

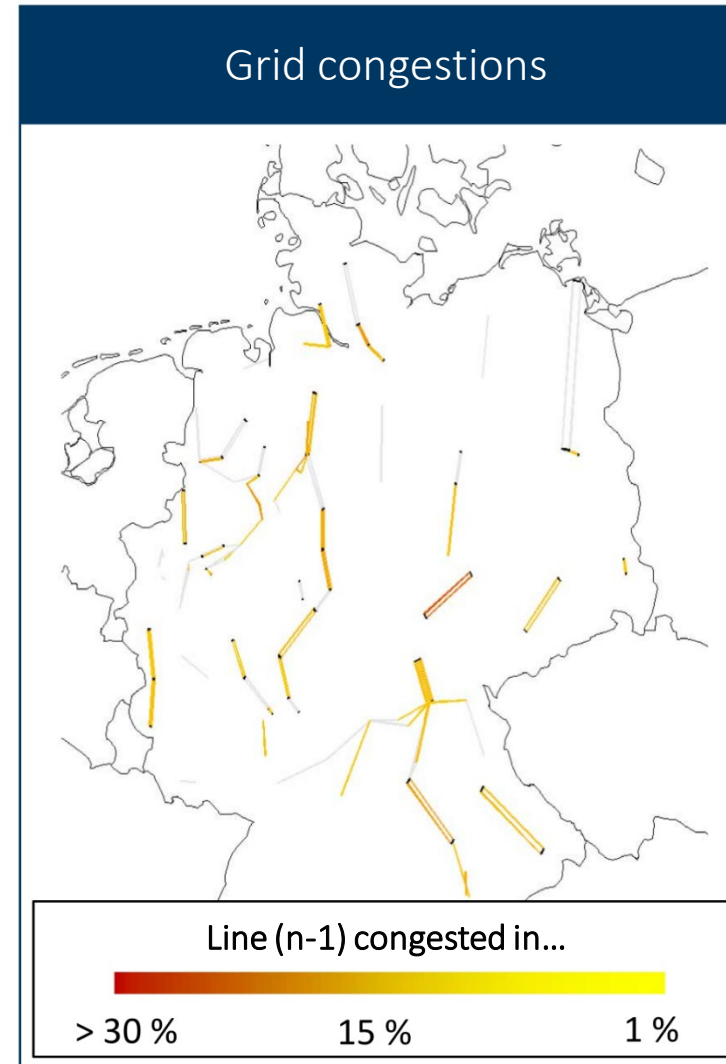
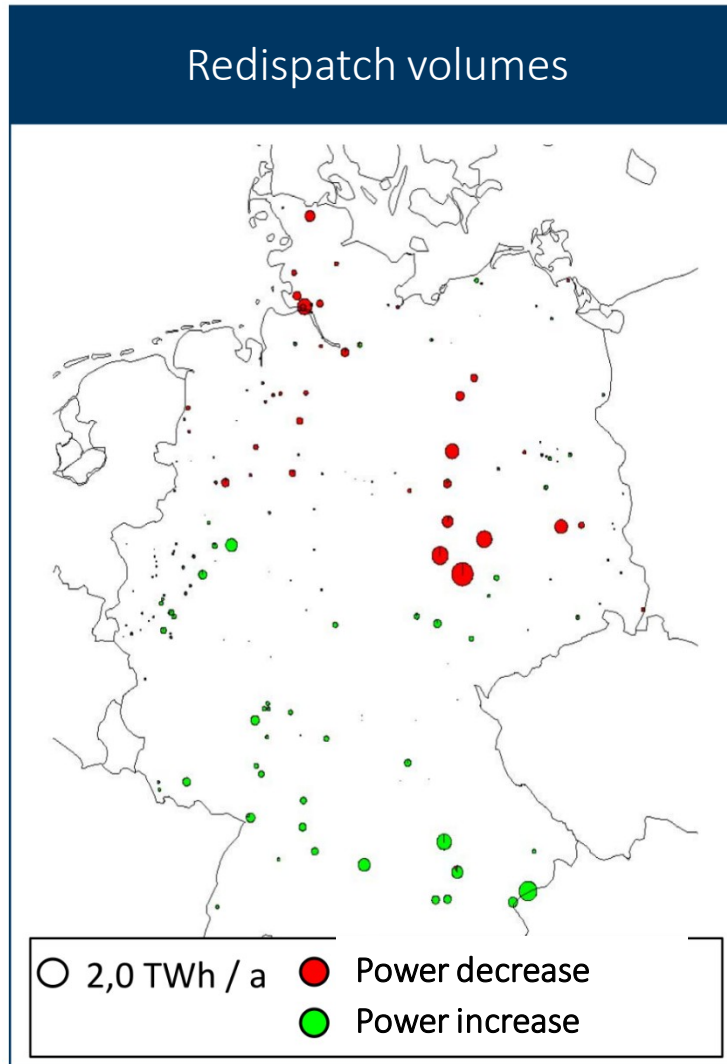


NODES – A new market design to trade decentralized flexibility

European Grid Service Markets Symposium 2019, Lucerne
July 4th, 2019
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In medium and long term, large redispatch volumes will be required (Example: Germany)



16,4 TWh/a

Redispatch volume in
Germany in year
2024

Compare
Redispatch volume
In year 2018:
9,3 TWh/a*

Nord Pool and Agder Energi take action: The NODES marketplace for decentralized flexibility is founded



**NORD
POOL**

www.energie-und-management.de 7

E&M daily

Plattform zur Vermarktung von Flexibilitäten gegründet

Die skandinavische Strombörse Nord Pool und der Konzern Agder Energi wollen mit ihrem Joint Venture Nodes einen integrierten Marktplatz zur Vermarktung von Flexibilitäten schaffen.

VON ANDREAS KÖGLER

ENERGIEHANDEL. Über die Plattform des neuen Gemeinschaftsunternehmens Nodes sollen die europäischen Märkte gebündelt werden, teilen die Joint-Venture-Partner mit. Auf dem vollautomatisierten Marktplatz können Netzbetreiber und Anbieter von Flexibilitäten in Echtzeit Kapazitäten zur Netzstabilisierung handeln.

Nach Angaben von Tom Nysted, CEO des norwegischen Energieunternehmens Agder Energi, wolle man mit dem Marktplatz ein Stromsystem schaffen, das größere Mengen an erneuerbaren Energien bewältigen und effizient sein kann. Damit könne eine Alternative zu den Netzinvestitionen geschaffen werden, die gleichzeitig zusätzlichen Wert für Netzbetreiber und Flexibilitätsanbieter bringe.

Die Plattform von Nodes wird von Agder Energi bereits in Südnorwegen betrieben. Über die europaweite Ausdehnung des Marktplatzes verhandle das Unternehmen derzeit mit mehreren interessierten Marktteilnehmern.

Agder Energi ist nach eigenen Angaben der drittgrößte Wasserkraft-Stromerzeuger in Norwegen. In Deutschland hatte das Unternehmen im vergangenen Jahr die Portfoliomanagement-Gesellschaft Markedskraft Deutschland und den Nachfrage-Manager Entelios übernommen. Zudem hatten sich die Skandinavier mit 61,4 % an dem Direktvermarkter Nordgrön Energie beteiligt.



agder energi

50%

50%

NODES

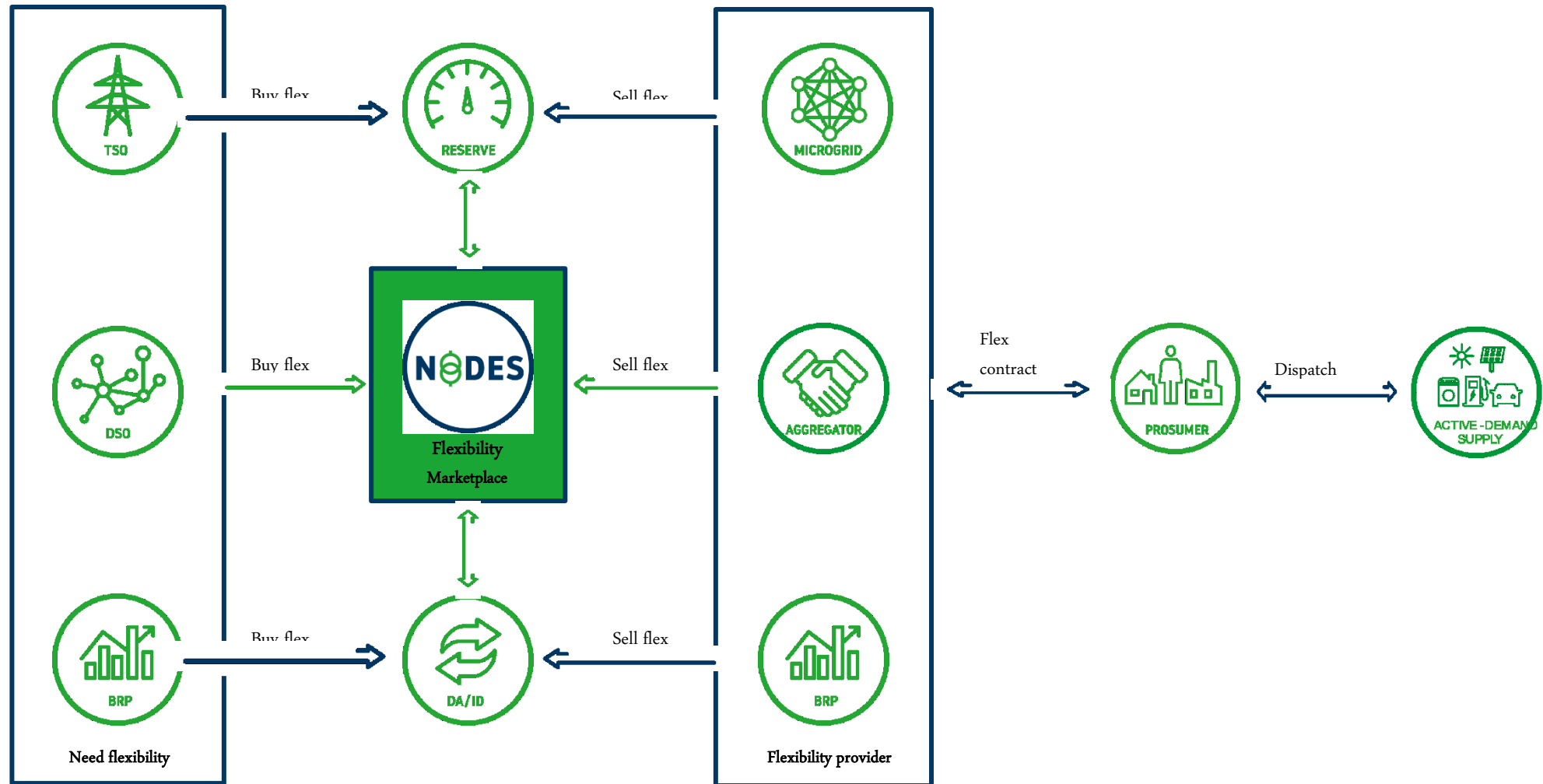
A large, thick, green stylized letter 'N' that curves around the left side of the slide.

Building Europe's most customer-centric, integrated energy marketplace to unlock the value of local flexible power resources and support the drive to a sustainable, emission free future.

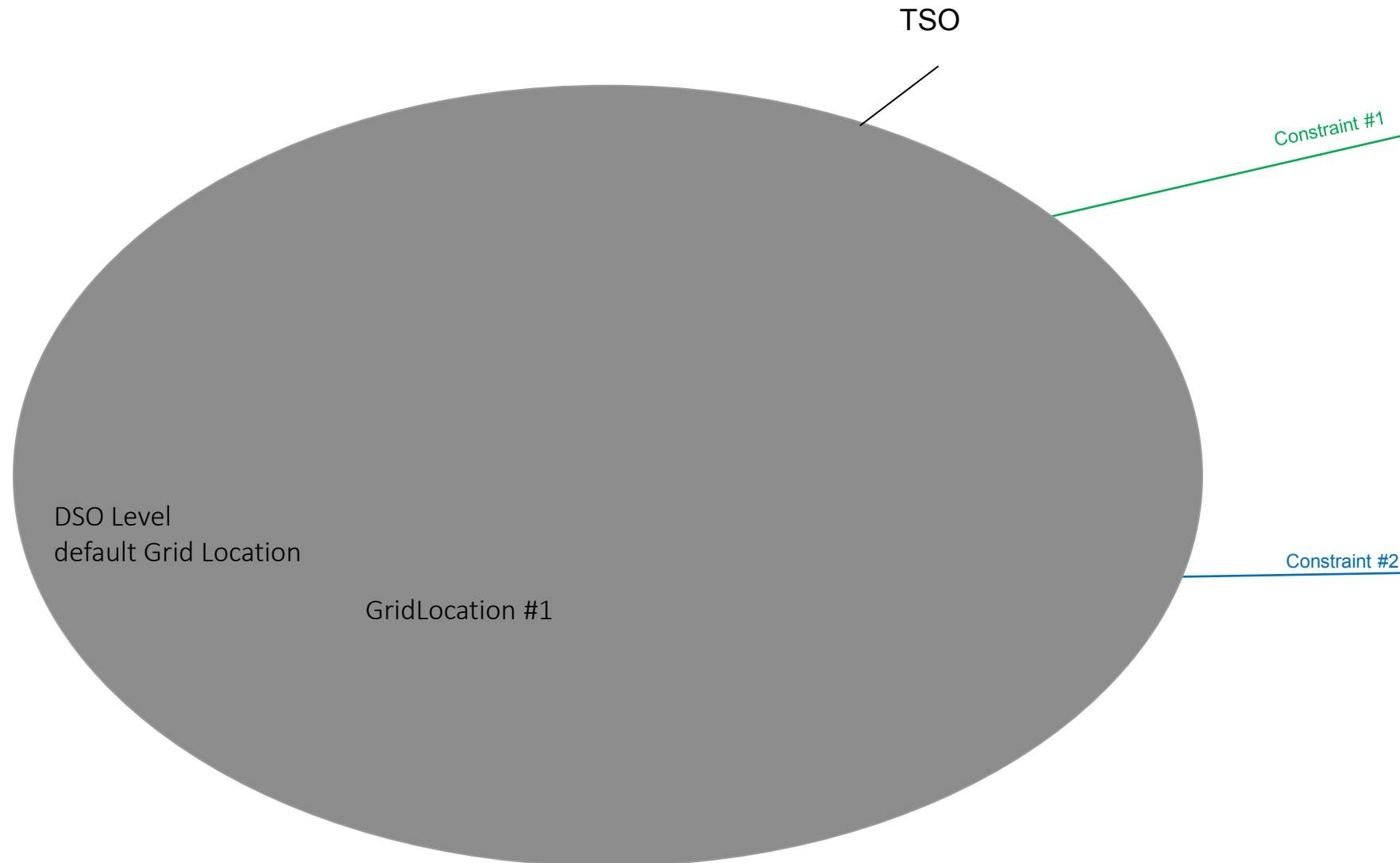
www.NODESmarket.com



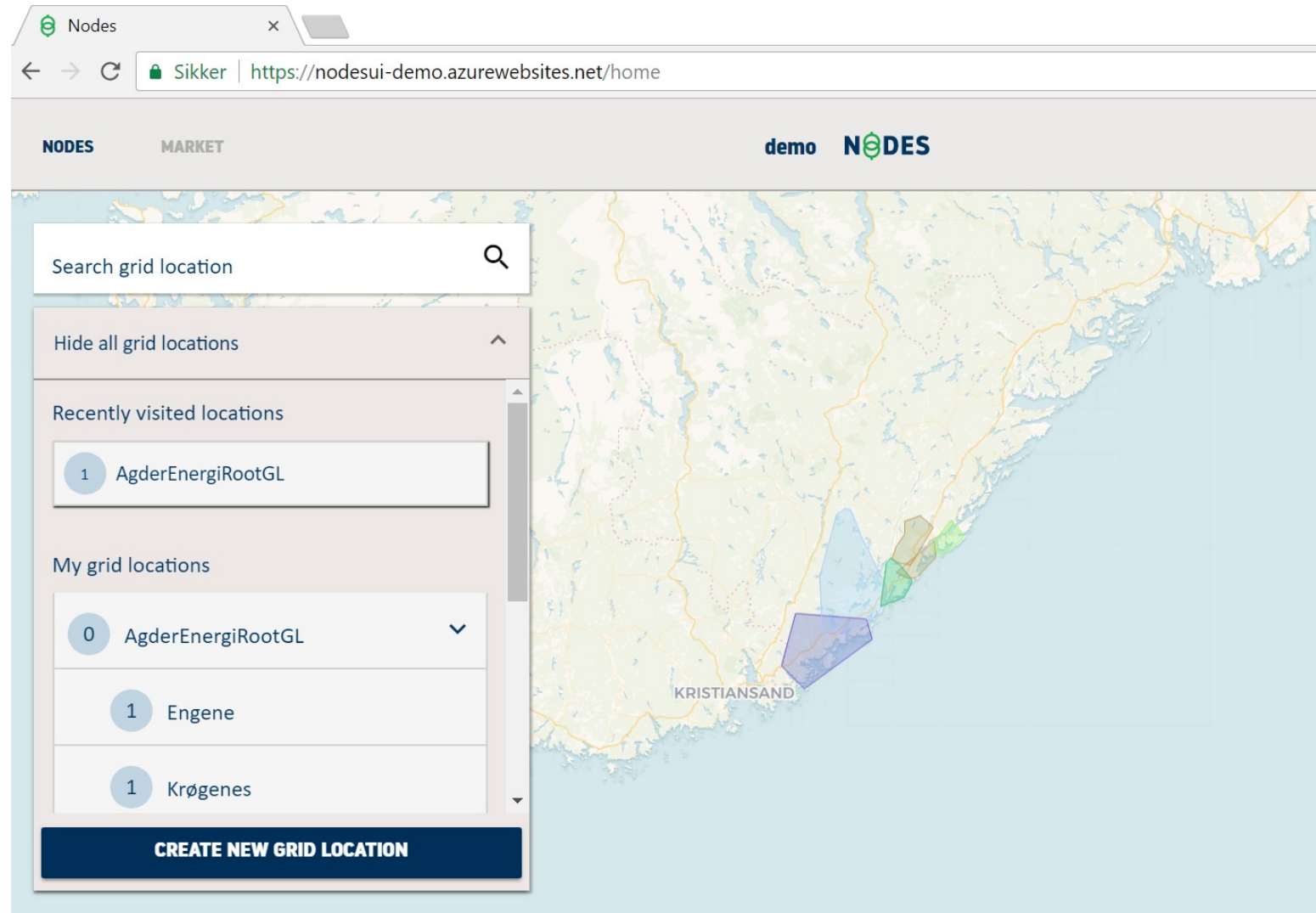
NODES helps unlocking the value of local flexibility while maintaining the existing power market design



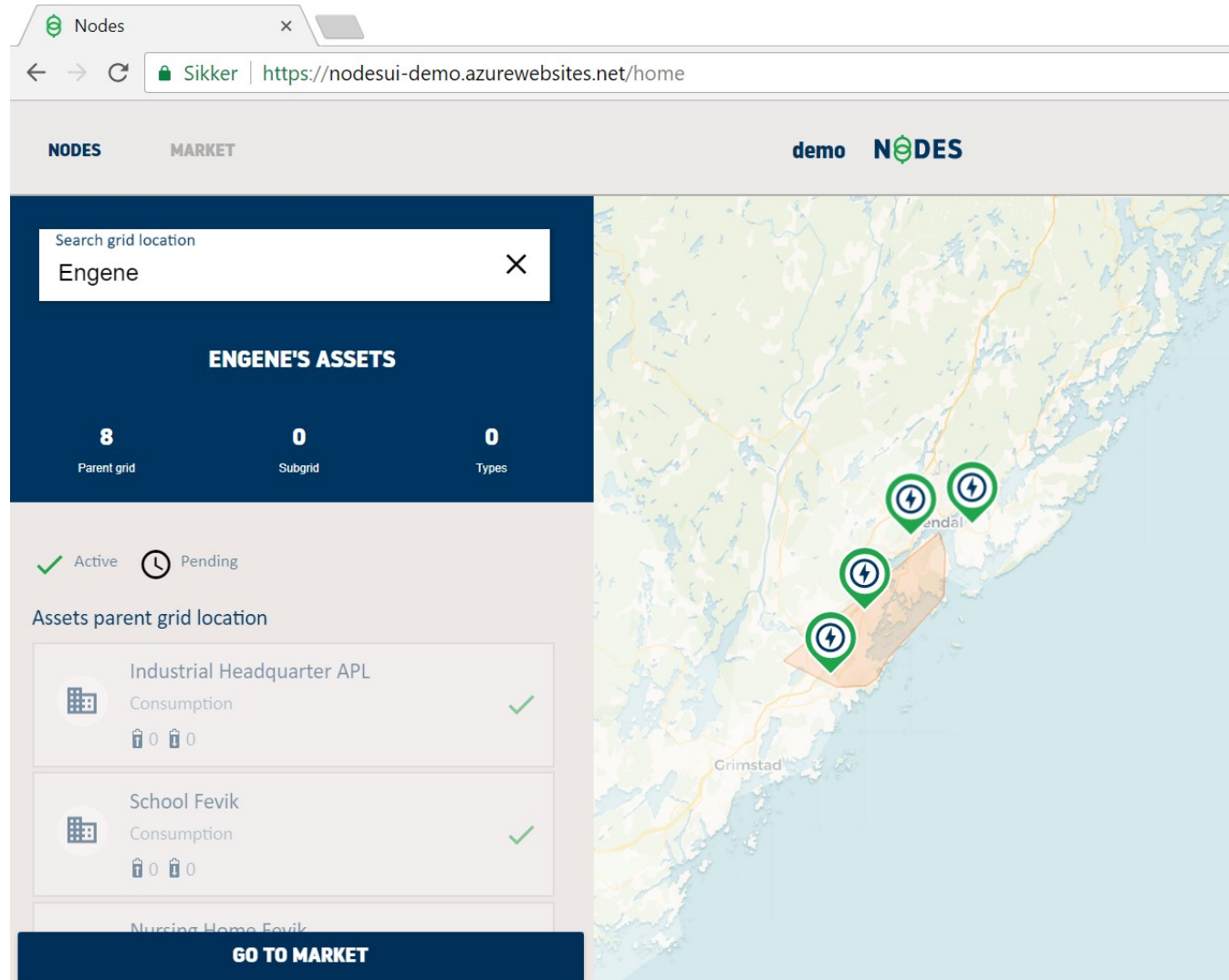
System operators know where their constraints are –
On NODES, they can define grid locations accordingly



System Operator view (example)

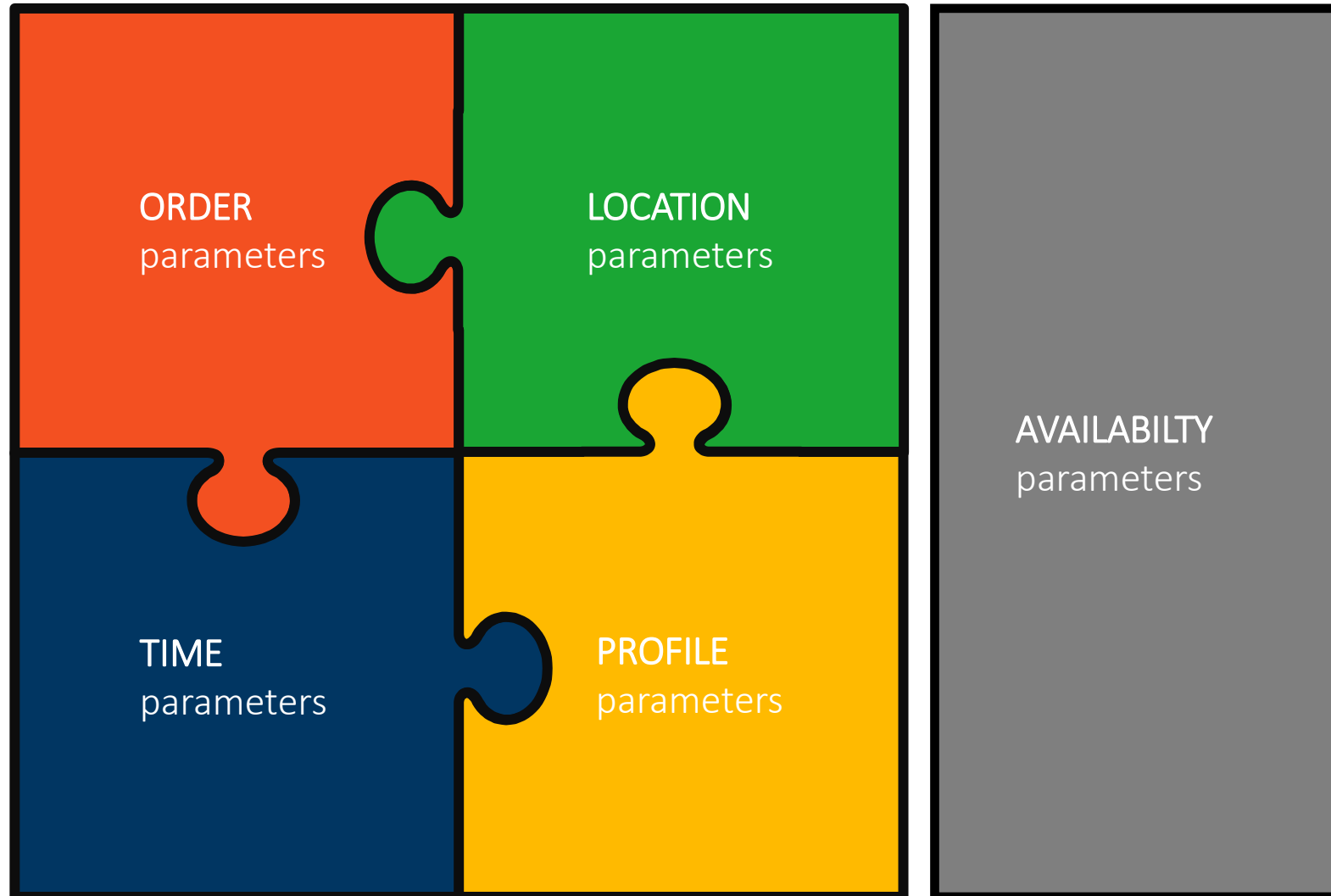


Flexibility Service Provider view (example)



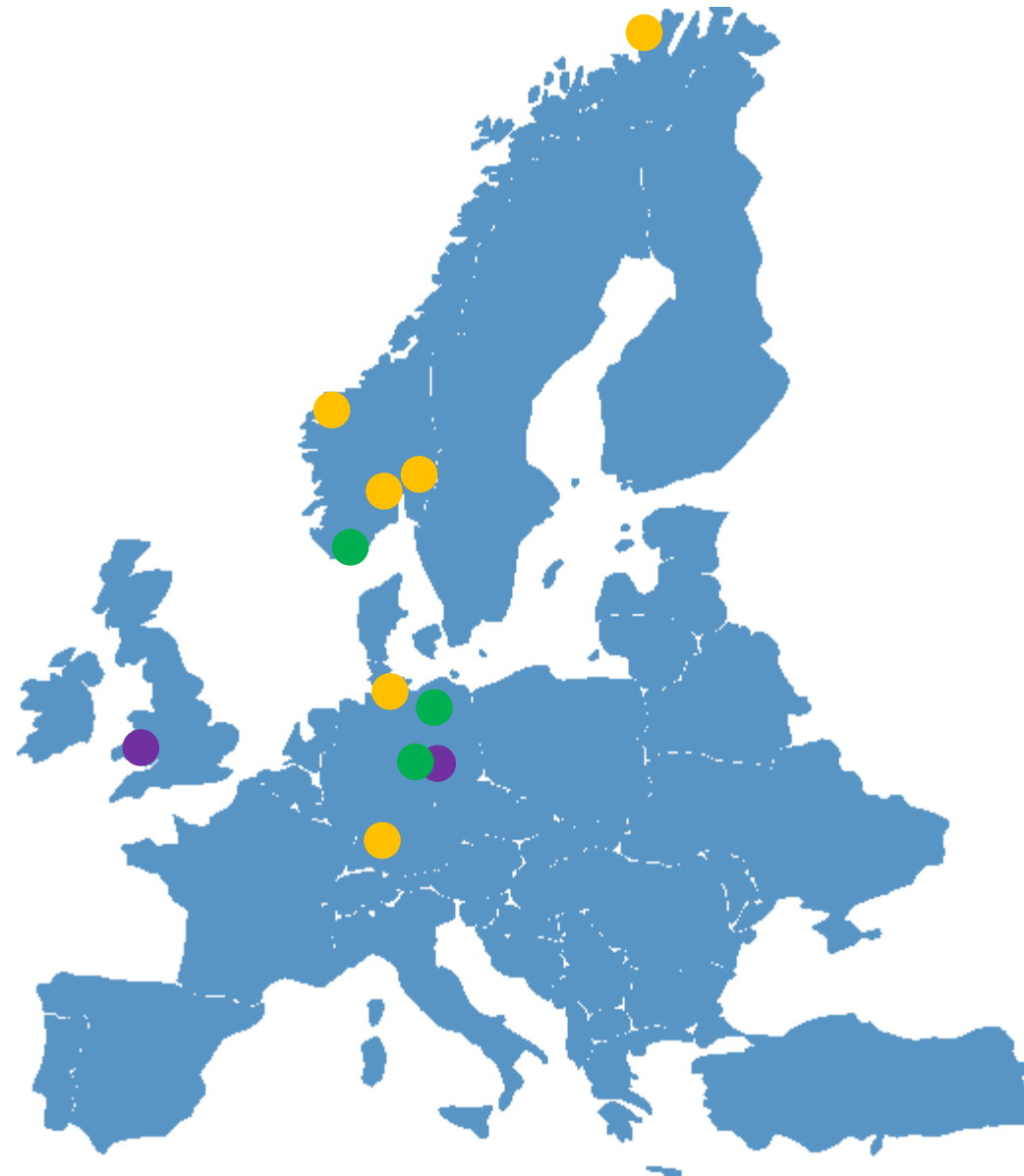
The screenshot shows a web application interface for a Flexibility Service Provider. The browser address bar displays the URL <https://nodesui-demo.azurewebsites.net/home>. The application has a top navigation bar with 'NODES' and 'MARKET' tabs, and a 'demo NODES' label. On the left, a search bar contains 'Engine'. Below it, a section titled 'ENGINE'S ASSETS' shows 8 Parent grid, 0 Subgrid, and 0 Types. A legend indicates 'Active' (green checkmark) and 'Pending' (clock icon). The 'Assets parent grid location' section lists three assets: 'Industrial Headquarter APL' (Consumption, 0, 0, green checkmark), 'School Fevik' (Consumption, 0, 0, green checkmark), and 'Nursing Home Fevik' (partially visible). A 'GO TO MARKET' button is at the bottom. On the right, a map shows the location of the assets, with a highlighted area around 'Crimstad' and 'Endal'.

Parameters instead of fixed products

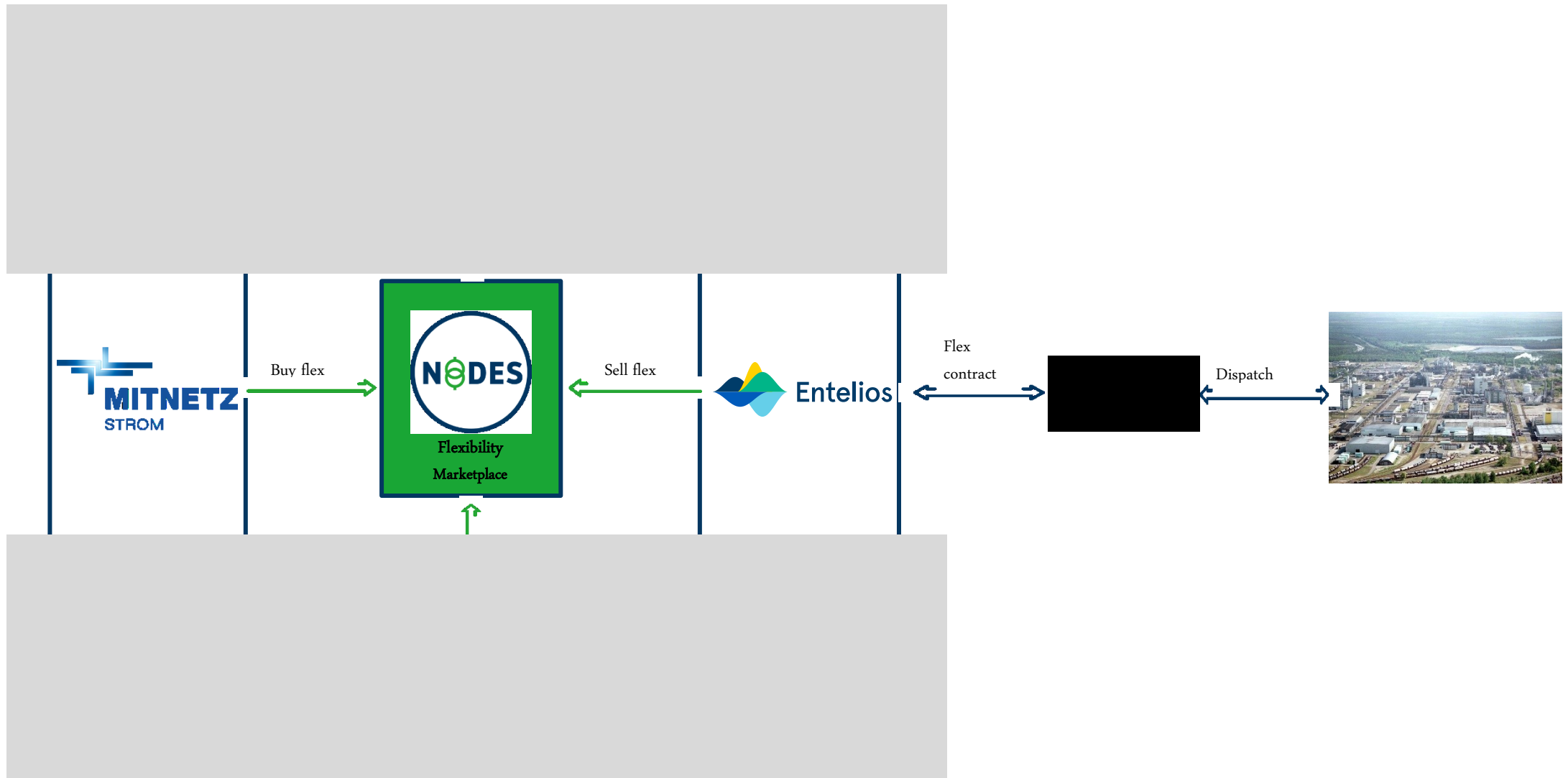


NODES is already active in several pilot projects across Europe

- Marketplace in live operation
- Test installation announced
- Test installation planned



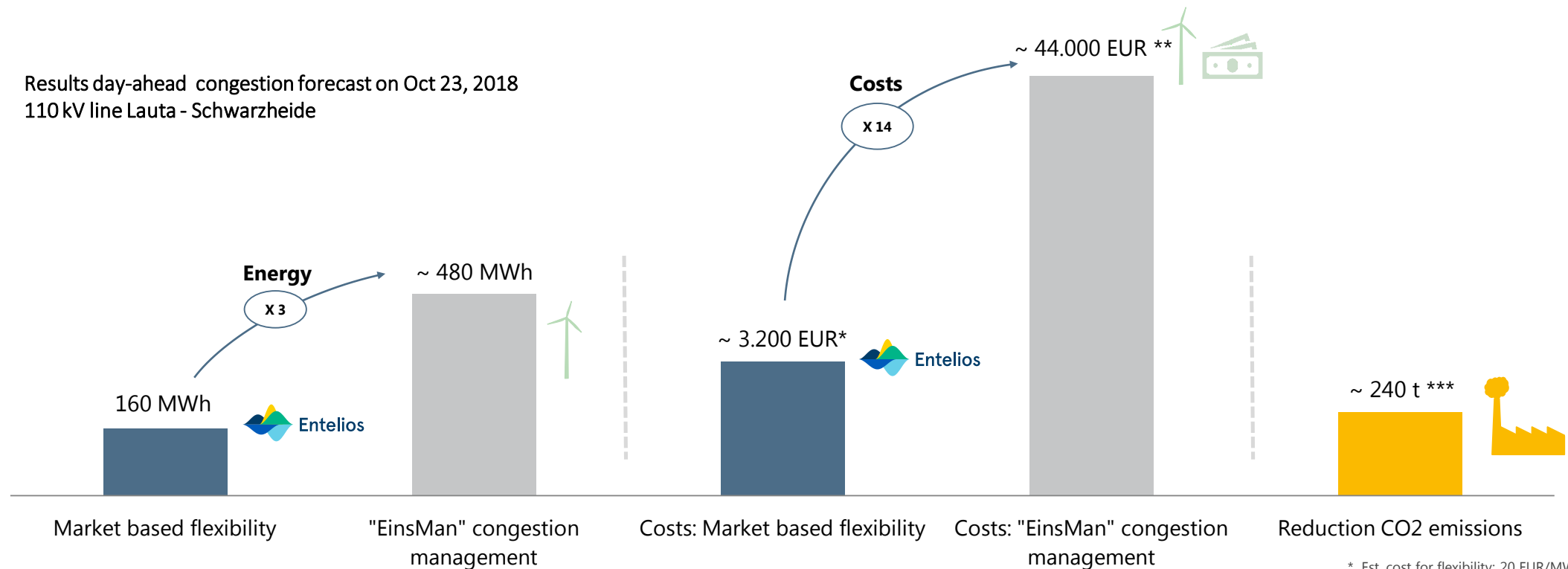
Mitnetz case – Too much (renewable) production in the high voltage grid



Using market based flexibility promises high efficiency gains – In the MITNETZ/Entelios/BASF pilot:

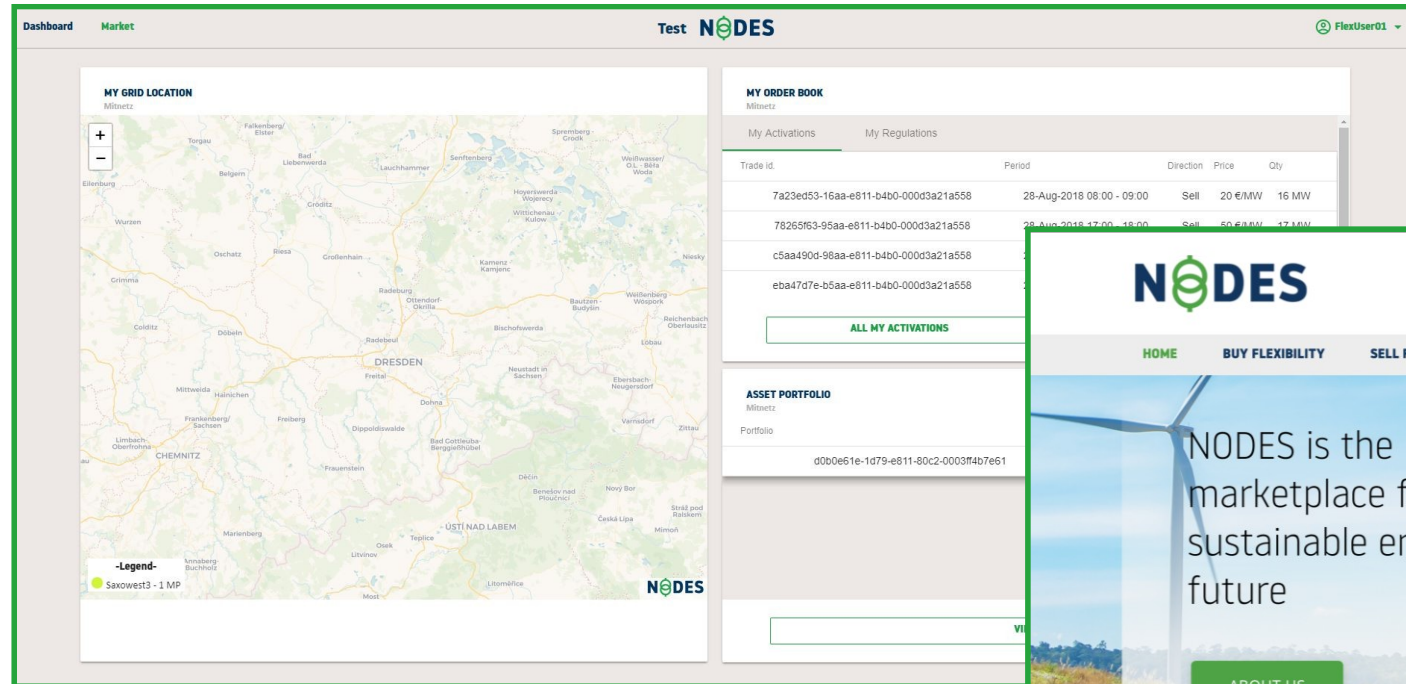
- ✓ Lower specific costs per MWh of flexibility
- ✓ As a result: Overall costs for congestion management to be lowered by an order of magnitude
- ✓ Additional RES can be used – instead of being curtailed

Results day-ahead congestion forecast on Oct 23, 2018
110 kV line Lautz - Schwarzheide



* Est. cost for flexibility: 20 EUR/MWh
 ** Weighted avg RES compensation in region 92 EUR/MWh
 *** Avg. 489 g/kWh

Flexibility service providers are invited to test the NODES marketplace also within their organizations!



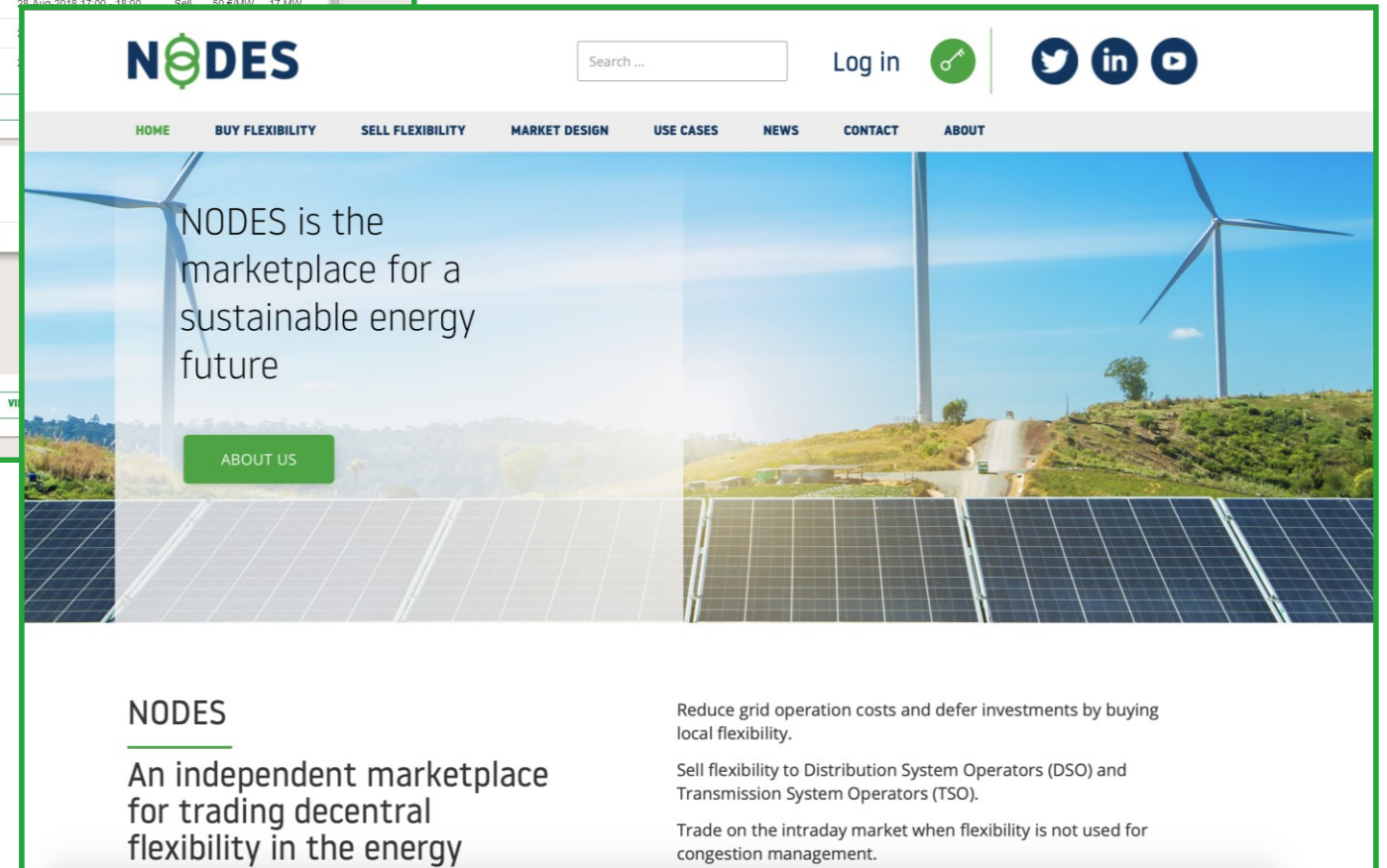
The screenshot shows the 'Test NODES' dashboard with a user profile 'FlexUser01'. It features a map of Saxony, Germany, with a legend indicating 'Saxwest3 - 1 MP'. The dashboard is divided into three main sections: 'MY GRID LOCATION', 'MY ORDER BOOK', and 'ASSET PORTFOLIO'.

MY ORDER BOOK

Trade Id	Period	Direction	Price	Qty
7a23ed53-16aa-e811-b4b0-000d3a21a558	28-Aug-2018 06:00 - 09:00	Sell	20 €/MWh	16 MW
78265f63-95aa-e811-b4b0-000d3a21a558	28-Aug-2018 17:00 - 18:00	Sell	50 €/MWh	17 MW
c5aa490d-98aa-e811-b4b0-000d3a21a558				
eba47d7e-b5aa-e811-b4b0-000d3a21a558				

ASSET PORTFOLIO

Portfolio
d0b0e61e-1d79-e811-80c2-0003ff4d7661



The landing page features the NODES logo, a search bar, and social media icons. The main navigation bar includes links for HOME, BUY FLEXIBILITY, SELL FLEXIBILITY, MARKET DESIGN, USE CASES, NEWS, CONTACT, and ABOUT. The hero section displays a background image of wind turbines and solar panels with the text: 'NODES is the marketplace for a sustainable energy future'. Below this is an 'ABOUT US' button.

NODES

An independent marketplace for trading decentral flexibility in the energy

- Reduce grid operation costs and defer investments by buying local flexibility.
- Sell flexibility to Distribution System Operators (DSO) and Transmission System Operators (TSO).
- Trade on the intraday market when flexibility is not used for congestion management.

NØDES