



CoordiNet

IDE WORKSHOP 06/04/2020



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824414

Introduction

Large-scale TSO-DSO-Consumer demonstrations of innovative network services through demand response, storage and small-scale distributed generation

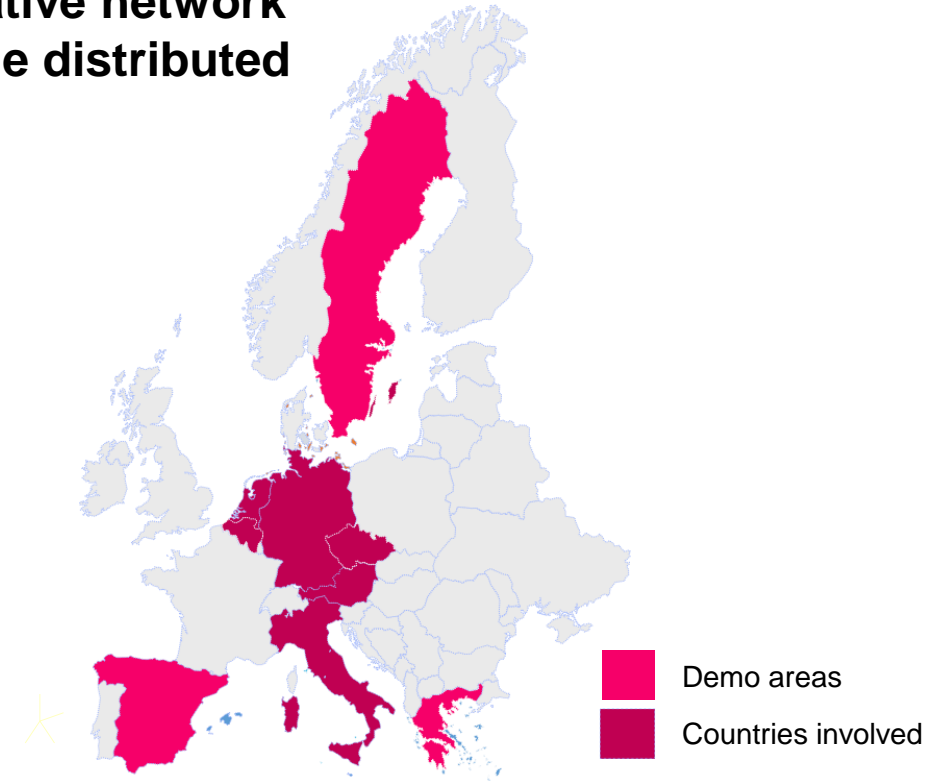
Project Timeline: 1° of January 2019 – 30° of June 2022

Project Budget and funding : 19.2M€ - 15.1M€

Total number of partners: 23 + 10 Linked Third Parties

Objectives:

- Demonstrate the activation and provision of services through a TSO-DSO coordination
- Define and test standard products that provide services to the network operators
- Develop a TSO-DSO-consumer collaboration platform in demonstration areas to pave the way for the interoperable development of a pan-European market



We are live for DA capacity market



3 demosites in demo 1



Uppland

94 MW, electric boiler, heating pumps aggregator, gas turbine, EV charger, waste incineration



Gotland

24 MW, electric boiler, heating pumps



Skåne

60 MW, heating pumps, gas turbines, gensets, ecto-grid

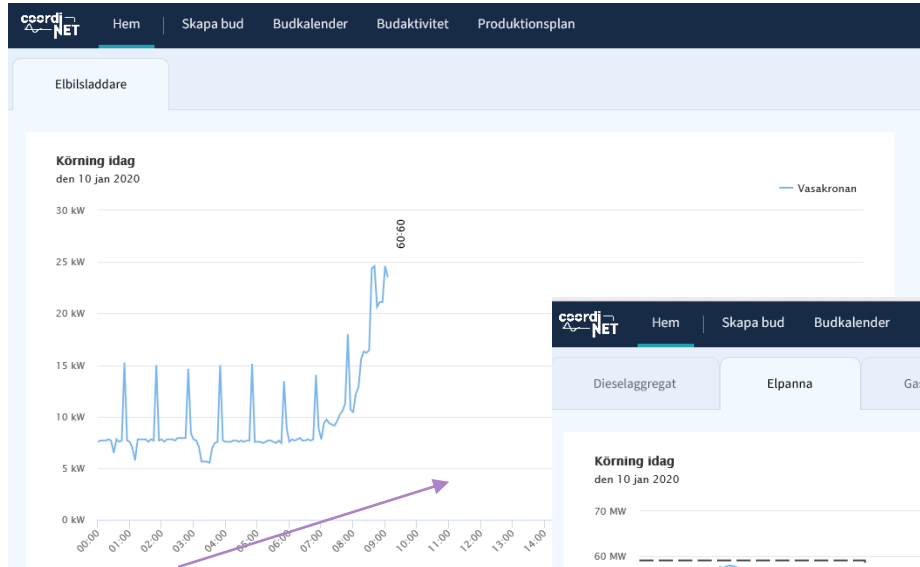
For DA market we have developed

- Market design and coordination
- Business models & remuneration
- Forecasting for grid status
- IT-infrastructure
- Platform for bids & market

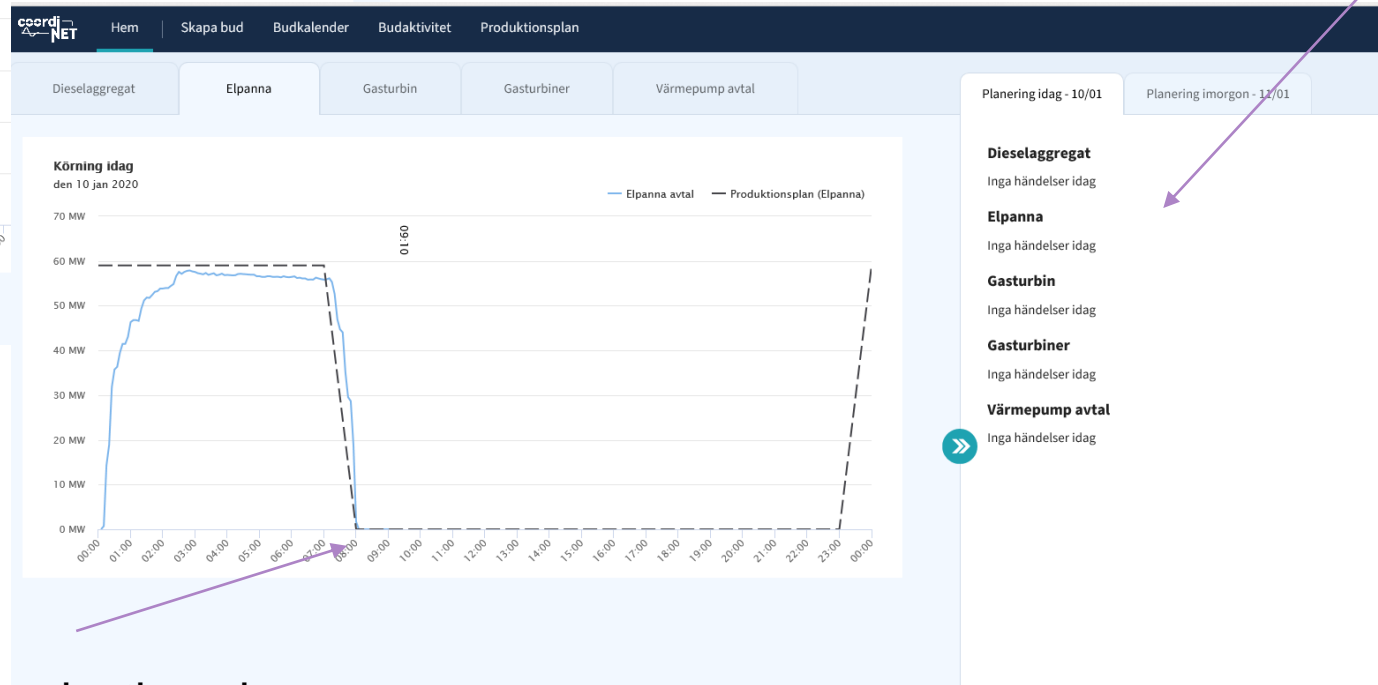
In dialogue with Energy Authorities



The view for the flex provider



FSP load curve



FSP production plan

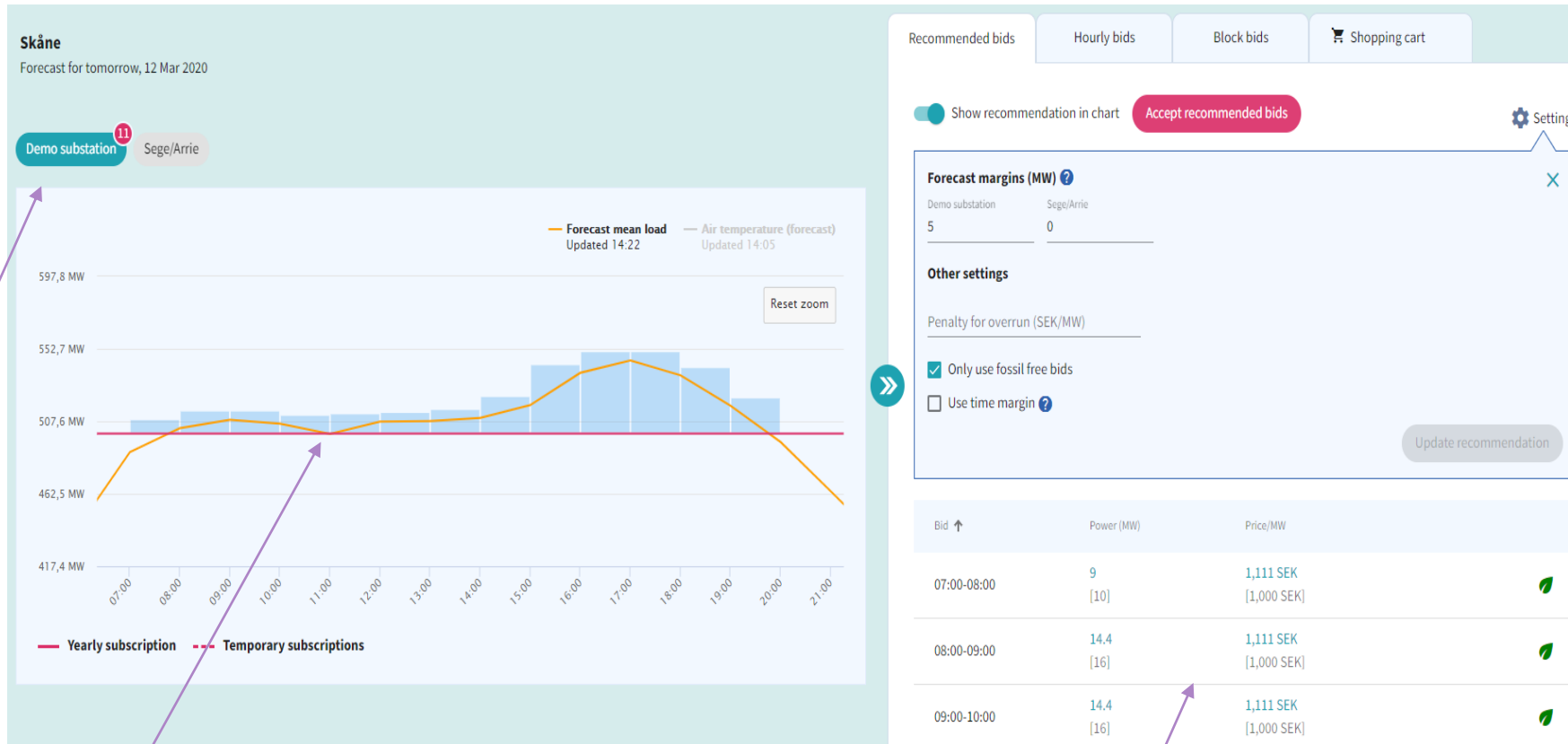
FSP information on assets and orders

Planering idag - 10/01 Planering imorgon - 11/01

- Dieselaggregat**
Inga händelser idag
- Elpanna**
Inga händelser idag
- Gasturbin**
Inga händelser idag
- Gasturbiner**
Inga händelser idag
- Värmepump avtal**
Inga händelser idag

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The view for DSO operator



Grid need

Load forecasting & flexibility recommended bids

View of bids unidentified

Integration with Nord Pool Day-ahead

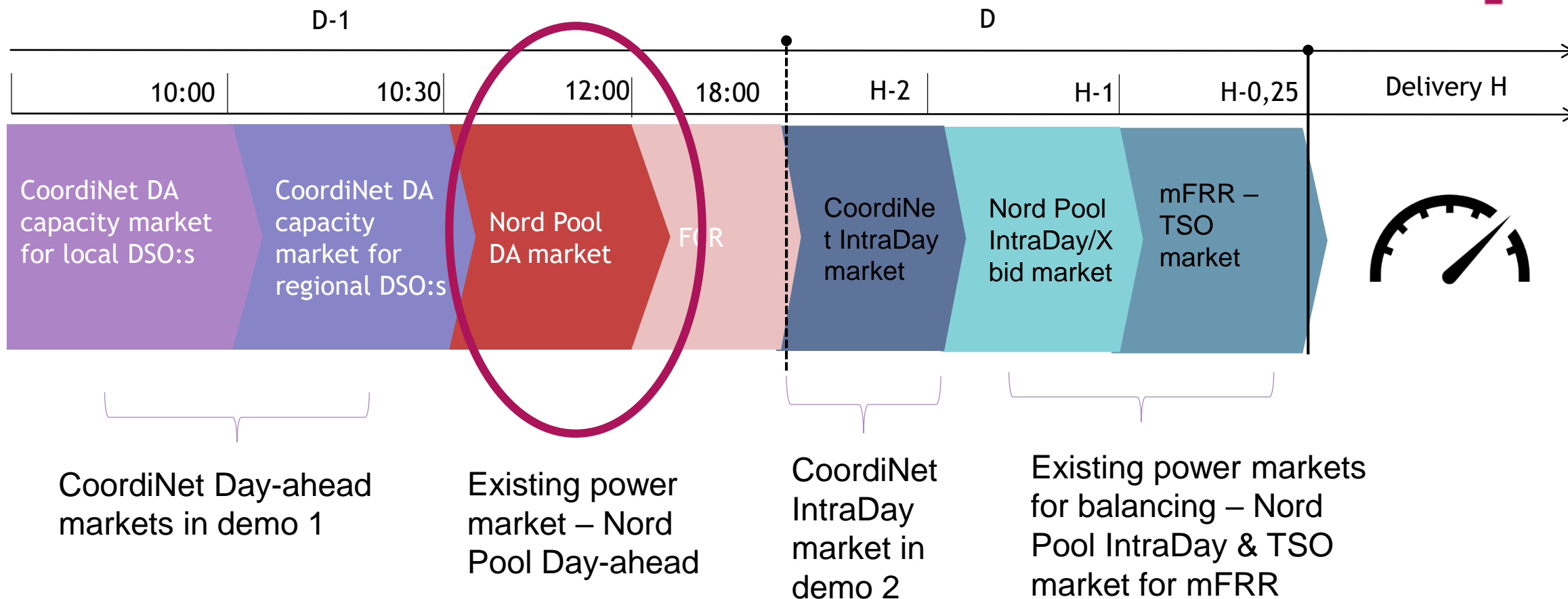


- Nord Pool Day-ahead is the leading spot market for power trading in the Nordic countries
- Majority of all Nordic power is traded here
- The actors on the market are mainly balance responsible parties (BRPs) who trades on behalf of their consumers and producers
- The market closes daily at 12:00
- Integration: our CoordiNet day-ahead market takes place prior to the Nord Pool Day-ahead market in order for the BRPs of the flexibility suppliers to adjust their energy production/consumption at the Nord Pool market

Integration with TSO mFRR-market

- TSO mFRR market is one of the frequency markets
- Part of Nordic frequency is traded here
- The market closes daily at 45 minutes before delivery time
- Integration: Our CoordiNet intra-day market will forward unused bids to the mFRR market

Market chronology - congestion management and sync with existing energy markets

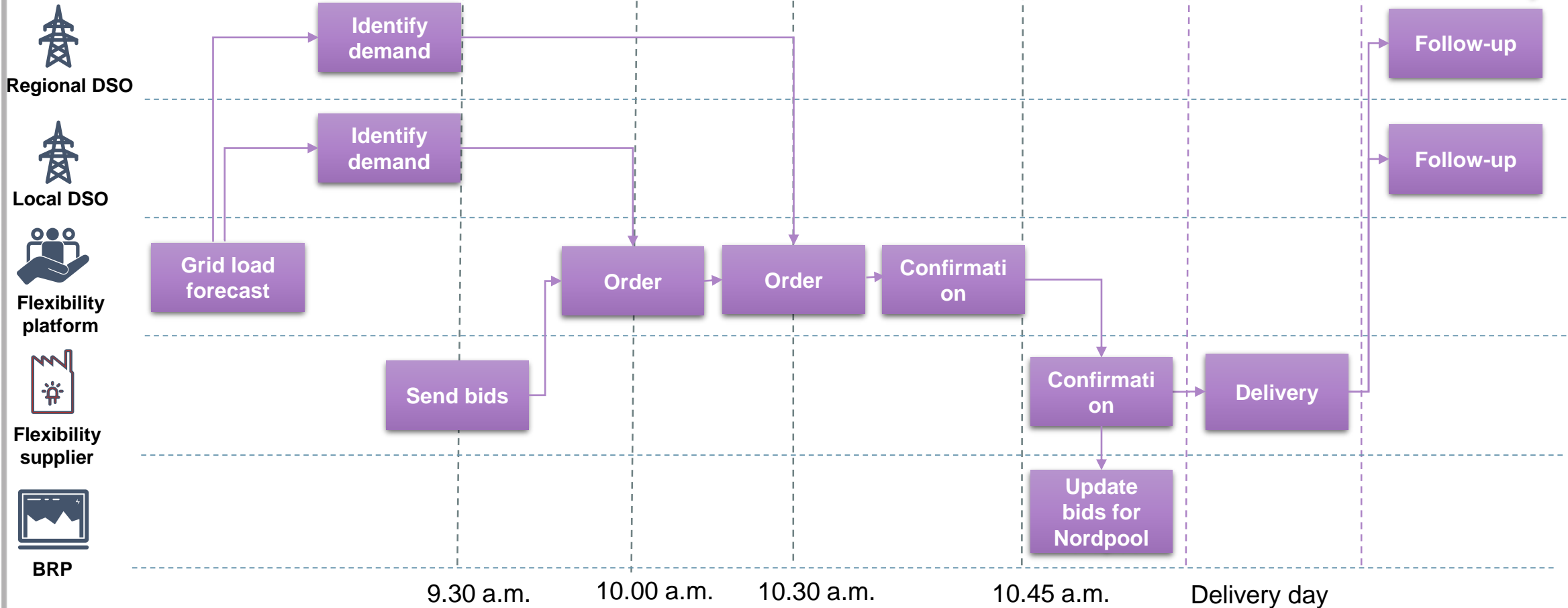


→ All CoordiNet markets in Sweden are design to fit into the chronology of the existing energy markets, mFRR bids will be forwarded from the CoordiNet

Operational Process Steps - Demo 1



Process for CoordiNet Day-Ahead market



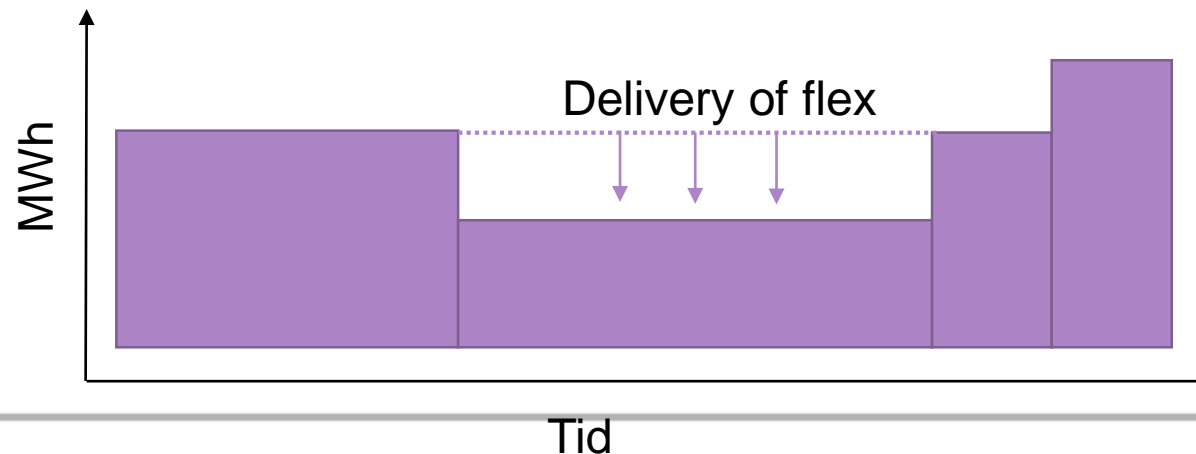
This gives the BRPs time to adjust bids on Nord Pool Day-ahead before it closes at 12:00

Remuneration

- ❑ I demo 1 different methods are tested
- ❑ Goal demo 2: standardized methods for the products
- ❑ Delivery of flexibility = real time change of consumption (kW)
- ❑ How?
 - ❑ Some kind of "baseline" is needed
 - ❑ Example baseline: forecasting, customer plan dayahead, börvärde...

Different methods

1. Deviation from customer forecasting
2. Deviation from grid state forecasting
3. Control of steering system of the asset (börvärde)
4. Customer plan
5. " Trust



CoordiNet market: Demo 1

	Skåne	Uppland
Markets	1	2
Flex providers	5	5
Resources	6	9 + 1 aggregator (340 houses)
Medium price per order (SEK/MWh)	1670	264
Highest bidding price (SEK/MWh)	4000	2500
Volume (MWh)	65	3264

Preliminary conclusions



The following conclusions can be drawn from first winters successful operation of the CoordiNet Swedish flexibility market for congestion management:

- Compensation to flexibility providers needs to be evaluated to find the right balance between availability and activation remuneration
- Flexibility providers ask for more digitalisation of the platform and better knowledge from provider of control systems
- The coordination scheme worked very well. Critical is to get production plan for the load forecasting in time.
- Load forecasting is important and requires integration of planned operation of major loads to be accurate
- The platform proved its value to DSO control room operators by greatly increased visibility of the upcoming grid situation
- The development of the platform and the flexibility market by a DSO has shown to be extremely valuable in competence development, mindset and culture
- Developing and operating the platform as an integral part of the DSO grid planning and operations provides understanding for needs, changes and possibilities when acting DSO with higher level of visibility
- The needed dialogue between DSO and TSO creates new values in understanding how better coordination can lead to a more efficient grid use
- Acting as a System Operator the DSO gains the ability to use the grid more efficient. This provides major gains for the DSO arising through new possibilities to use the infrastructure for electricity and heating in a more coordinated manner. In the future this will also strengthen the capability to cope with new kind of loads like electric charging and solar power.



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THANK YOU



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