

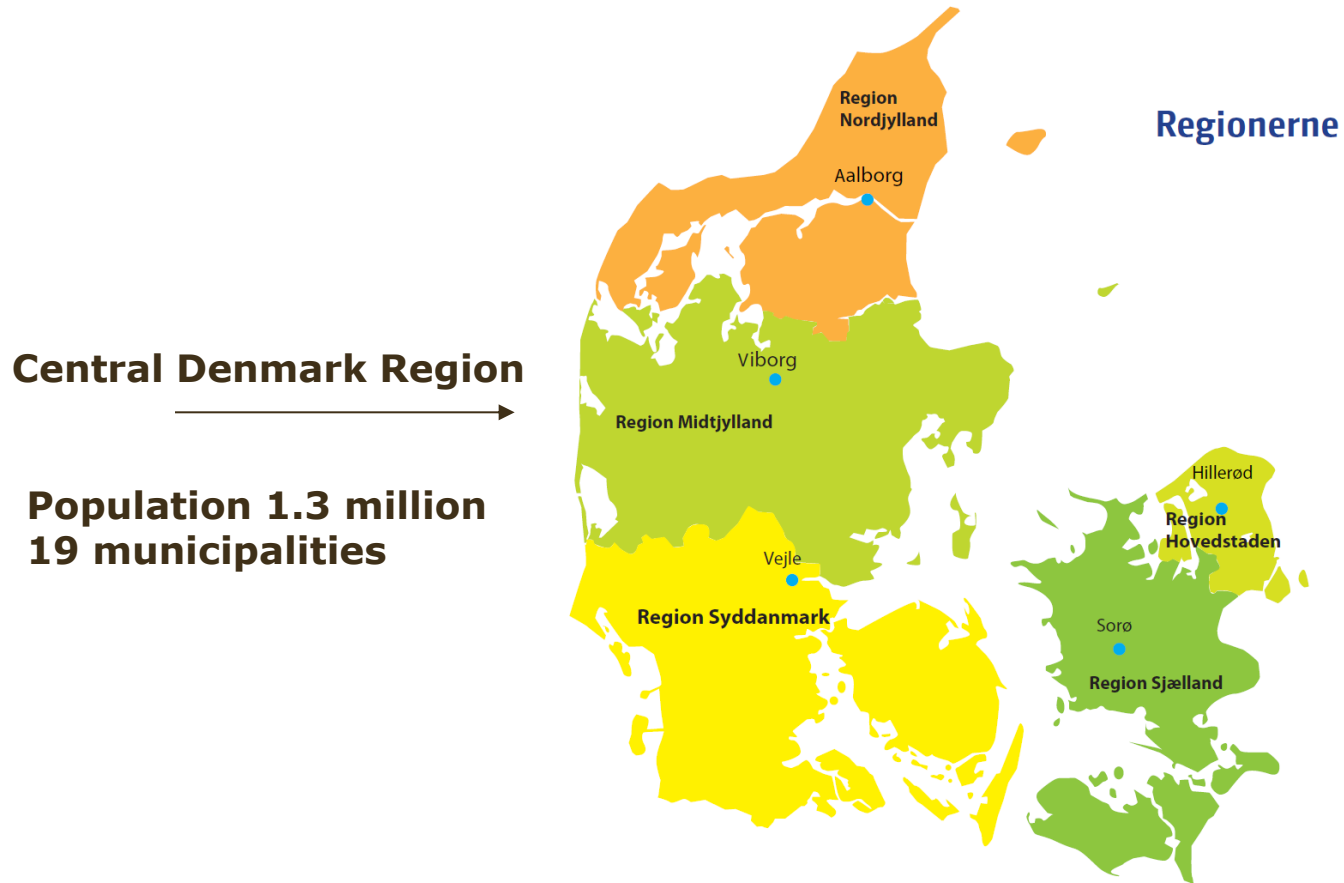


District heating in regional and local Energy Planning

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The Danish regions



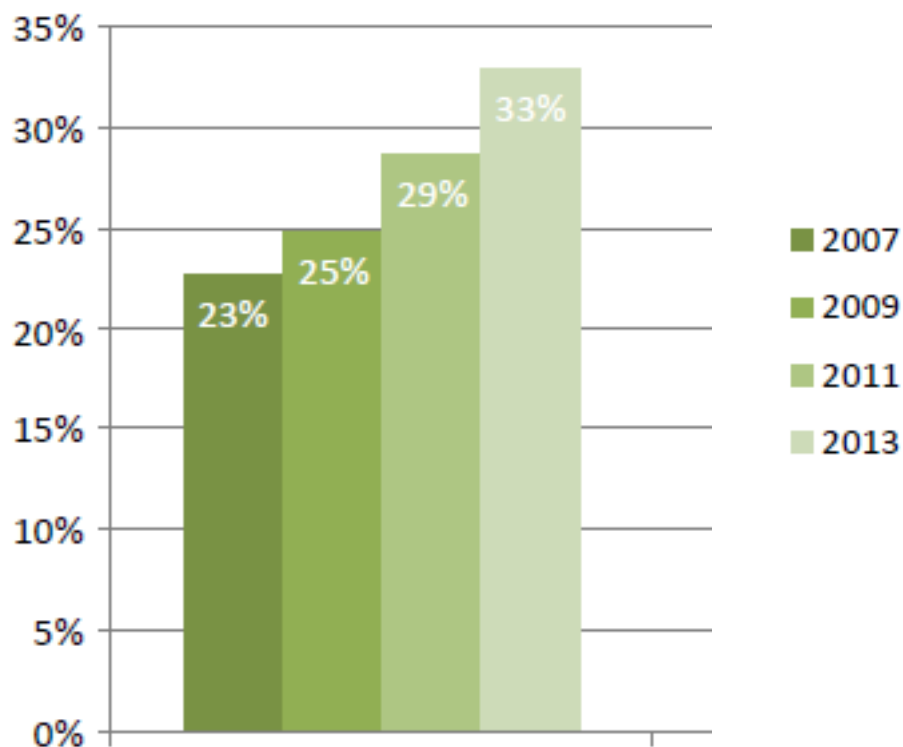
Goals for renewable energy in CDR

Year 2025: 50 % renewable energy

Year 2050: 100 % renewable energy



Amount of renewable energy in CDR

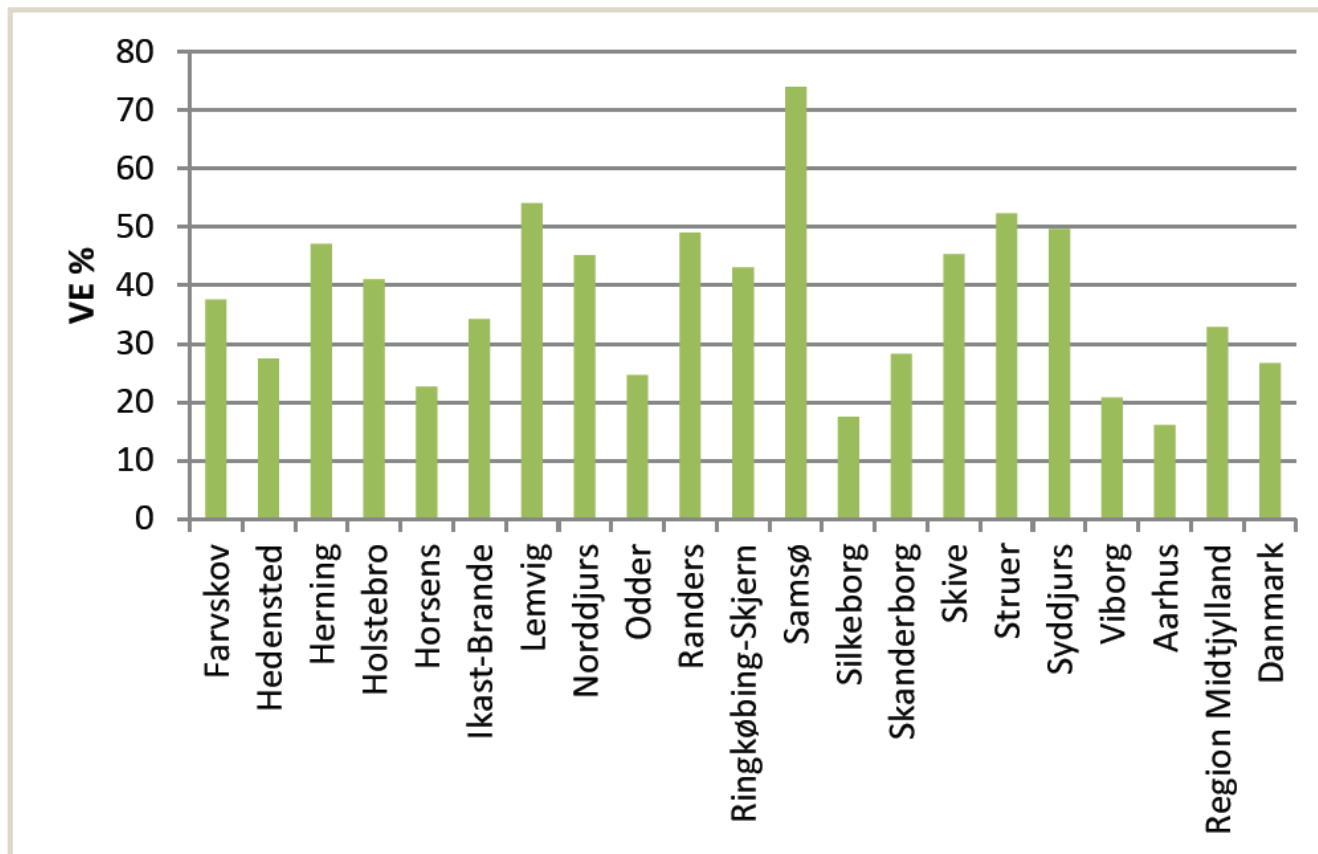


2013

Danish average = 27%

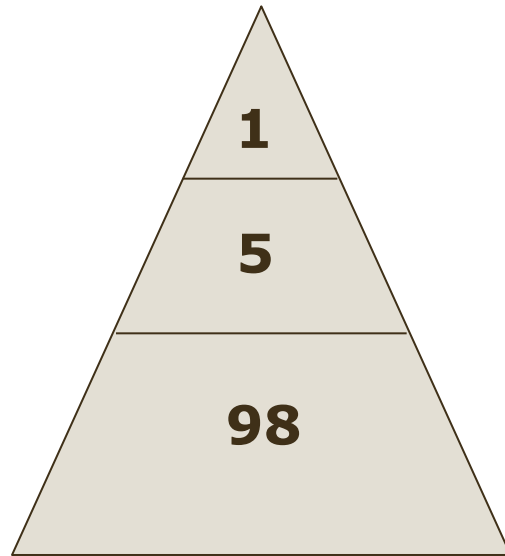
EU average = 15%

Renewable energy in the 19 municipalities



Share of renewable energy for the 19 municipalities situated in Central Denmark Region [%]

The energy authorities in Denmark



The state of Denmark:

Legislation, laws, energy taxation

The regions: No formal authority!

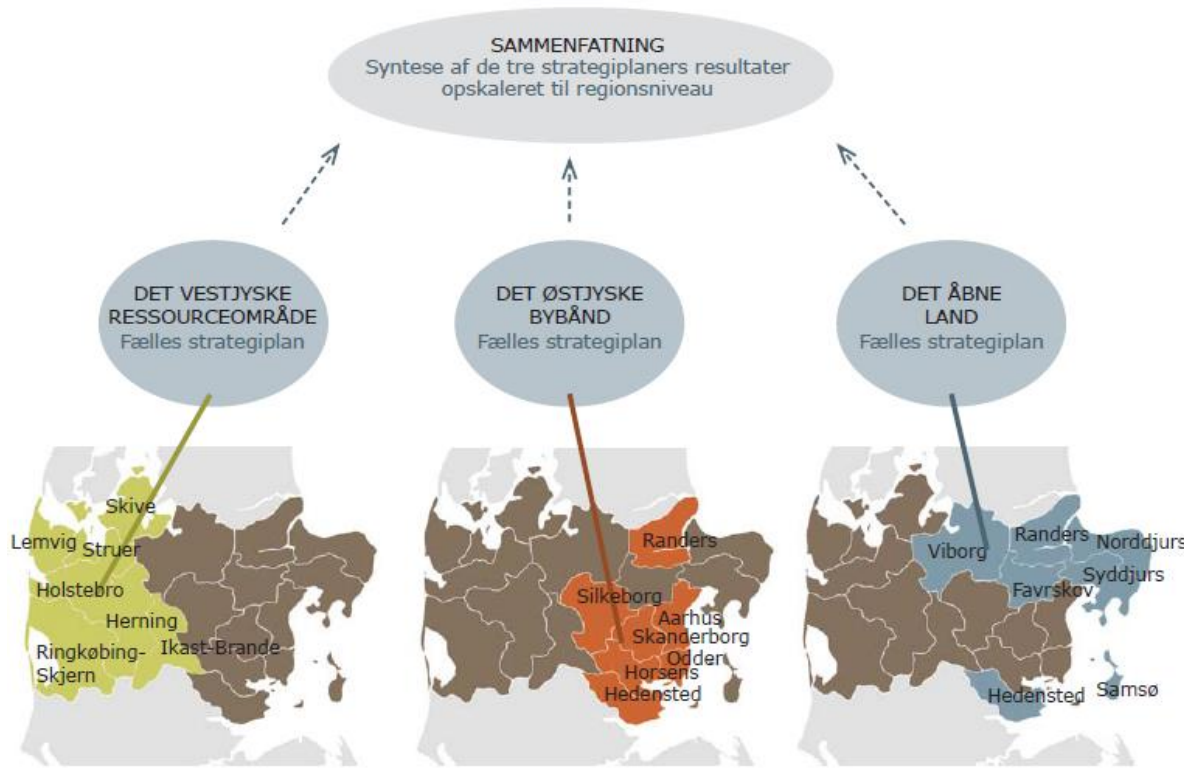
The municipalities: Heat planning and regulatory approval to local utilities



How can we work as a region with no formal authority??

- Facilitate cooperation in the region between municipalities, energy companies etc.
- Monitor progress of renewable energy
- Initiate development projects
- Initiate general business support initiatives

Strategic energy planning in CDR



Participants

- 19 municipalities
- 1 region
- 2 universities
- 13 energy supply companies
- 5 energy actors

Financed by

Danish Energy Agency
CDR

Three working groups in the project 'midt.energistrategi'

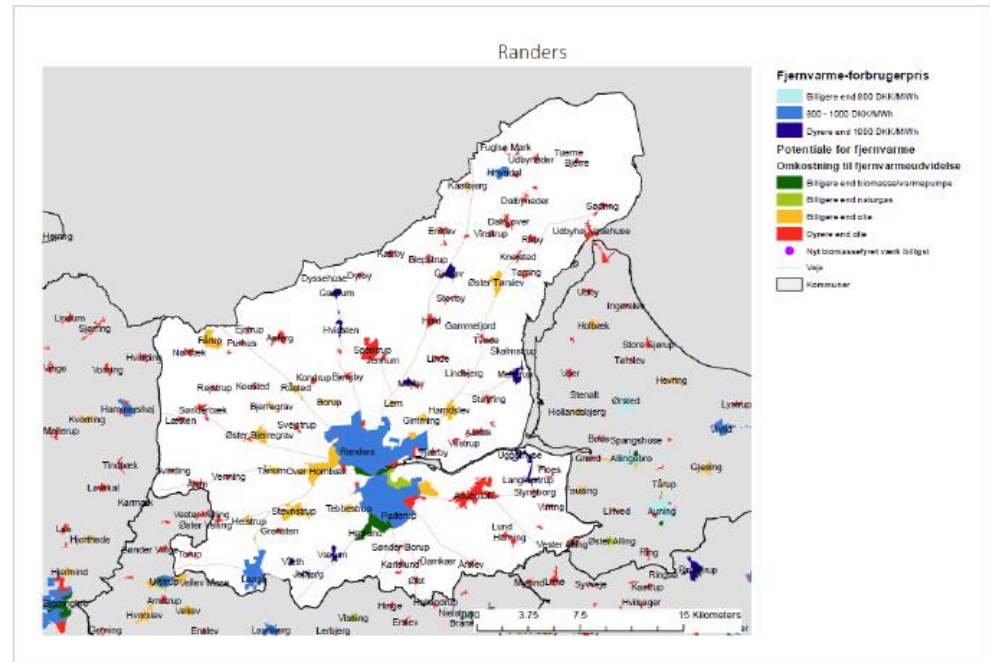
Strategic Energy Planning in CDR

7 FOCUS AREAS

- Onshore Wind Power
- Biogas from manure
- Residual biomass from Farming & Forestry
- ➔ • Central Heating Supply of the future
- Energy Efficient Housing
- Energy Efficient Industry & Farming
- Green Transportation

Screening of the border between district heating and individual heating supply

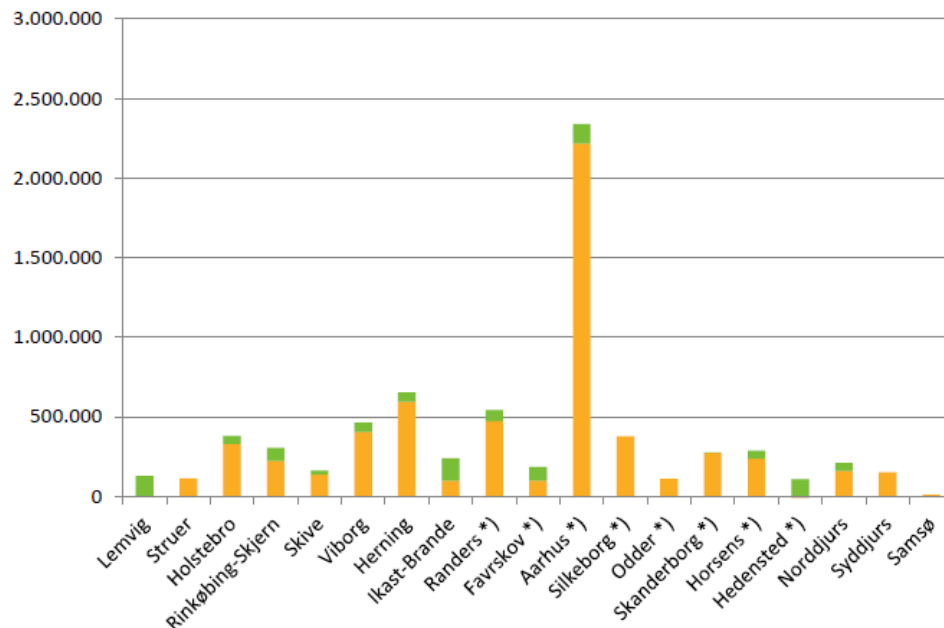
- Maps for the 19 municipalities
- Screening on basis of consumer economy
- Useful for dialogue between the municipality and heating supply utilities



Blue: existing DH areas (dark blue indicates high consumer prices)
Green: DH is cheaper than individual biomass boilers and heat pumps
Light green: DH is cheaper than individual gas boilers
Orange: DH is cheaper than individual oil boilers
Red: DH is more expensive than individual oil boilers

Screening of the potential for using industrial surplus heat in the district heating

Ses overskudsvarmepotentialet derimod i forhold til kommunernes samlede fjernvarmegrundlag, viser figur 5, at det udgør fra 0 til 121%:



17 %
of the District heating demand in CDR can be covered by surplus heat from industry and heat pumps

Figur 5 Overskudsvarmepotentialet som andel af kommunernes fjernvarmegrundlag (netto 2014 uden ledningstab) (kilde:AAU's beregning af nettovarmebehov, jfr. delrapporten Afgrænsning)

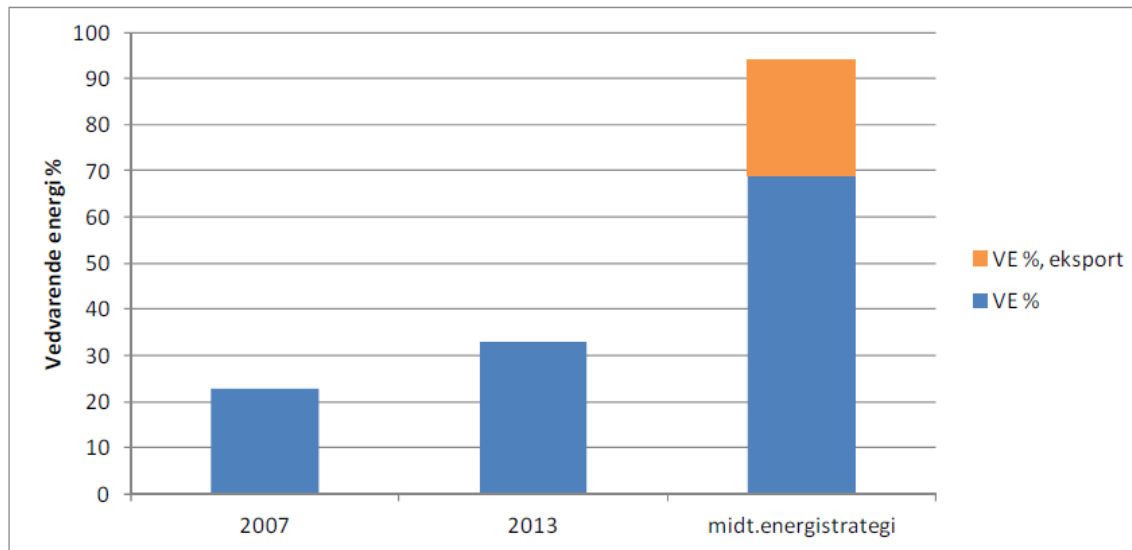
Strategy for district heating



- 100 % renewable resources
- Gradually reduce the biomass consumption in favor of “Fuel free” district heating solutions as:
 - Surplus heat from industry
 - Solar heating
 - Heat pumps driven from wind power
 - Geothermal heating
- Expanding district heating (60 % → 70 %)

'midt.energi' – the conclusion

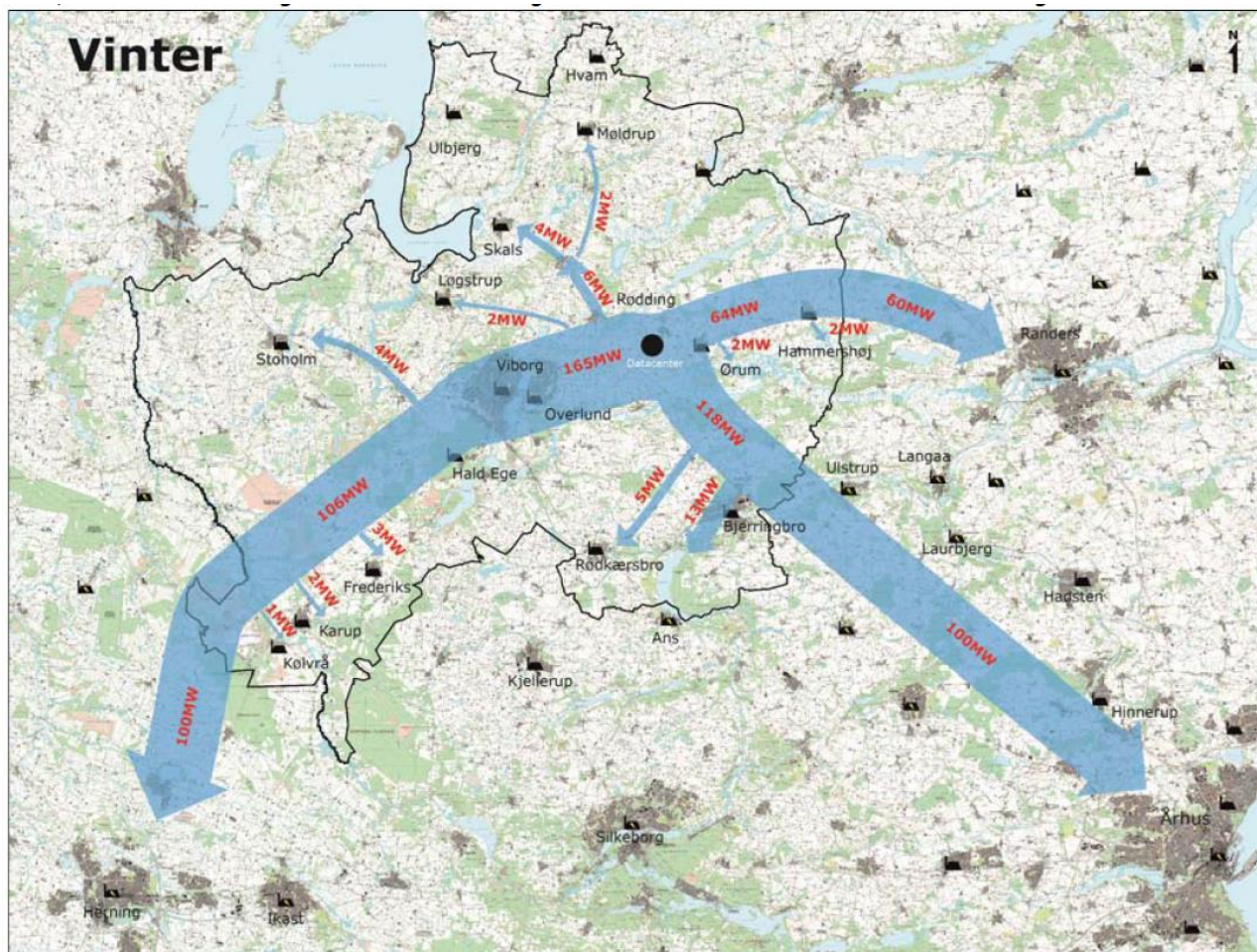
The share of Renewable Energy in CDR can increase from 33 % today up to 70 (90)% by the year 2035 based on known technologies and mainly local resources



Figur 20: Viser med blå markering udviklingen i andelen af vedvarende energi efter beregningsmetoden i Energistyrelsens vejledning i strategisk energiplanlægning. Hertil lægges den orange markering, hvis eksporteret el fra vindkraft medregnes i VE %en.

A new Apple Datacenter (Viborg)

A DH transmission line analyses across municipal borders



Surplus heat potential from Apple datacenter
= 150-200 MW

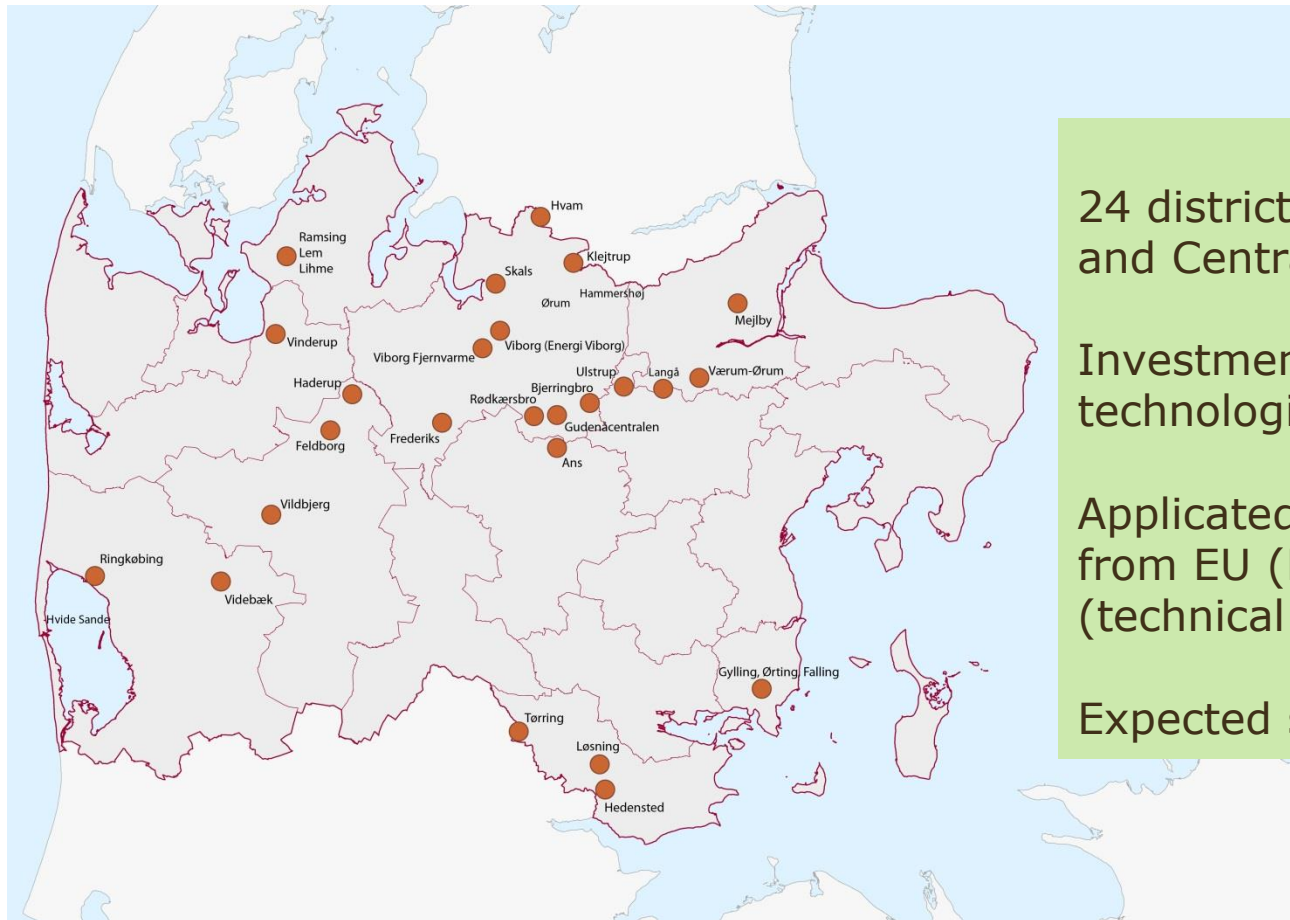
~ The total potential for all other industrial surplus heat in the total Central Denmark Region!!

Apple plus all other industrial surplus heat
= 30 % of the district heating demand in CDR

The analysis is co-financed by Viborg Municipality, Central Denmark Region and the local heat supply companies.

Our latest effort... "REFER-CDR"

"Implementing the Energy Strategy"



24 district heating companies
and Central Denmark Region

Investments in renewable
technologies at the DH plant

Applied for financial support
from EU (ELENA-office) to TA
(technical assistance)

Expected start February/March

Thank you for your attention

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