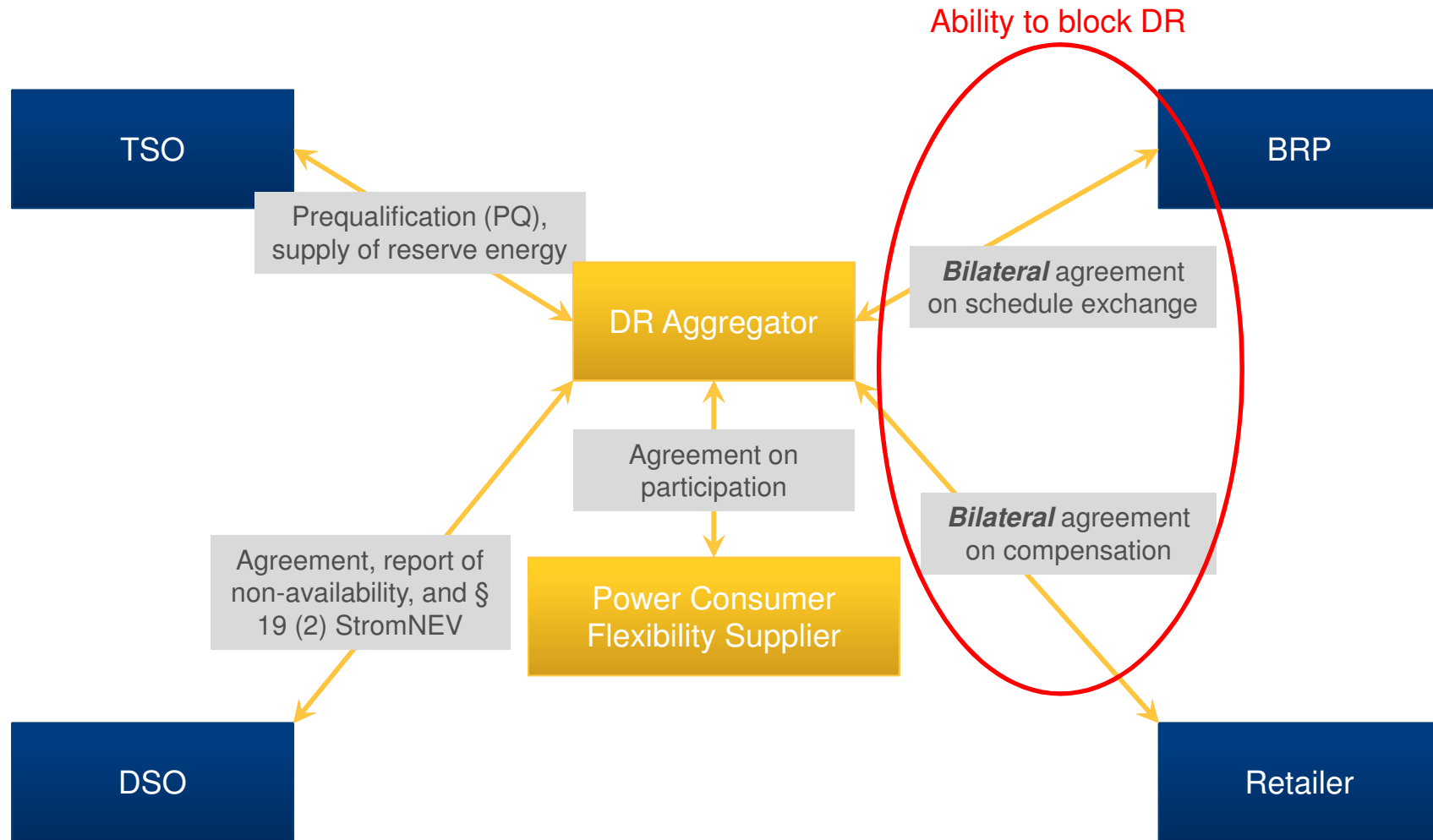
The aggregator...

- Enables smaller loads to participate
- Knows where the flexibilities are hidden
- Has the technical infrastructure to connect, aggregate and sell flexibilities to the market

In PJM (US), one of the most developed DR-markets in the world, over three thirds of DR is delivered by independent aggregators

Largest barrier for DR in Germany: Market is closed for independent aggregators through ability of BRP/retailers to block DR

Standardised framework for dealing with balancing group adjustments following a DR-dispatch are required.

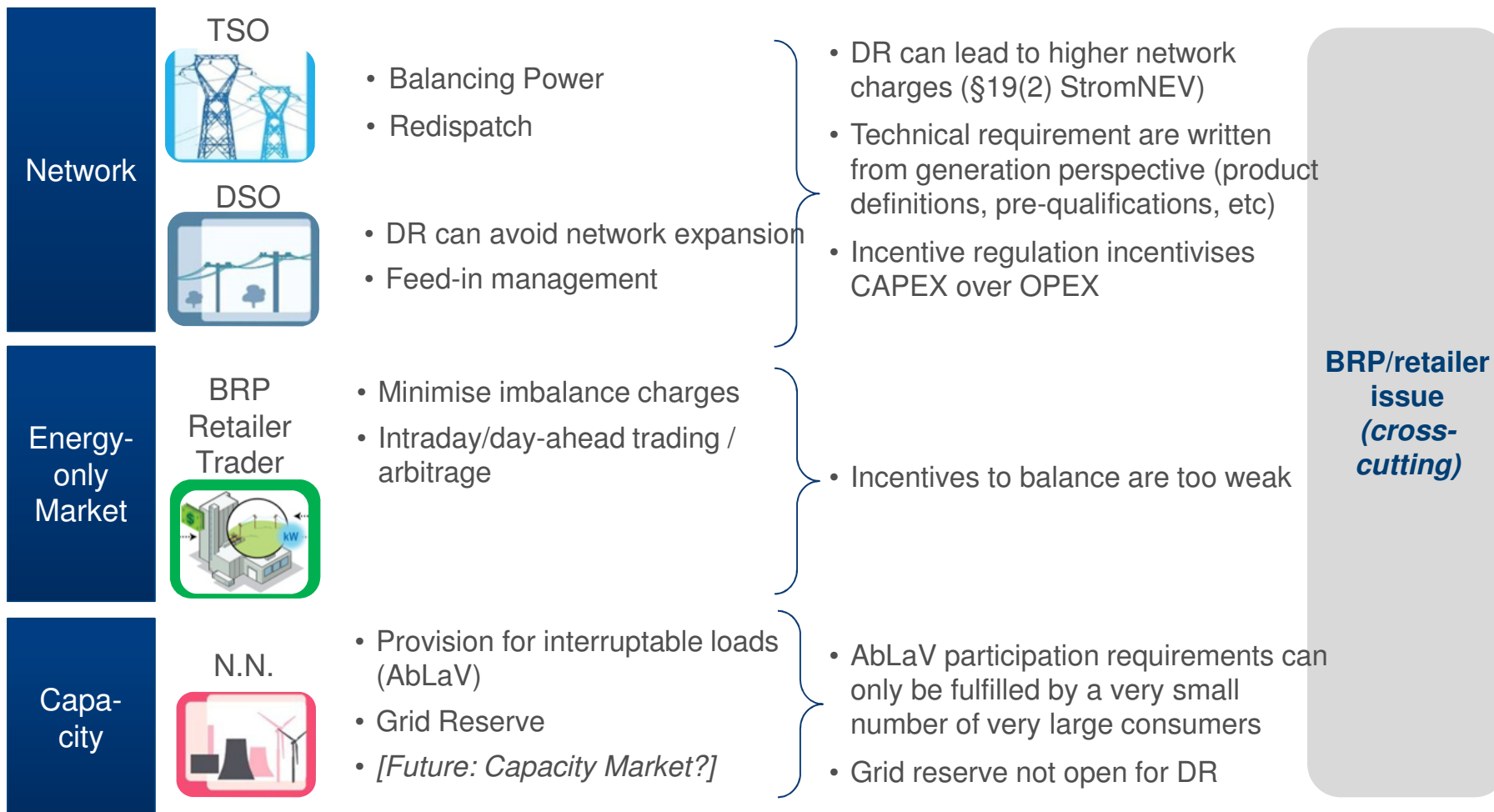


Many potential areas for DR – and many barriers

The market rules in the past have been written with generation in mind

Potential areas for DR

Barriers



BRP/retailer issue (cross-cutting)

Key take-away messages

1. DR has big potential, and can be a key component to making the Energiewende a success.
2. Need to allow new, innovative business models to compete in the market. In particular, DR-aggregators play a key role in unlocking the DR potential.
3. More generally, DR needs to be allowed to compete on equal footing with generation across all market segments – as required by the EU Energy Efficiency Directive (Article 15.8)



Andreas Flamm – Director of Regulatory Affairs Europe
andreas.flamm@enernoc.com

EnerNOC / Entelios AG
Claudius-Keller-Str 3c
81669 München

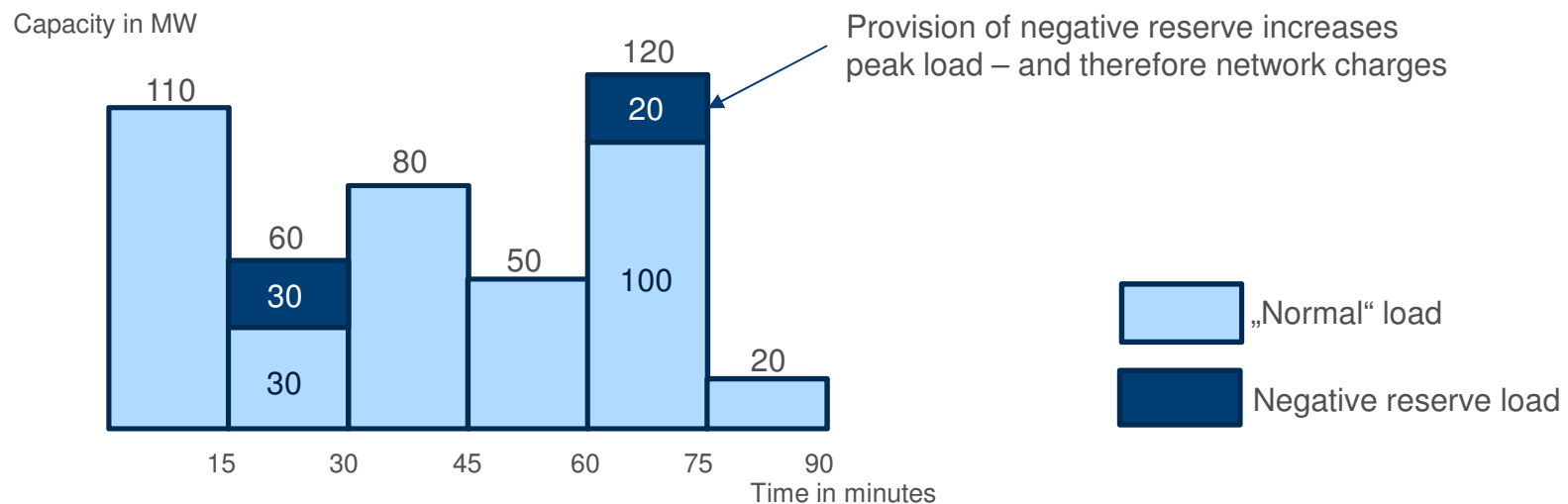


BACKUP

Key issue: Network fees and market signals are in conflict

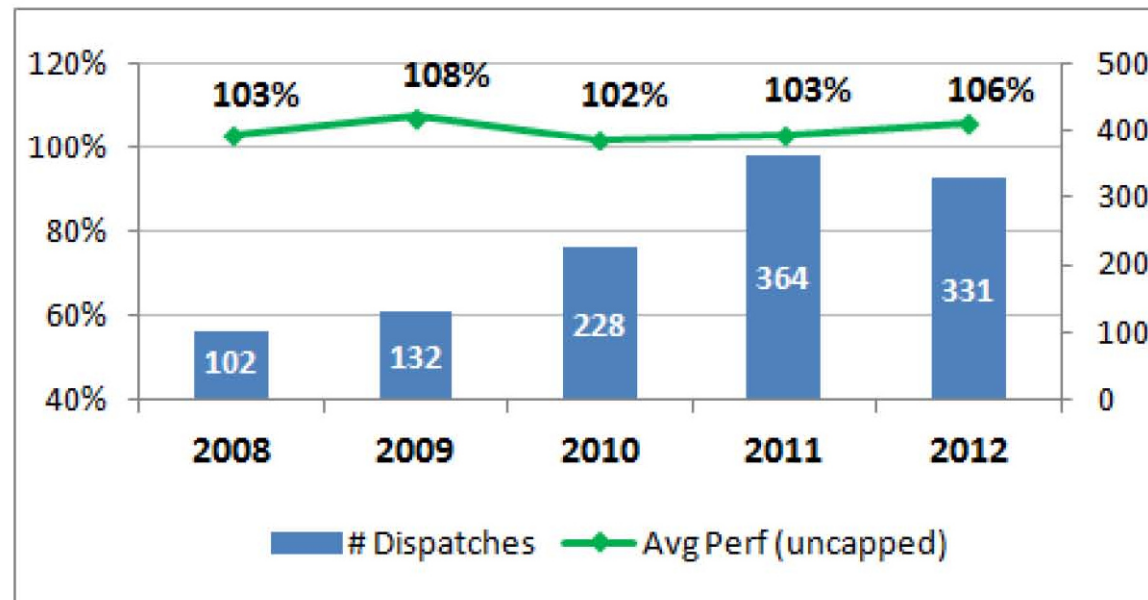
Market rules penalise DR for participating in the negative reserve market

- §19(2) StromNEV gives discounts to large consumers on their network fees if their consumption pattern is relatively flat
- However, if an large industrial firm provides negative reserve to the grid, it might lose out on the network fee discounts
- The load profile should be adjusted for that, as it is done in the AbLaV and in the Austrian market for negative reserve



Our rigorous process works

We have consistently delivered more than 100% of our committed resources across all DR programs.



Key success factors

- Our technology platform enables **automated dispatch** of multiple events simultaneously, with **real-time visibility** into performance.
- We monitor end-use loads **continuously** to ensure capacity availability.
- We **thoroughly test each site** prior to event dispatch, including acceptance tests and notification tests.
- We are experts at **building a “portfolio”** that ensures reliable delivery.