



## WP2: Framework conditions

**Skytte, Klaus**

*Publication date:*  
2016

[Link back to DTU Orbit](#)

*Citation (APA):*  
Skytte, K. (Author). (2016). WP2: Framework conditions. Sound/Visual production (digital)

---

### General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.



**Flex4RES**

Flexible Nordic Energy Systems



# Flex4RES

## WP2: Framework conditions

Flex4RES workshop, NMBU, ÅS, Norway  
30 August 2016

project coordinator:

**Klaus Skytte**

[Klsk@dtu.dk](mailto:Klsk@dtu.dk)

Energy Economics and Regulation  
DTU Management Engineering , Denmark



Nordic Energy Research

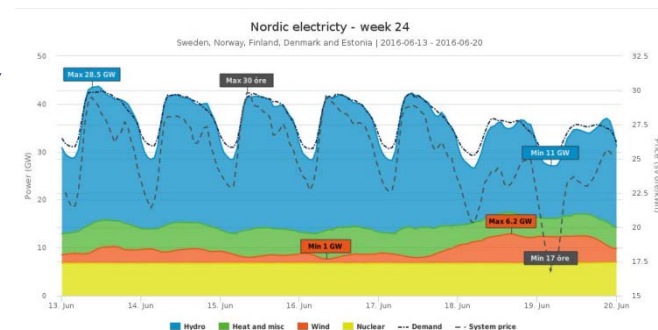
## Why are the potentials not used?

- a) **Identify regulatory and technological barriers/drivers** within different sectors
  - 1) Heating
  - 2) Electricity (and transmission)
  - 3) Transportation
  - 4) Gas
  
- b) **Develop coherent regulatory frameworks and market designs** that facilitate energy market couplings that are optimal for the Nordic conditions in an EU context.



# Key findings - so far

- Differences in tax and tariff structures
  - Electricity taxed on the consumption side
    - no taxes on fuels in order to increase competition
  - Other sectors taxed on the fuel use + tax exemption for biomass use
  - Different levels in the different countries
- The Nordic power market is well functioning despite a few technical challenges.
  - Designed to balance variations in demand (load profiles) and hydro power - **energy flexibility**
  - More VRE require - **power flexibility**





## District heating – key findings:

Flexible resources – esp. with heat storage

- CHP - act to high power prices
- P2H - act to low power prices

No direct policies for flexibility in the DH system

- Mainly provided by market incentives

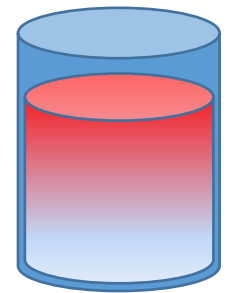
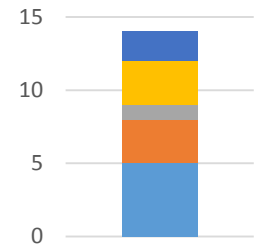
Investment and re-investment in CHP and P2H impeded by lack of incentives

- Operational income (not enough price variation), investment subsidies and operation subsidies

# District heating – key barriers:



- CHP: Baltics: Lack of exposure to electricity markets
- P2H: Electricity taxes and tariffs increase cost of electricity consumption
  - Poor competitiveness of P2H against other heat-sources, e.g. biomass boilers
- General resources: Operational practice of heat production following heat demand
  - Load-following by heat production units rather than utilisation of heat storage is a barrier for flexible operation



# Key results from the electricity survey



Flex4RES

## Drivers for flexibility...

- ✓ Equal & open access to the power markets
- ✓ Supportive policy including low risk for TSO and DSO investment in domestic and transnational grid capacity
- ✓ Supportive policy for demand-side activation. E.g. smart grids

## Price signal is lacking to activate flexibility potentials

- Low price level cause no incentives to invest in flexible capacity
- Not sufficient incentives for the consumption side to act flexible + high tariffs
- Lack of market based RES support scheme



# Next steps

- ✓ District heating
- (✓) Electricity
  
- Transport sector
- Gas





Thank you for your interest



Flex4RES

Questions ?



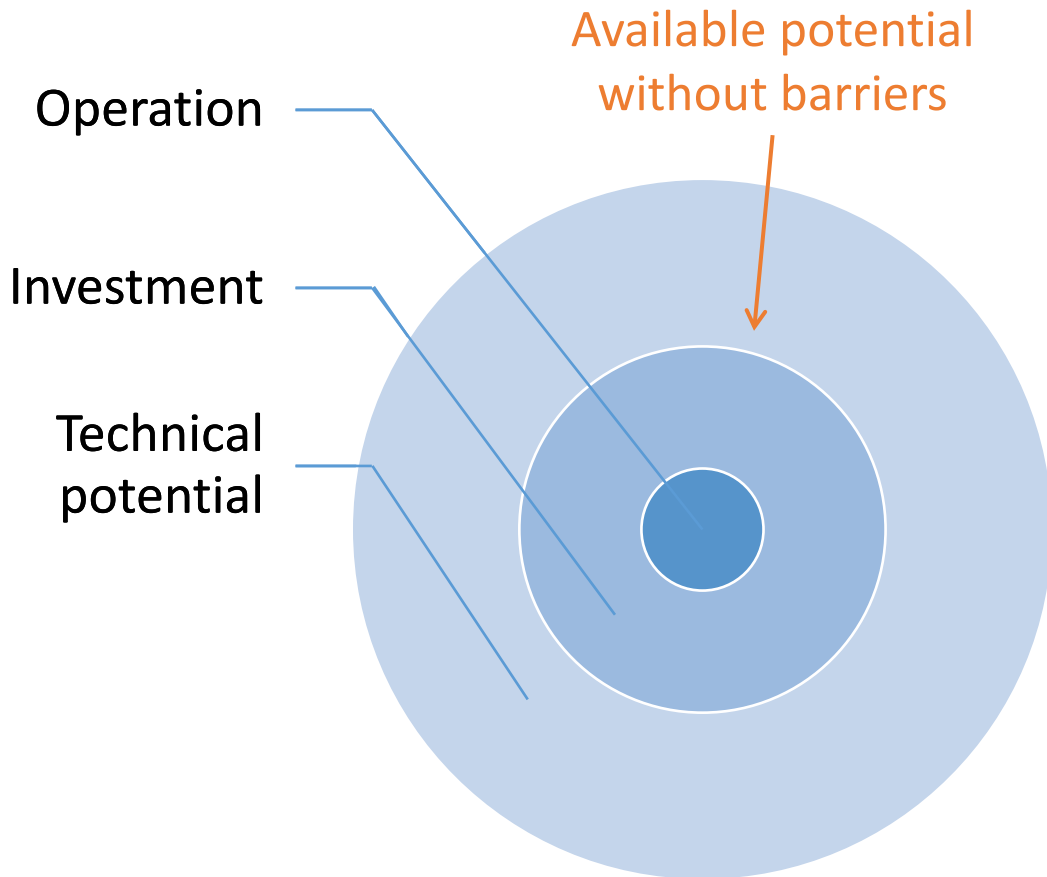
**Klaus Skytte**  
Head of Energy Economics and Regulation  
System Analysis Division  
DTU Management Engineering  
Technical University of Denmark

[klsk@dtu.dk](mailto:klsk@dtu.dk),  
<http://www.sys.man.dtu.dk/>



[www.Flex4RES.org](http://www.Flex4RES.org)

# Regulatory barriers and drivers



Framework category:  
Political/jurisdictional, financial, market control, behavioural/organizational.

Political level: EU, national, local

Effect on flexibility: Driver or barrier for investment and operation.

Incentive: Direct or indirect, strong or weak incentives