



Challenges with the Danish Pricing Model – Market Model 2.0

**CITIES 2nd Consortium Meeting
DTU, Lyngby Campus, Denmark
26 May 2015**



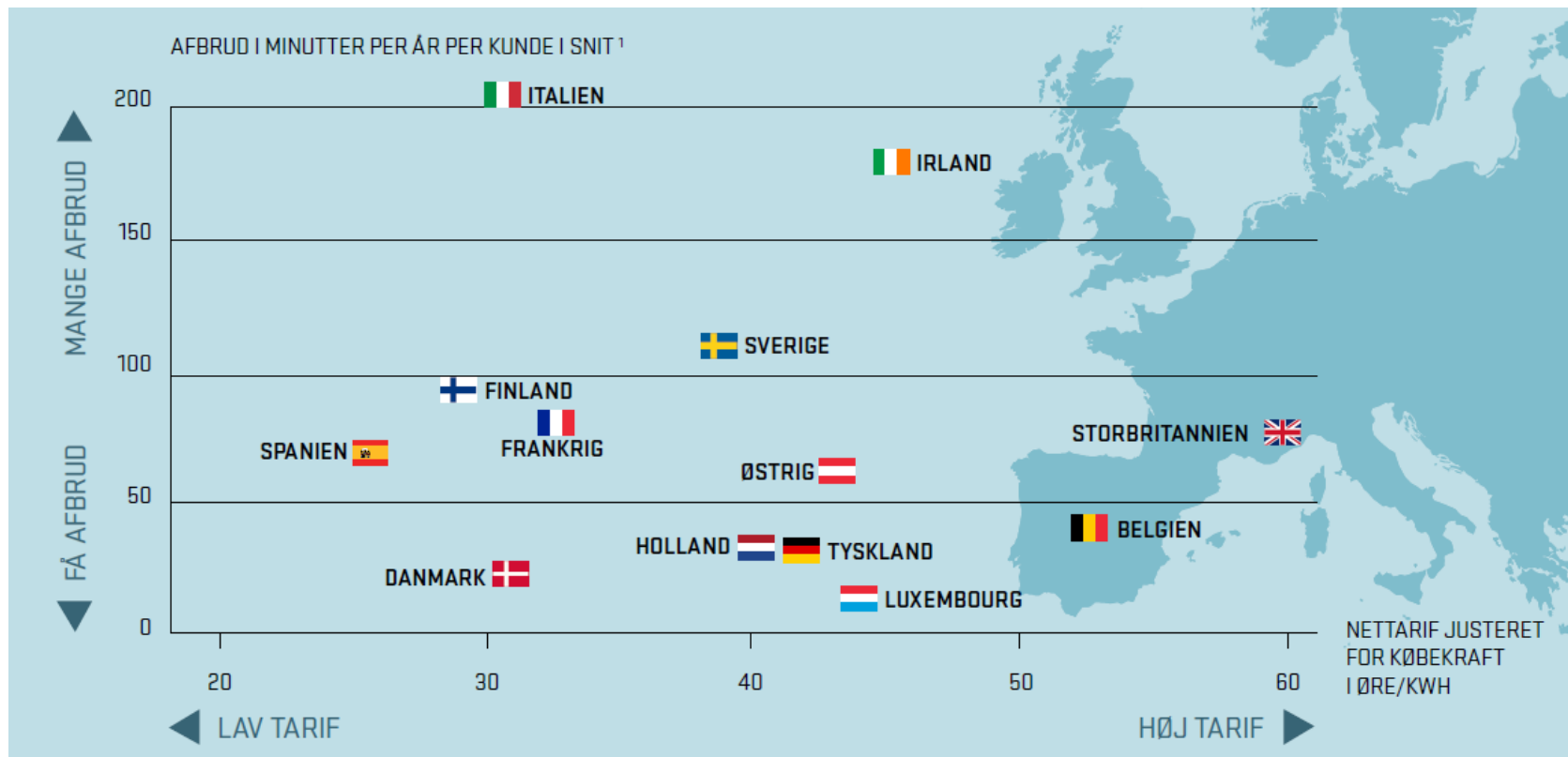
The Danish Intelligent Energy Alliance



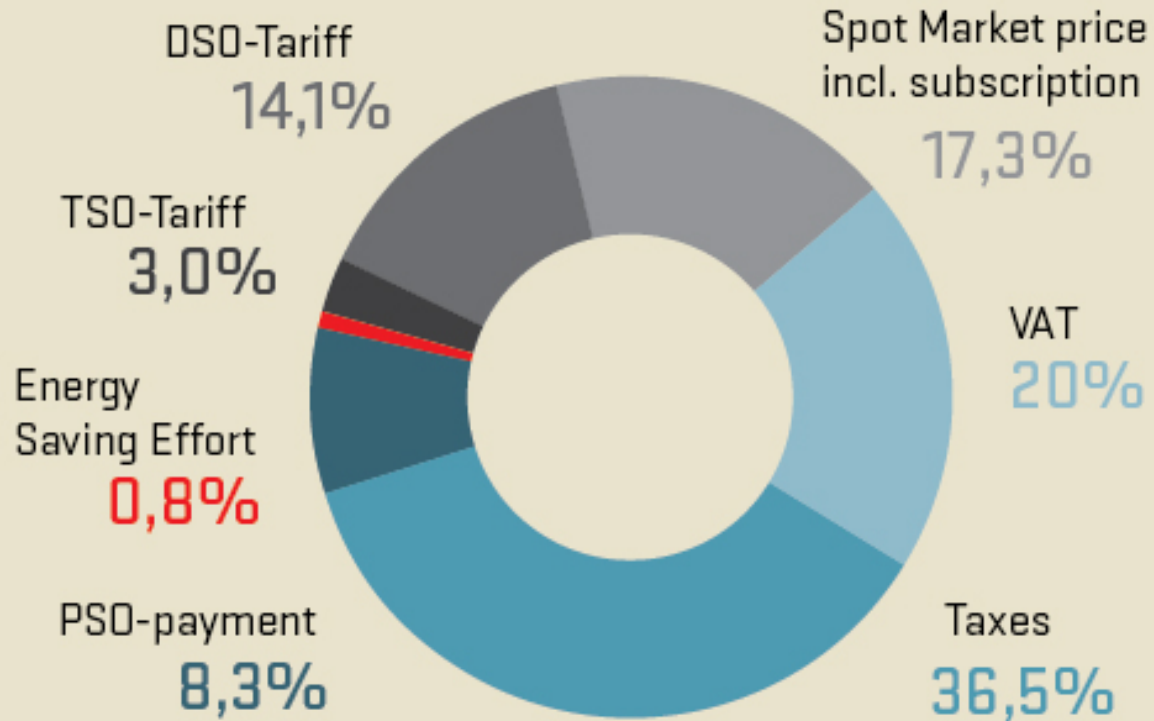
The Danish Pricing Model - Content

1. The current situation – towards 2020
2. Market framework and Buildings potential – Market Model 2.0.

Point of departure – very high security of supply

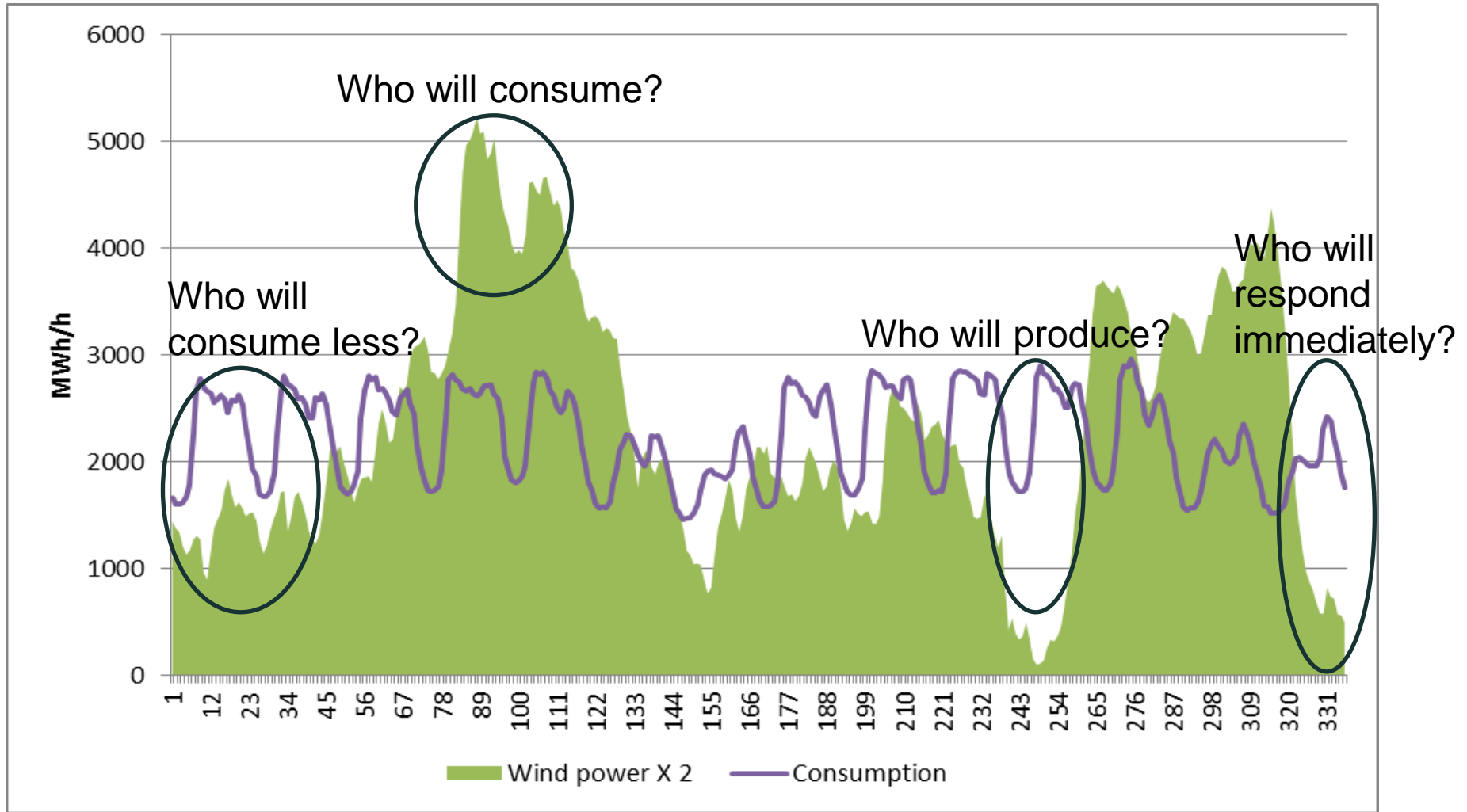


Household Electricity price, 2014



The future – The New Normal Situation

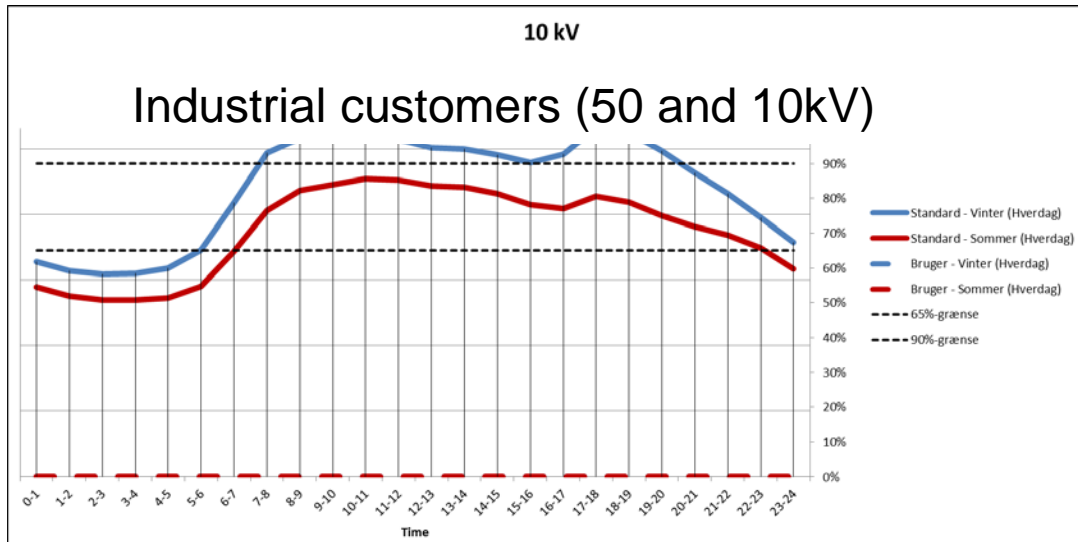
We believe buildings can play a major role on the responding side



New tariff model – vision/KPIs

- A model implemented by all Danish DSOs (harmonization) – April 2016
- Fit for the new market model in Denmark:
Two-bill to one-bill model (communication)
- Create a model with the right incentives for costumers in a future with increased electricity consumption (Demand Response)

National demand levels (24h overview)

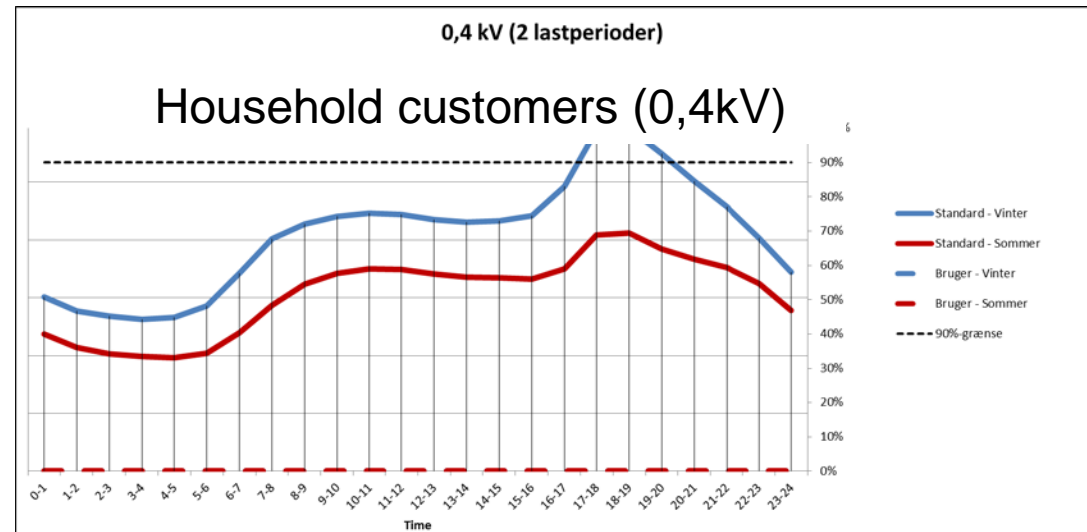


3 demand levels:

$$P_{\text{low}} < P_{\text{high}} < P_{\text{peak}}$$

2 demand levels

$$P_{\text{normal}} < P_{\text{peak}}$$



Demand level => “traffic light”

Industrial costumers:

Hverdage		
Time	Vinter	Sommer
0-1	●	●
1-2	●	●
2-3	●	●
3-4	●	●
4-5	●	●
5-6	●	●
6-7	●	●
7-8	●	●
8-9	●	●
9-10	●	●
10-11	●	●
11-12	●	●
12-13	●	●
13-14	●	●
14-15	●	●
15-16	●	●
16-17	●	●
17-18	●	●
18-19	●	●
19-20	●	●
20-21	●	●
21-22	●	●
22-23	●	●
23-24	●	●

Household customers:

Hverdage og weekend*		
Time	Vinter	Sommer
0-1	●	●
1-2	●	●
2-3	●	●
3-4	●	●
4-5	●	●
5-6	●	●
6-7	●	●
7-8	●	●
8-9	●	●
9-10	●	●
10-11	●	●
11-12	●	●
12-13	●	●
13-14	●	●
14-15	●	●
15-16	●	●
16-17	●	●
17-18	●	●
18-19	●	●
19-20	●	●
20-21	●	●
21-22	●	●
22-23	●	●
23-24	●	●

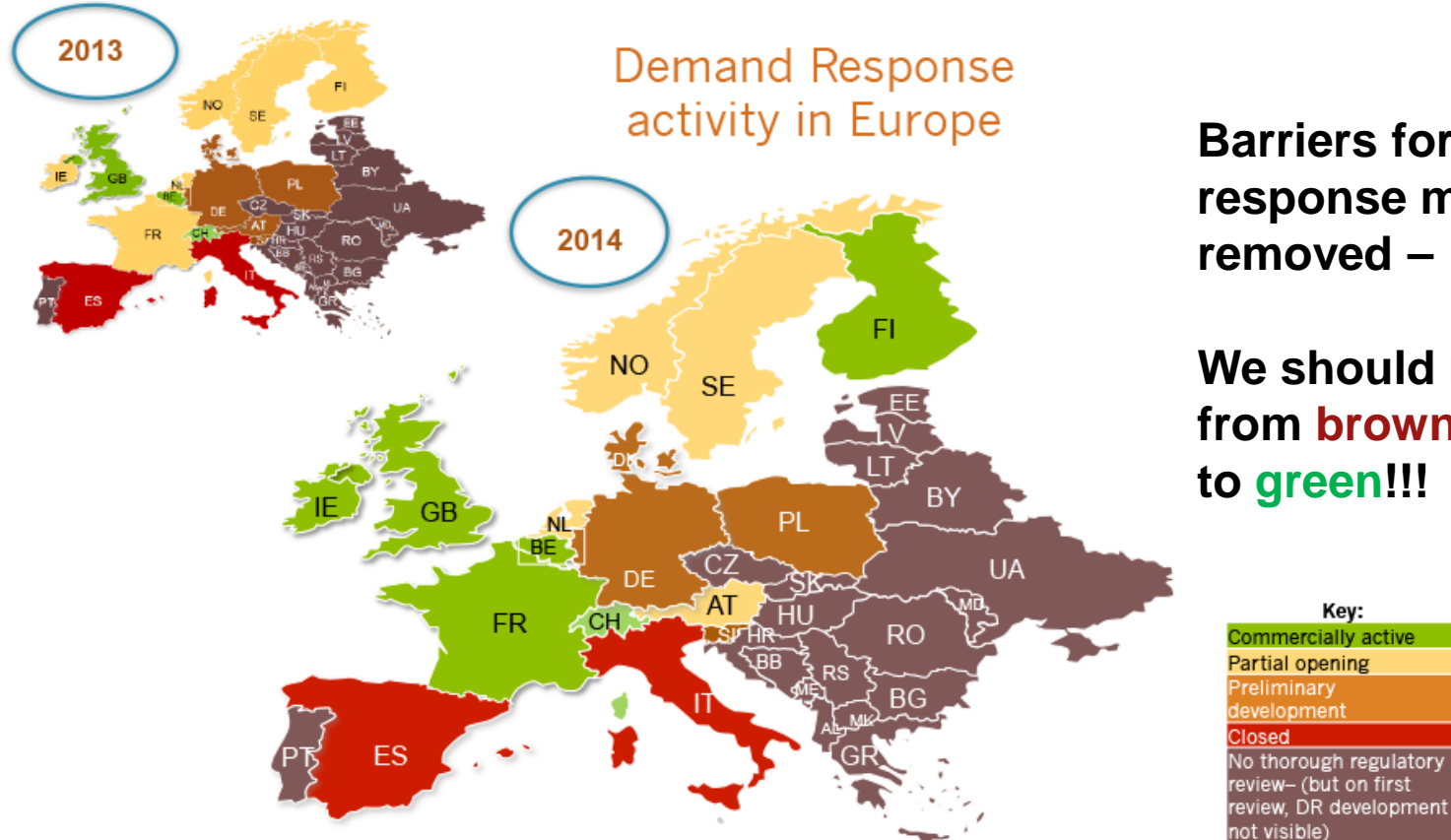
Phasing in Smart Meters and Hourly based payment – towards 2020

- "Engrosmodel" April 2016 – gradual transition to flexible payment measured by the hour it is consumed in
- Support from the centralised Datahub

Expected implementation of smart meters in Denmark						
2014	2015	2016	2017	2018	2019	2020
1.839.000	2.025.050	2.132.169	2.497.247	2.925.568	3.247.383	3.267.988

But the Electricity market must reward flexibility!!!

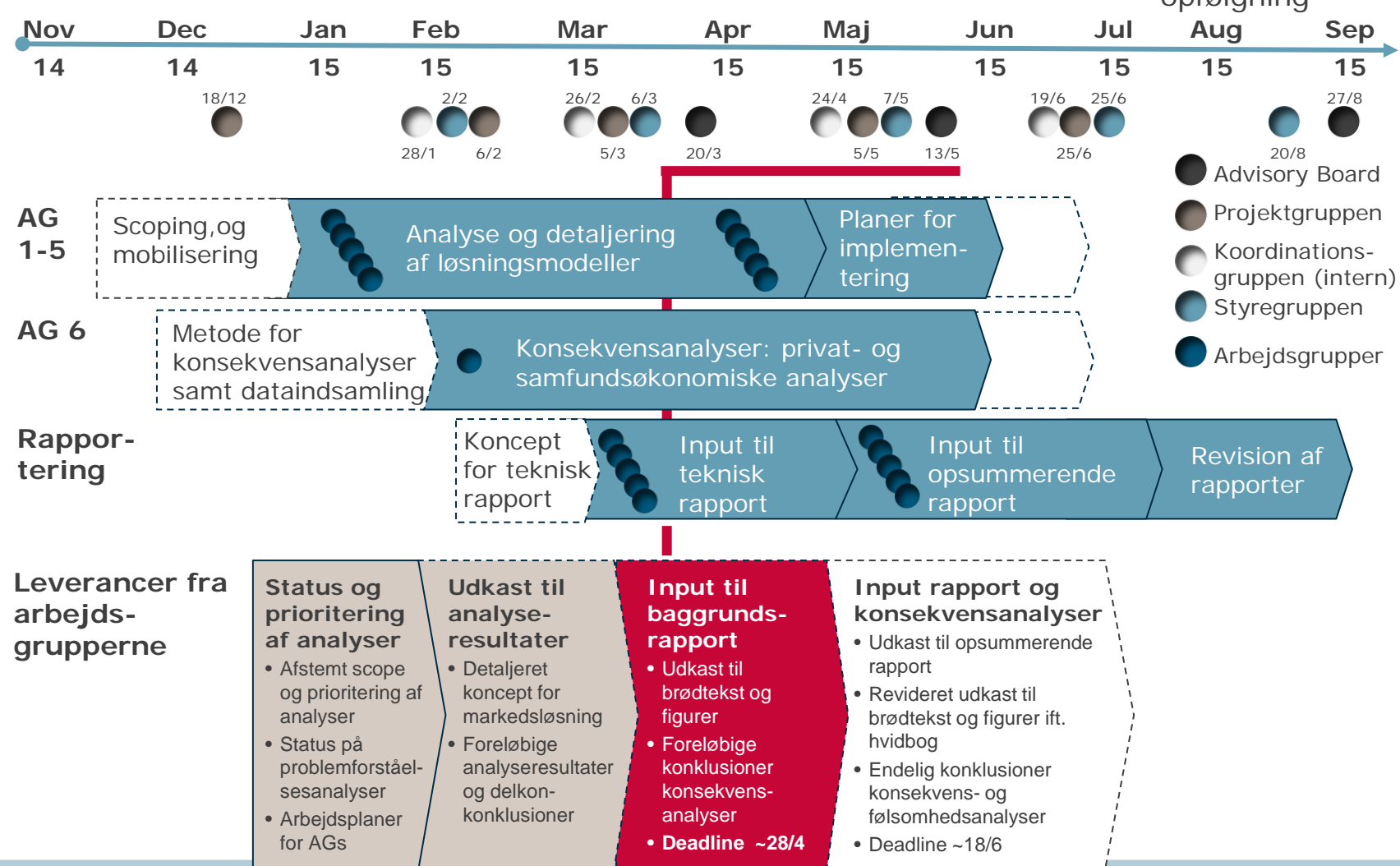
- The Danish TSO - Energinet.dk – has initiated a work called MARKET MODEL 2.0.



Source: Smart Energy Demand Coalition

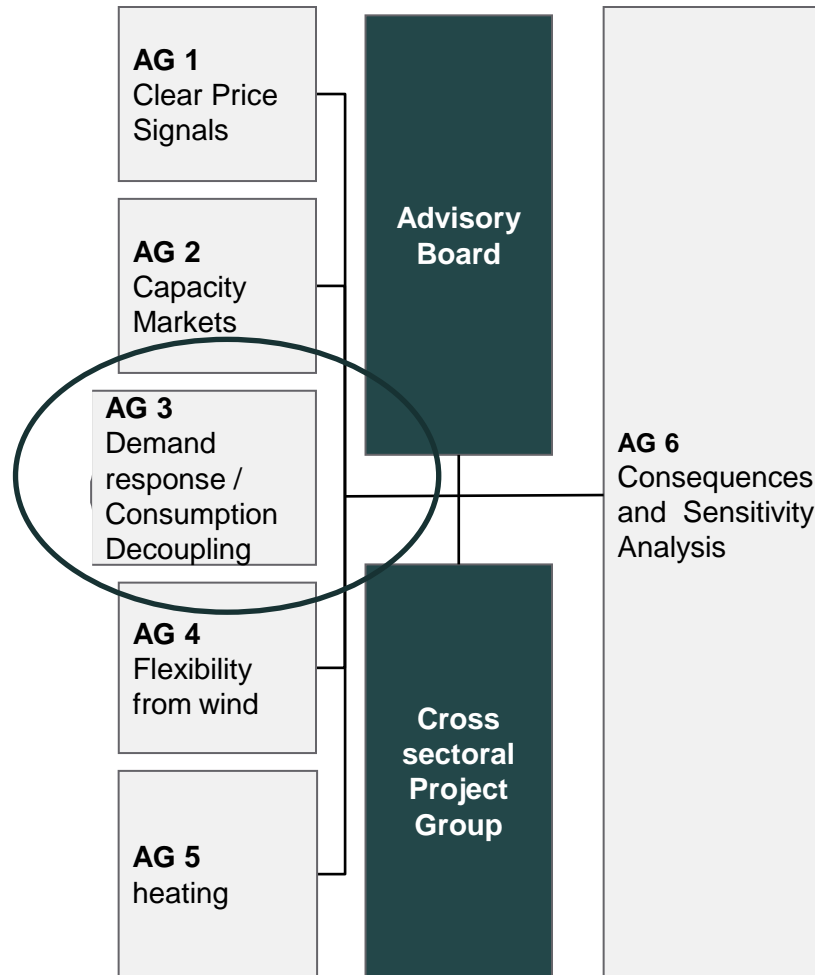
Market Model 2.0.

– More than DR - Focus on power shortages in a limited amount of hours per year

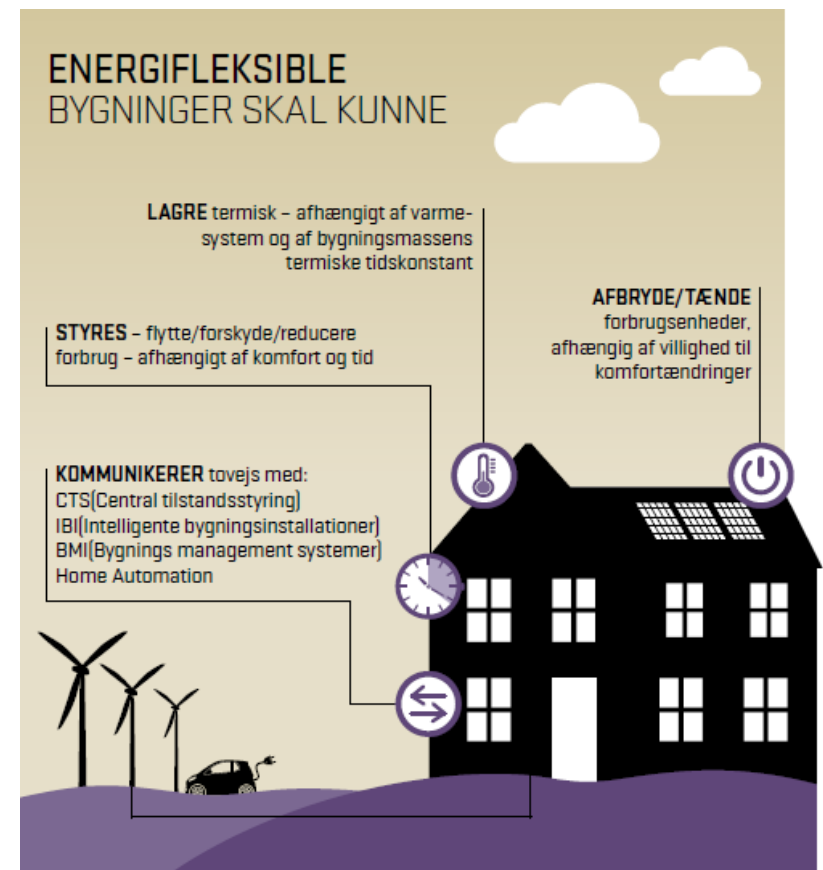


Market Model 2.0. – Multiple Working groups

– One about Demand Response / Consumption Decoupling



Buildings have a large demand response potential in the electricity market – AND it must be rewarded

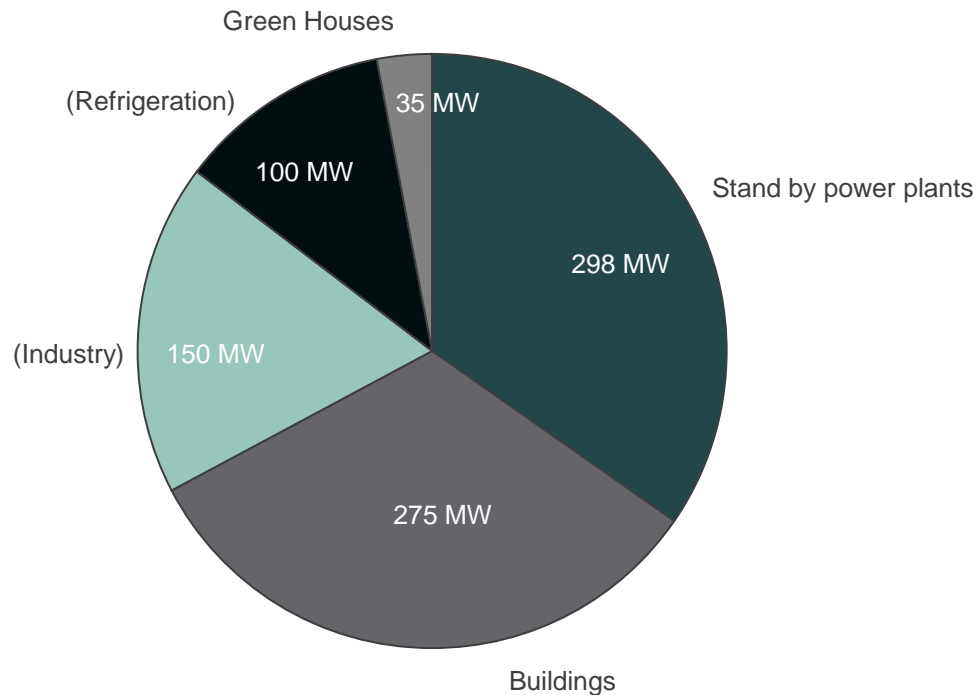


MARKET MODEL 2.0 – TECHNICAL POTENTIAL of DR

Focus on B2B – the first, conservative estimate was 840 MW

Fleksibel forbrugsafkobling pr. sektor (B2B)

MW *



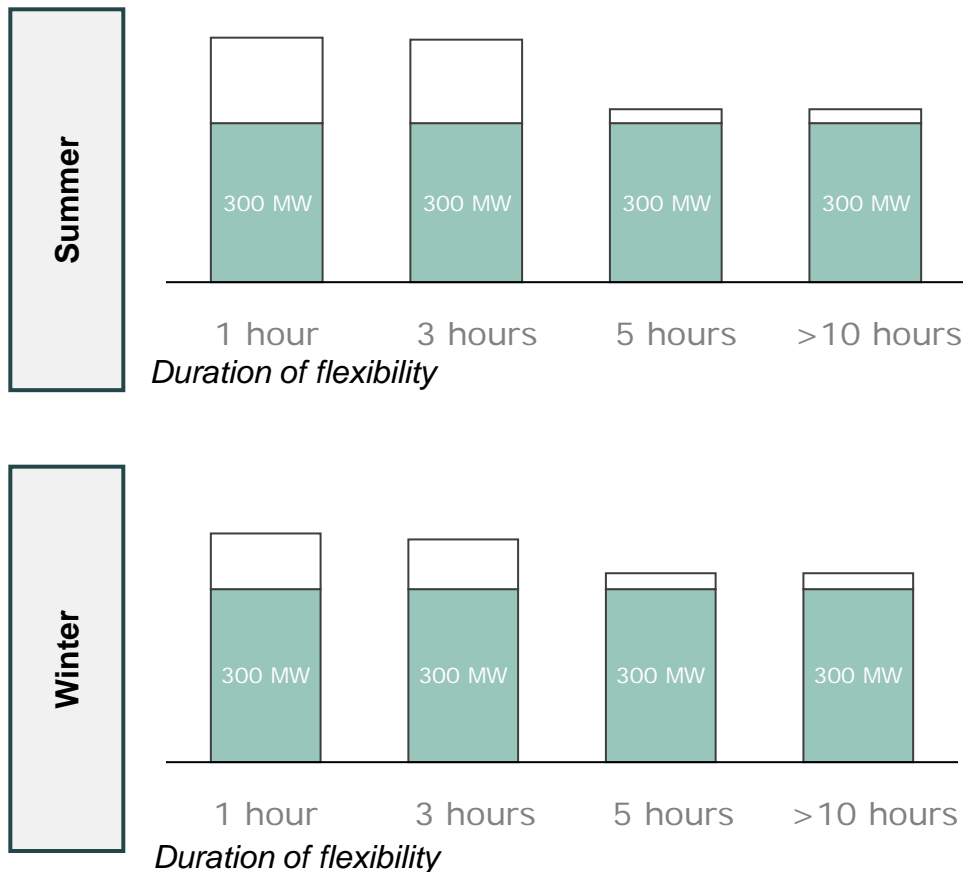
Kilde: ENDK, DE/iEnergi, DI m.fl.

An even more conservative estimate remains: the potential for flexibility is due to about 200-250 existing stand-by power plants

Potential for consumption decoupling

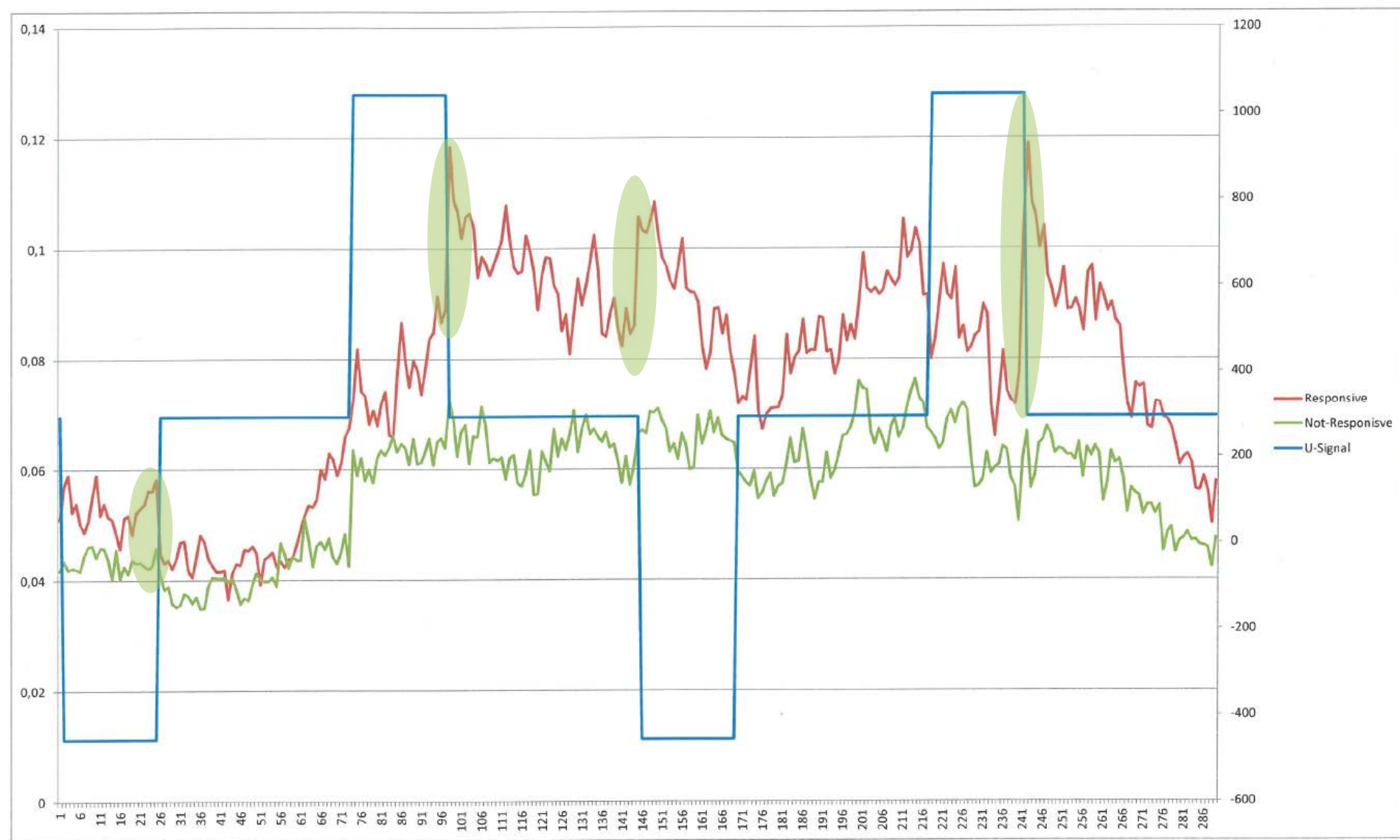
MW capacity with 10 hours of notification (all days between 07h – 20h)

- Additional potential from various sectors
- Stand-by power plants



- The geographical distribution of stand-by capacity is expected to be:
 - West-Denmark 100-150 MW
 - East-Denmark 150-200 MW
- The additional potential comes from buildings and power-intensive industry. According to ENDK the business case is in general not good, so the initial estimate has been reduced further to:
 - Buildings~130 MW
 - Power intensive industry~30 MW
 - New stand-by capacity

B2C potential is not included in Market Model 2.0
But it is there – see e.g. EcoGrids preliminary results :

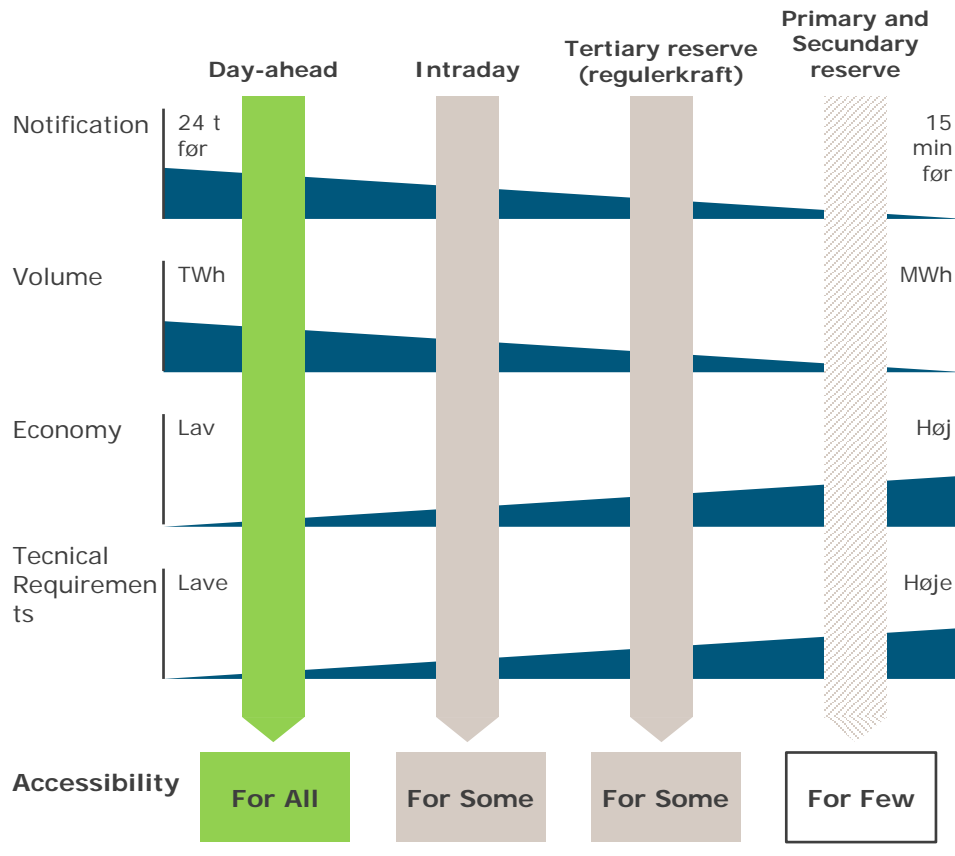


Assessment of barriers to Demand Response (1)

- **Lack of knowledge about the power market, e.g. owners of buildings, waste water sector, super markets etc.:**
 - Day-ahead and intra-day market - no regulatory barriers, but lack of knowledge and limited business case
- **Product design and Product conditions** for participation in the market:
 - Volume (required size of bids) must move from 10MW to 1MW (*Tertiary Market - Regulerkraft*)
 - Flexibility in terms of duration of power consumption decoupling/-flexibility (1-2 hours should be possible to offer) and flexibility in terms of duration of contractual commitment (from years to e.g. 6 months or one year) (*New capacity market and Secondary reserve market*)
 - Remove requirements about symmetry (*Primary reserve market*)
 - Validation of smaller units (from online measurements to statistical solution)

Barriers to Demand Response in various Power markets...

Potentiel Market for Demand Response



Assessment of barriers to Demand Response (2)

- **Lack of business case** (how to improve this – removal of barriers and support schemes / lower tariff of transmission ?! A new tariff model is introduced in 2016)
- **Dialogue required between aggregator and Balance Responsible Party (BRP)** (The rule is one BRP per meter)
 - EU analysis by Eurelectric and the EU Commission's Smart Grid Task Force exp.grp. 3 – points to "standard contract" as the solution
 - EU analysis by the Smart Energy Demand Coalition points to the necessity that aggregator and BRP do not communicate directly – e.g. UK independent unity surveys all demand response offered in the market
 - iEnergi's assessment indicates no need for standard contracts but further dialogue due to no agreement on what else is then needed

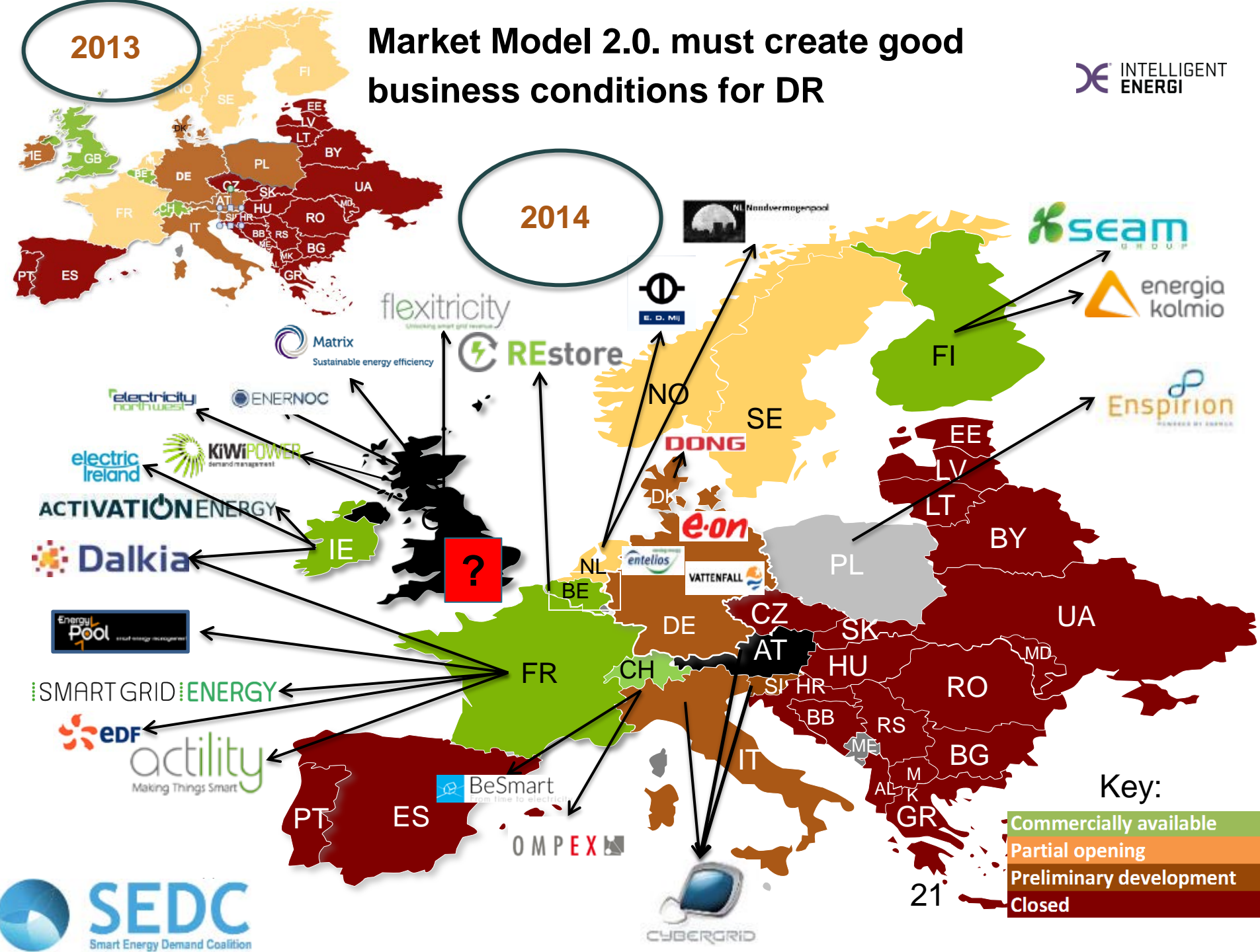
2013

Market Model 2.0. must create good business conditions for DR



INTELLIGENT
ENERGI

2014



Key:

- **Commercially available**

Partial opening

Preliminary development

Closed

24

SEDC
Smart Energy Demand Coalition

CYBERGRID



Thank you for your attention

Helle Juhler-Verdoner: HJV@danskenergi.dk or 35300456

