

A decorative graphic on the left side of the slide, consisting of a complex network of thin, light teal lines forming a series of interconnected triangles and polygons, resembling a wireframe or a stylized molecular structure.

# EU's VINTERPAKKE I ET FLEKSIBILITETSPERSPEKTIV

- Og lidt om Markedsmodel 2.0

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# AGENDA

1. Vinterpakken – fokus på fleksibilitet
2. Markedsmodel 2.0 → Markedsdesign for Aggregatorer
3. Energinet – Digitalisering – Innovation

# VINTERPAKKEN

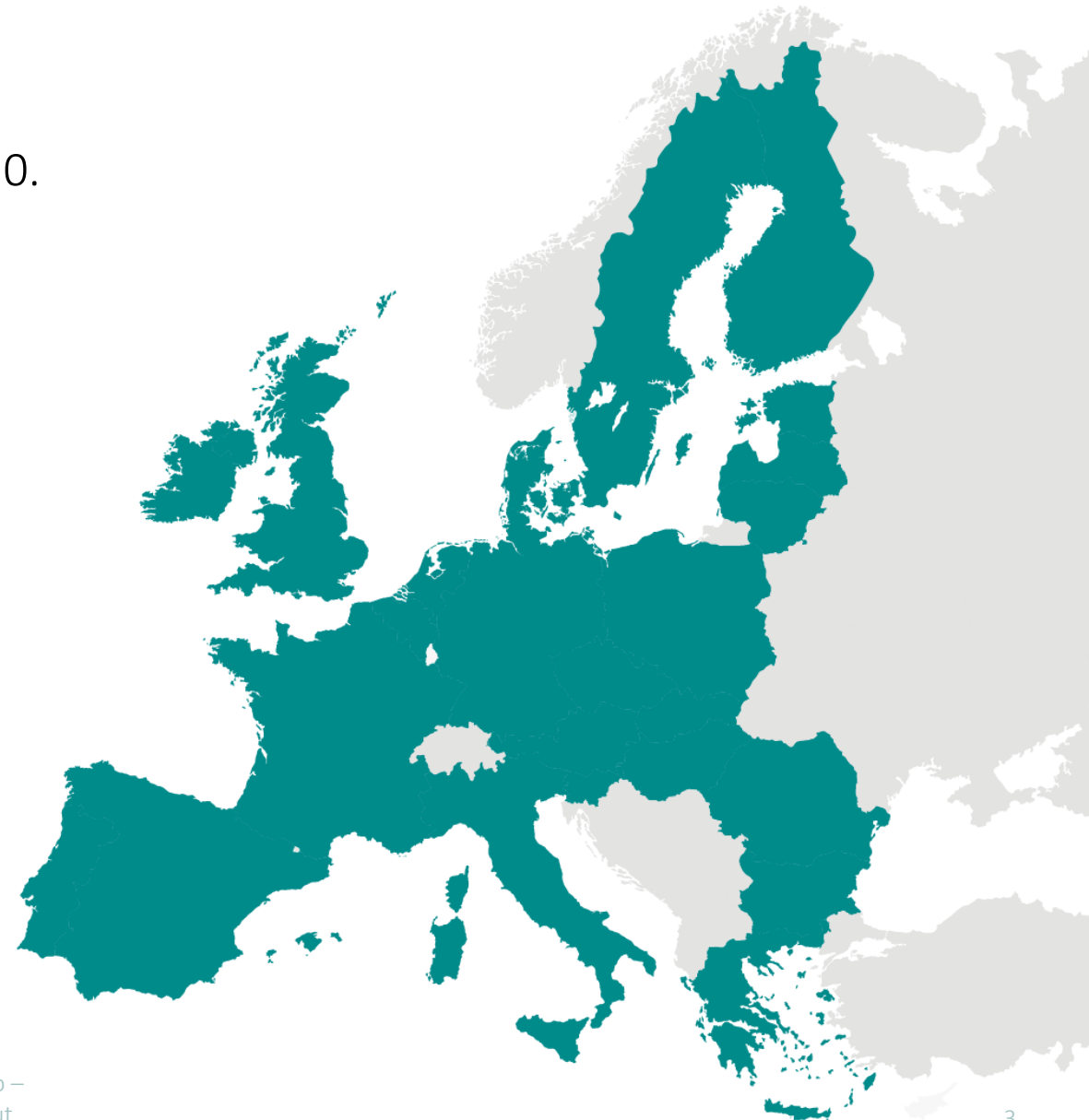
Lovgivningspakken foreslået af EU-Kommissionen den 30. november 2016

Interne forhandlinger i EU-Rådet og EU-Parlamentet er påbegyndt og forventes afsluttet i 2017

Forhandlinger mellem EU-Rådet og EU-Parlamentet forventes afsluttet i 2018

Som regel 2 års implementeringsfrist, så pakken finder anvendelse i 2020

Overordnet set er det meget gode forslag, som er i god overensstemmelse med MM 2.0



# DE FORSKELLIGE RETSAKTER

- Forordninger
  - Almengyldige og umiddelbart gældende
  - Network Codes og Guidelines vedtages som forordninger
  
- Direktiver
  - Bindende for medlemslandene – skal implementeres
  - El-direktivet implementeret gennem Elforsyningsloven
  - Gas-direktivet implementeret gennem NGFL
  
- Afgørelser
  - Bindende for dem, de er rettet mod



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# Demand Response and Dynamic Prices

April 2017



Impact assessment: Annex 3.1 (unlocking demand side response),  
Electricity Directive, Articles 11, 13, 15, 16, 17, 19, 20, 21

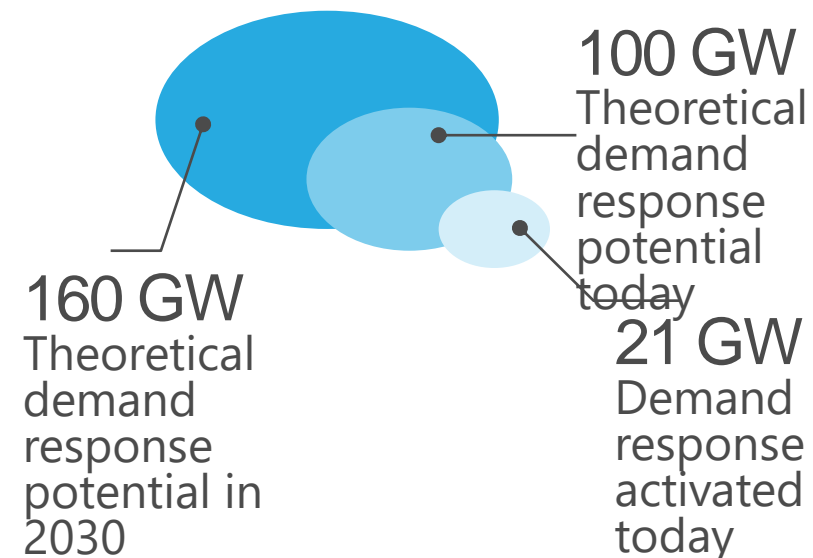
<https://ec.europa.eu/energy/en/news/commission-proposes-new-rules-consumer-centred-clean-energy-transition>

## Why is demand response needed?

Flexible generation requires flexible demand to reduce peak electricity prices and system costs

## There is a lot of untapped potential

- Only 21 GW activated today
- More than 50 GW can be activated by 2030
- 5.6 bn. euro/annum benefit
  - $\frac{3}{4}$  on the generation side
  - $\frac{1}{4}$  in reduced network investments



## Main challenges to activate demand response

### Two forms of demand response

**1) Price based (Implicit DR):** consumers are exposed to electricity price variations and actively adjust their demand.

*But:*

- Consumer must have access to a smart meter and a dynamic price contract

**2) Incentive based (Explicit DR):** consumers are paid for adjustments in their consumption

*But:*

- Market Barriers for demand service providers must be removed.

### Guiding principle

- Every consumer should have the option to get near real time information on his consumption
- Consumers should be able to actively manage their energy consumption on the basis of real time price signals, irrespective if roll out of smart meters (following a positive cost benefit analysis) is taking place
- Consumers must have the choice to participate in demand response or to remain on traditional average electricity price contracts

### Overcome existing m

- Smart meters full R
- 11 Member S
- Dynamic price cont

Motivationen: Forbruger skal kunne

- Opnå fordel på faldende engrospriser
- Justere forbrug ift. direkte profit i spotmarkedet
- Blive aktive i den grønne omstilling
- Deltage i forbrugsfleksibilitet uden krav om skift til ny elleverandør

put in





### Guiding principles for activating incentive based demand response

- Demand Response can compete with generation on a level playing field in all organised markets
- Create a level playing field for all market participants including demand service providers / aggregators
- Every market participant must be financially responsible for imbalances he causes to the system
- All market participants cover their own market and commercial risk resulting from more competition in the retail market

### Overcome existing market barriers

- Limited access of demand response to balancing and spot markets
- No market access for (independent) aggregators in some Member States without consent of established players (supplier)
- Legal requirements for aggregators to pay compensation to suppliers may render the business case negative



**Regulation: opening organised markets to demand response**

- **Art 5, Balancing markets**
  - non discrimination between generation and demand response
  - bids close to real time
- **Art 7, Intraday and Day ahead**
  - bids close to real time
  - trading in short time intervals (15 minutes)
  - small size (1 MW or smaller)
- **Art 11, dispatching**
  - Non discriminatory dispatching of demand response

## Balancing Responsibility of aggregators

- **Art 4.1 regulation, balancing responsibility:**
  - "All market participants shall ... be financially responsible for imbalances they cause to the system. They shall either be balance responsible parties or delegate their responsibility to a balancing responsible party..."
- **Art 2.14 directive, definitions**
  - "aggregator means a market participant..."
- **Art 17 directive, demand response**
  - "Aggregators shall not be required to pay compensation to suppliers or generators"
    - refers to purely commercial arrangements between market participants
  - "Member States may exceptionally allow compensation payments between aggregators and balancing responsible parties..."
    - Only refers to situations when aggregators delegated their balancing responsibility



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# DSO Flexibility and tasks

April 2017



## DSO use of flexibility

Electricity Directive: Articles 31, 32

- **Improve existing provisions** that require DSOs to consider demand response, energy efficiency and distributed generation in grid planning
- **Allow DSOs to procure services** (including non-ancillary) from distributed energy resources for managing local congestions and technical problems
- Procurement through **market based procedures**, with definition of required products and technical modalities → level playing field
- **Member States to define the exact regulatory framework** including incentives for DSOs and adequate remuneration



### AIM:

- ✓ Improve efficiencies in operation and development of network
- ✓ Avoid unnecessary grid expansions → lower grid costs and tariffs

## Distribution network tariffs

Electricity Regulation: Articles 16 and 55 - Electricity Directive: Article 59

- Existing regulatory framework for fixing/approving distribution tariffs or methodologies remains unchanged
- Additional principles for distribution network tariffs:
  - ✓ More explicit **transparency requirements** on regulatory authorities regarding tariff methodologies and underlying costs (Electricity Directive Art. 59.8)
  - ✓ **Non-discrimination** between generation connected to transmission and distribution (Art. 16.1 of Electricity Regulation)
  - ✓ Non-discrimination or disincentives against storage and demand response
  - ✓ **Cost-reflective tariffs** including the possibility of time-differentiated tariffs (Art. 16.7)
  - ✓ Regulatory authorities to provide **incentives to DSOs for use of flexibility and innovation** (Electricity Regulation Art. 16.8)

# VINTERPAKKEN

TSO-DSO samarbejdet bliver endnu vigtigere

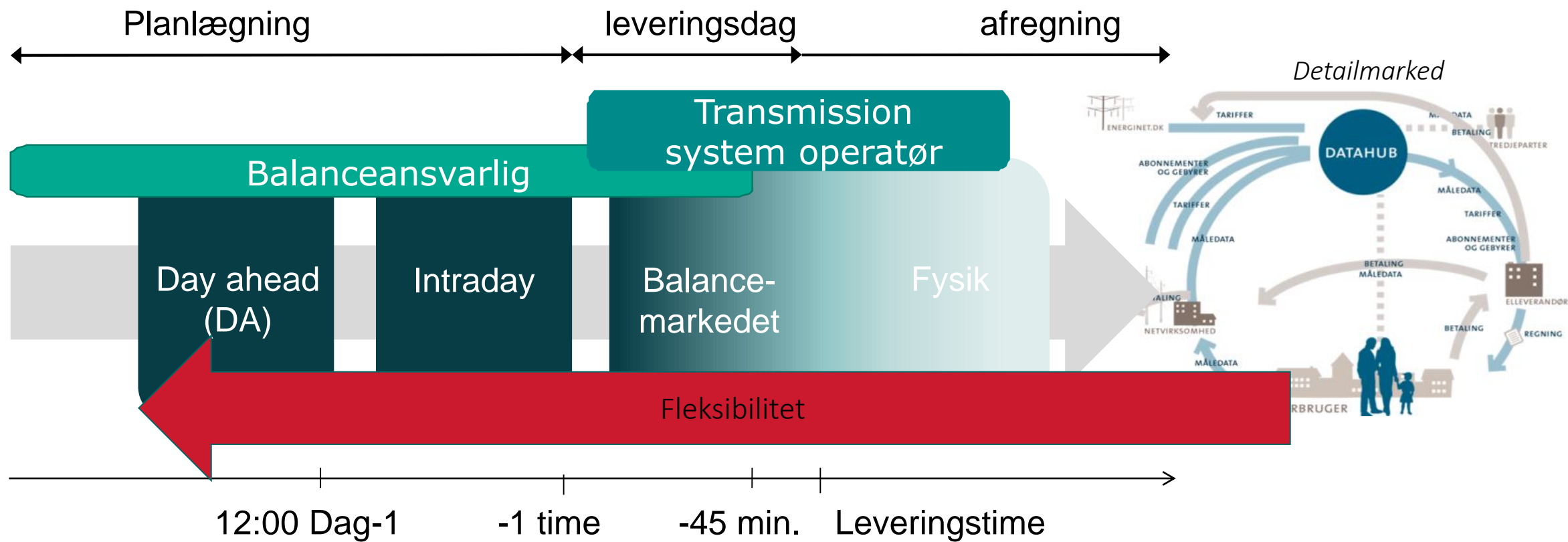


# MARKEDSMODEL 2.0 – MARKEDSDESIGN FOR AGGREGATORER



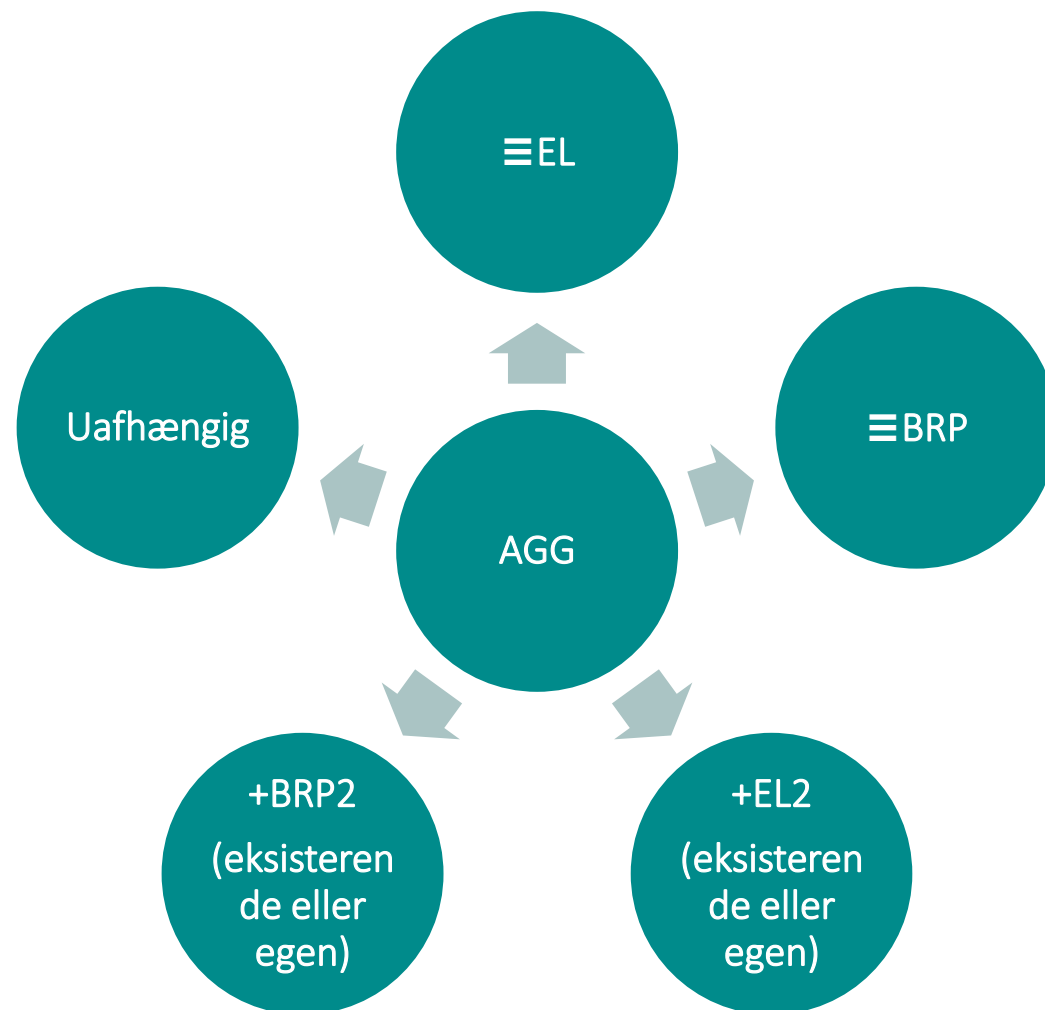
# ELMARKEDERNE & SLUTBRUGEREN

IMPLICIT EXPLICIT

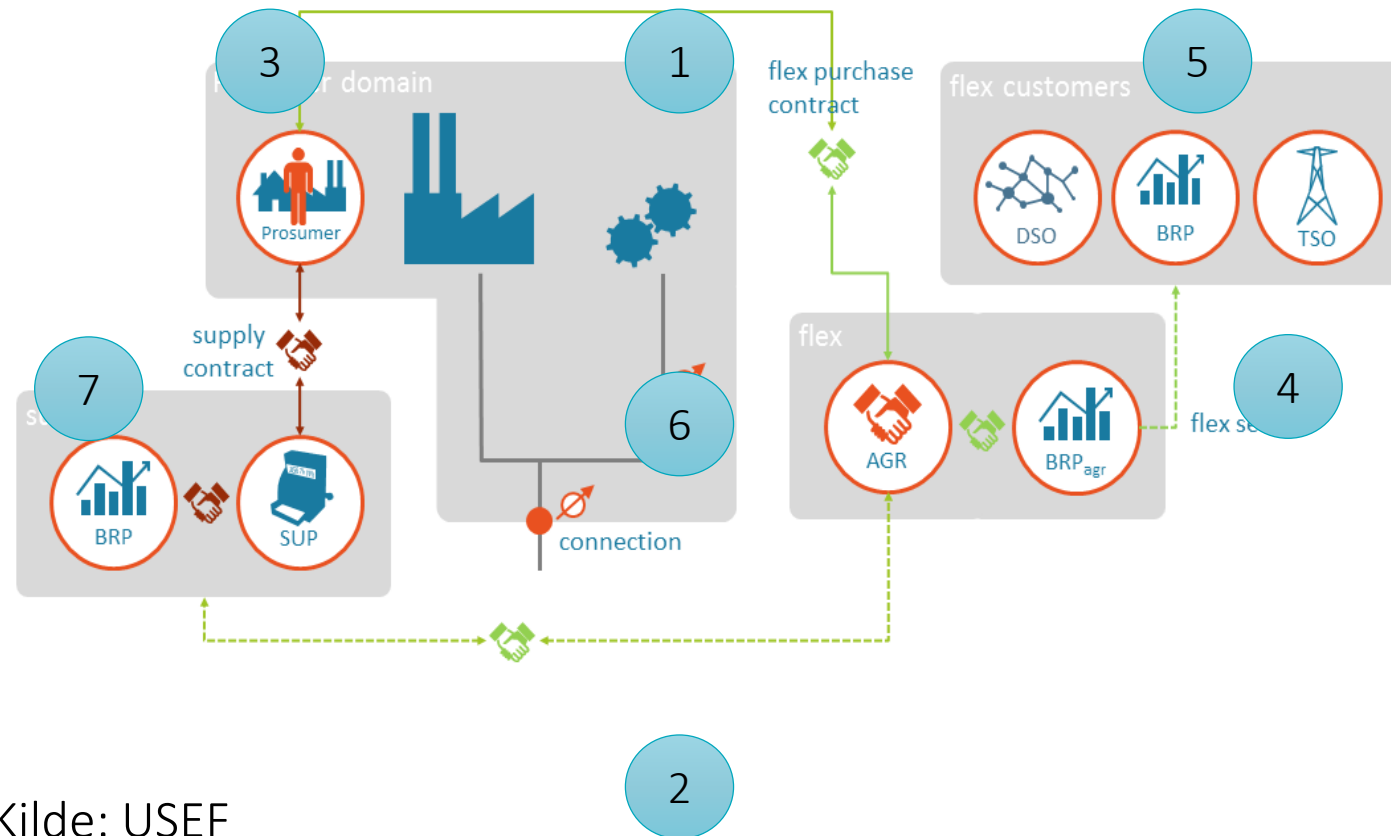


# MARKEDSMODEL 2.0

## – MARKEDSDESIGN FOR AGGREGATORER



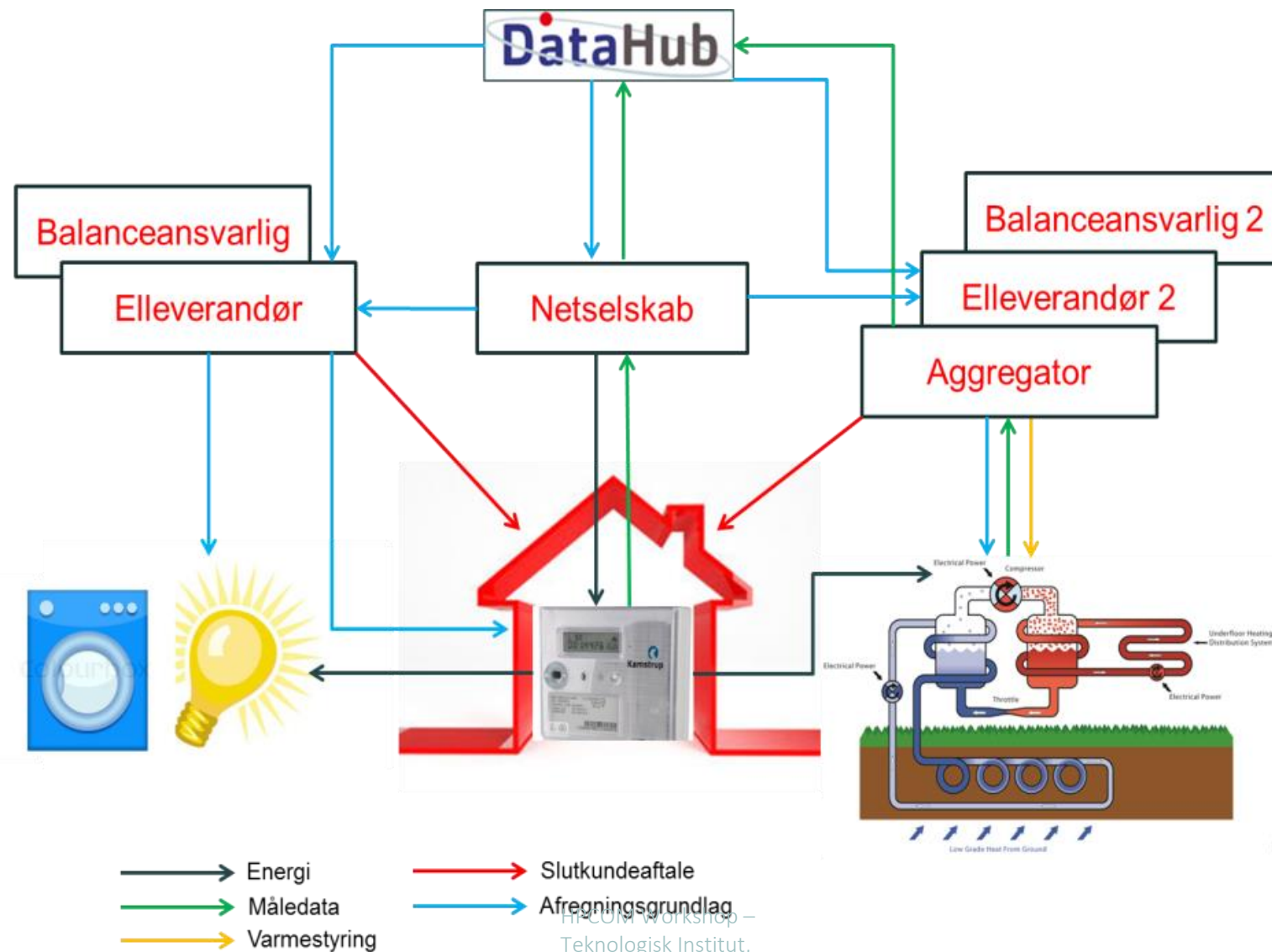
# THE SEVEN COMPLEXITIES OF AGGREGATING EXPLICIT DR



1. **Information exchange** and confidentiality - Finding a balance between transparency and confidentiality
2. **Transfer of energy** - How to neutralize the position of the Prosumer's supplier and its BRP
3. **Relationship between implicit and explicit DR** - How to separate both impacts unambiguously
4. **Baseline methodology** - Roles and responsibilities and appropriate baseline methodologies
5. **Portfolio conditions** - How to participate in TSO/DSO products through a portfolio?
6. **Measurement and validation** - Ensuring correct and trustworthy data
7. **Rebound effects** - Who is responsible for the possible impact after a DR event

Kilde: USEF

# VI SKAL VÆLGE ÉN MODEL, HVIS MULIGT...

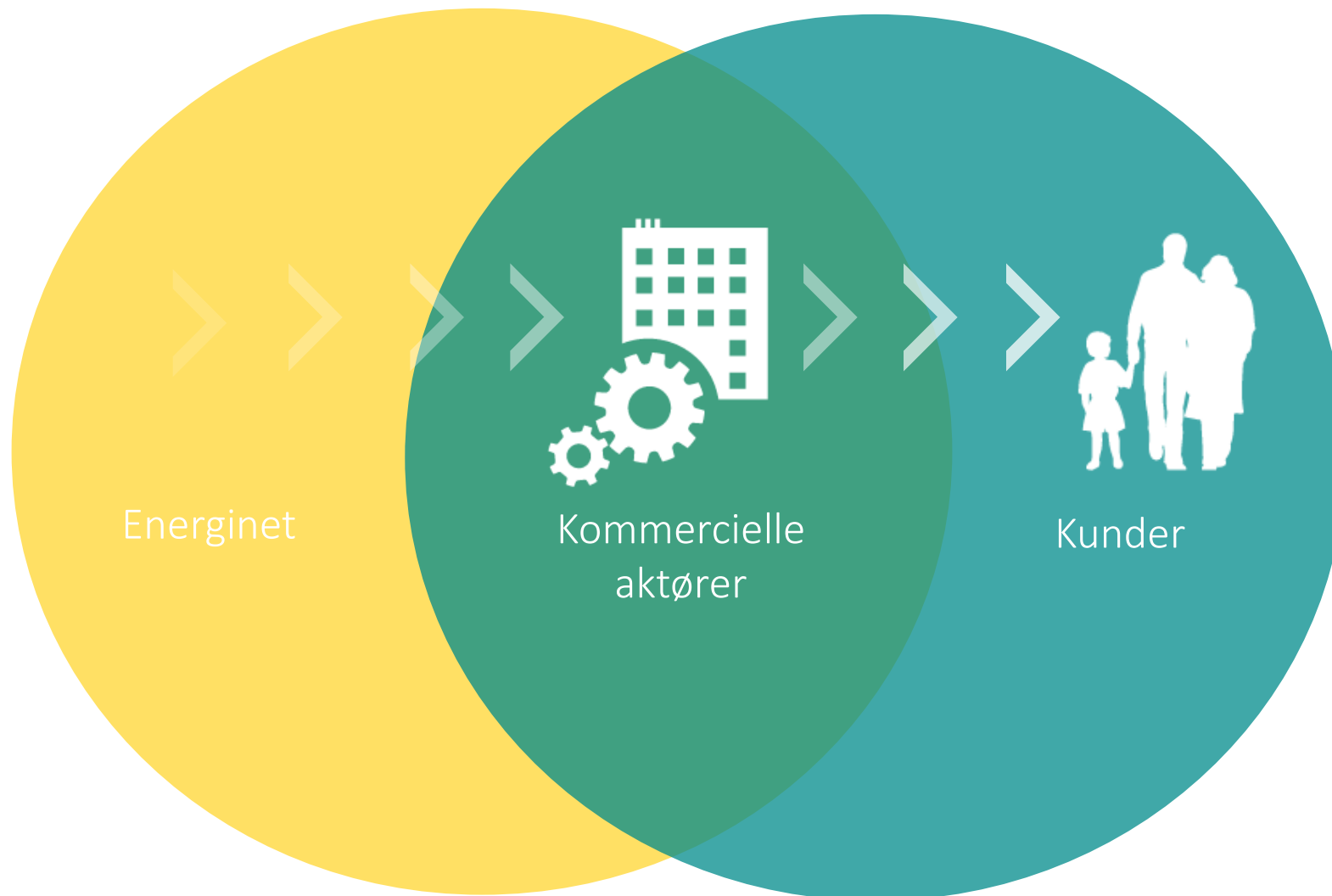


# ENERGINET – DIGITALISERING – INNOVATION

# Open Door Lab

Data skal bringes i anvendelse til understøttelse af *innovation og vækst samt bidrage til en effektiv grøn omstilling*





# HVAD ER OPEN DOOR LAB?



Et koncept for afprøvning af idéer og test af dataadgang til DataHub data med kommercielle aktører



Afholdes for små ressourcer som korte sprint hos Energinet.dk med adgang til nøglepersoner og systemer for DataHub data



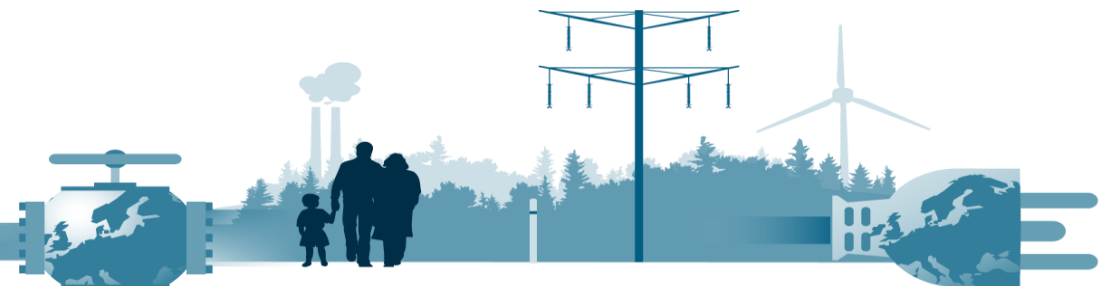
Ethvert sprint afsluttes med dokumentation af opnået viden til fri benyttelse for offentligheden



# ET OPEN DOOR LAB SPRINT KUNNE FX INDEHOLDE:

- Hashing (kodning) af forbrugsdata med henblik på offentliggørelse af forbrugsdata på mikroniveau (på sigt kan de lægges i Energidatabank)
- Et forsøg mellem Energinet og en kommerciel analysevirksomhed om tilknytning af lærende algoritmer til DataHub-data
- Et forsøg mellem Energinets kontrolcenter og et DSO-kontrolcenter om prognoser baseret på DataHub data

# PILOT PROJECTS



# PILOT PROJECT FOR EMERGING TECHNOLOGIES IN THE ANCILLARY SERVICES MARKETS

## Background:

- "New technologies" doesn't fit the current rules for market participation
- This is a barrier for market participation and leads to a reduced supply and competition
- This is a part of Energinet.dk strategy

**Purpose:** Test market and technical rules adaptations prior to permanent adoption

**Timeline:** Pilot tests expected to last until 2017. There will be an evaluation and discussion prior to a change in market and technical rules

"New technologies": Batteries, wind turbines, photovoltaic, electrical vehicles, heat pumps etc.



# PILOT PROJECT FOR EMERGING TECHNOLOGIES IN THE ANCILLARY SERVICES MARKETS

**Participants:** 4 pilot projects have been chosen.

**Technologies:** Battery, electrical vehicles, service industries and heat pumps.

**Project framework cover various barriers:** online measurement, verification and 3<sup>rd</sup> party aggregators.

## Framework:

In-kind collaboration – Each party carries own costs.

The value for the participant is market access on temporarily relaxed conditions.

Eventual revenue shall be obtained in existing markets.

The participants gets a first-mover experience with the future market rules, and get the possibility to affect these based on own experiences in the market.



# DTU/NUVVE: PARKER PROJEKTET

The purpose of the project is to demonstrate the delivery of FCR-N from a pool of EV's

Setup:

- 10 Nissan Leaf EV's at Frederiksberg Forsyning (100 kW battery capacity)
- 10 Enel chargers
- Nuvve delivers the software for aggregation
- NEAS is the balance responsible party

Energinet's first learning's:

- To reach minimum bid size: aggregate EV's with other consumption
- One DSO meter at the parking lot for all cars
- Meter at the EV is used for verification
- No online measurement for delivering FCR
- Calculation of taxes and fees (consumption and production)

Goal:

- Expand the project to 40 EV's in 2017



# ENERGYCOOL AND ECONGRID

The purpose of the project is to demonstrate the delivery of regulating power from a pool of batteries from telesites, including the calculation of baselines.

Setup:

- 4 telesites (approx. 300 kW battery capacity)

Energinet's first learning's:

- Definition and calculation of baseline
- Establishment of one meter per telesite
- Test of actual delivery of mFRR

Goal:

To expand the project to 100 telesites in 2017



# INSERO AND NEOGRID

The purpose of the project is to demonstrate the delivery of regulating power from a pool of heat pumps, including the delivery of consumption data from a submeter into the DataHub, with the purpose of billing.

Setup:

- 9 heat pumps located at public institutions (approx. 300 kW)
- The project is also part of EcoGrid 2.0 project

Energinet's first learning's:

- No official test has been made yet

Goal:

- Delivering service and flexibility as an aggregator to the heat pump customer.



# ENERGIDANMARK

The purpose of the project is to demonstrate the effects of delivering demand response from service industries to the ancillary services market.



Setup:

- 4 participants: A shopping mall, a cooling company, a wastewater treatment plant and a nursery
- KiwiPower delivers the software for aggregation



Energinet's first learning's:

- No official test has been made yet

Goal:

- To deliver flexibility from customers and expand the concept to the other Nordic countries





# SPØRGSMÅL



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