



Development and Role of Flexibility in the Danish Power System

*- Solutions for Integrating 50% Wind and Solar,
and Potential Future Solutions for the
Remaining 50%*





AGENDA

- Development of VRE share and energy system in DK
- Status of the electricity mix and sector-coupling and flexibility
- VRE does not compromise system security.
- Expectation to the future development of VRE

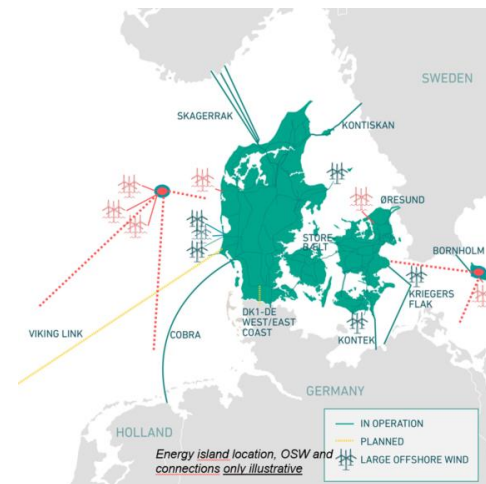
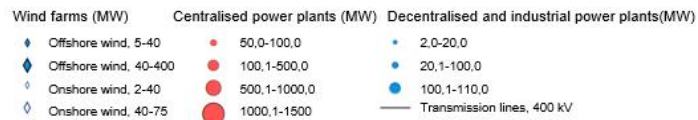
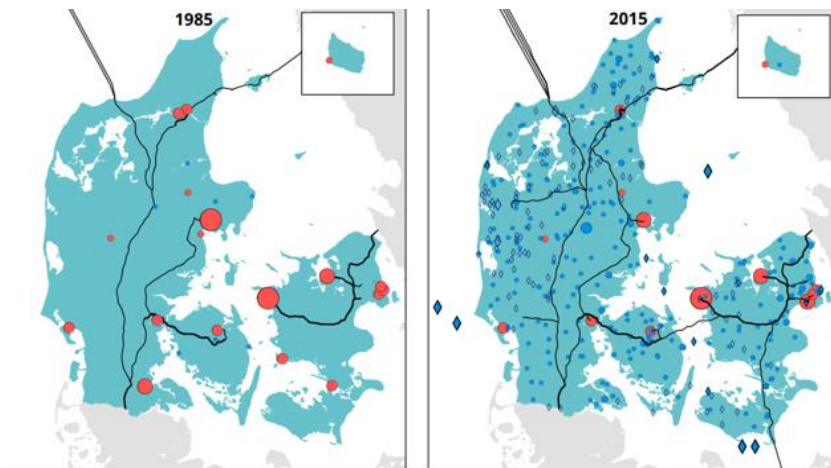


OUR OWN ENERGY CRISIS IS WHAT GOT US STARTED

Due to the oil crisis, Denmark had car-free Sundays from 25 November 1973 to 10 February 1974

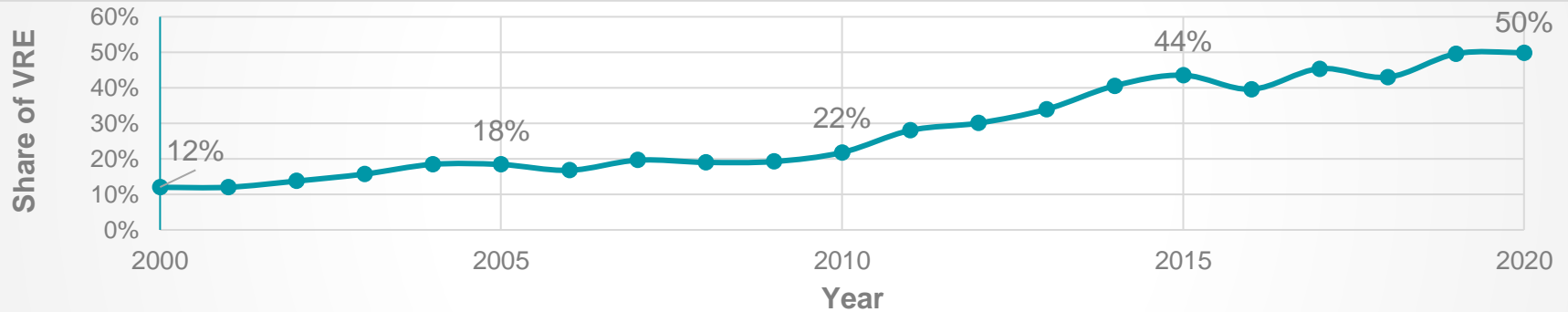
In the 1970s, **the oil crisis** forced us to take a long, hard look at ourselves...

...SINCE A LOT HAS HAPPENED



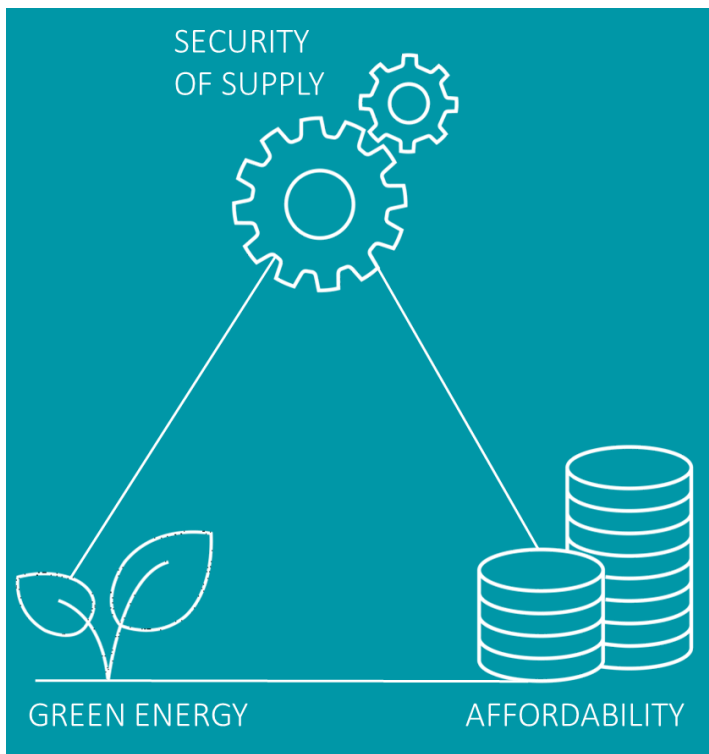
Green transition and the increasing share of VRE

5 main categories of flexibility and role of the market

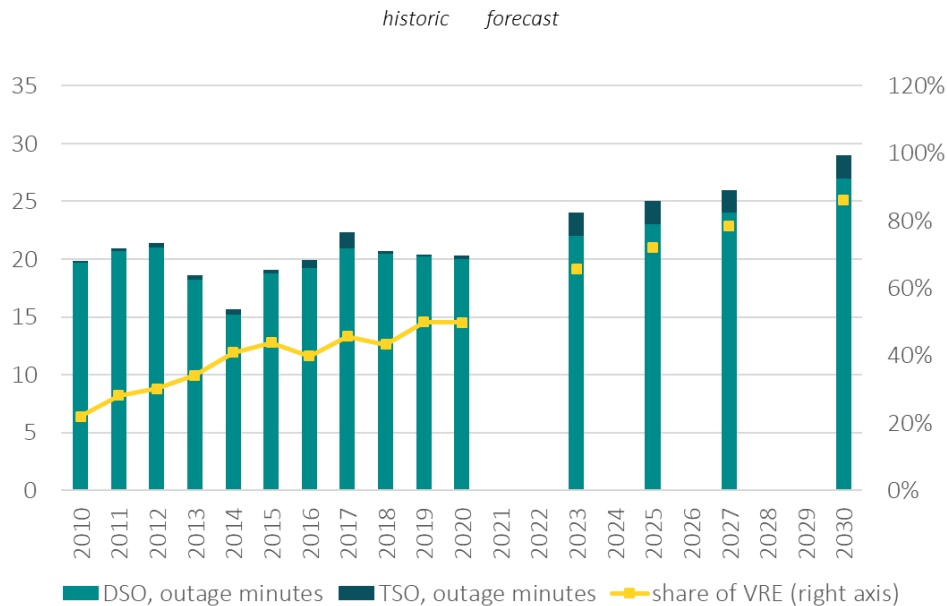


	2000-2004	2005-2009	2010-2015	2016-2020	After 2020
Flexible thermal power plants	Present	Present	Present	Absent	Absent
Utilisation of interconnectors	Present	Present	Present	Present	Absent
Forecasting and scheduling systems	Absent	Present	Present	Present	Present
Sector coupling	Absent	Present	Present	Present	Present
Demand-side flexibility	Absent	Absent	Absent	Present	Present

SECURITY OF SUPPLY NOT COMPROMISED



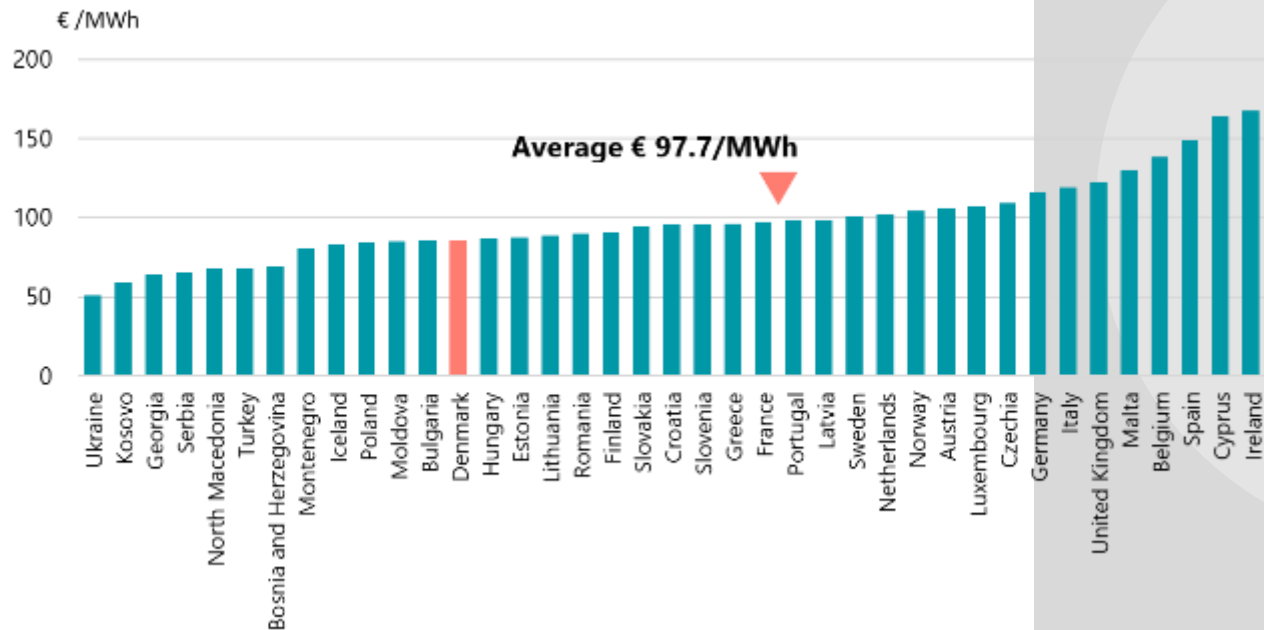
Historic and future development of security of supply and share of VRE



Source: Energinet security of supply report, 2021. Danish Energy Agency: Monthly energy statistics and Assumptions for Energinet, 2021

Why Denmark?

Electricity prices excluding VAT and taxes in EU, 2019 H1

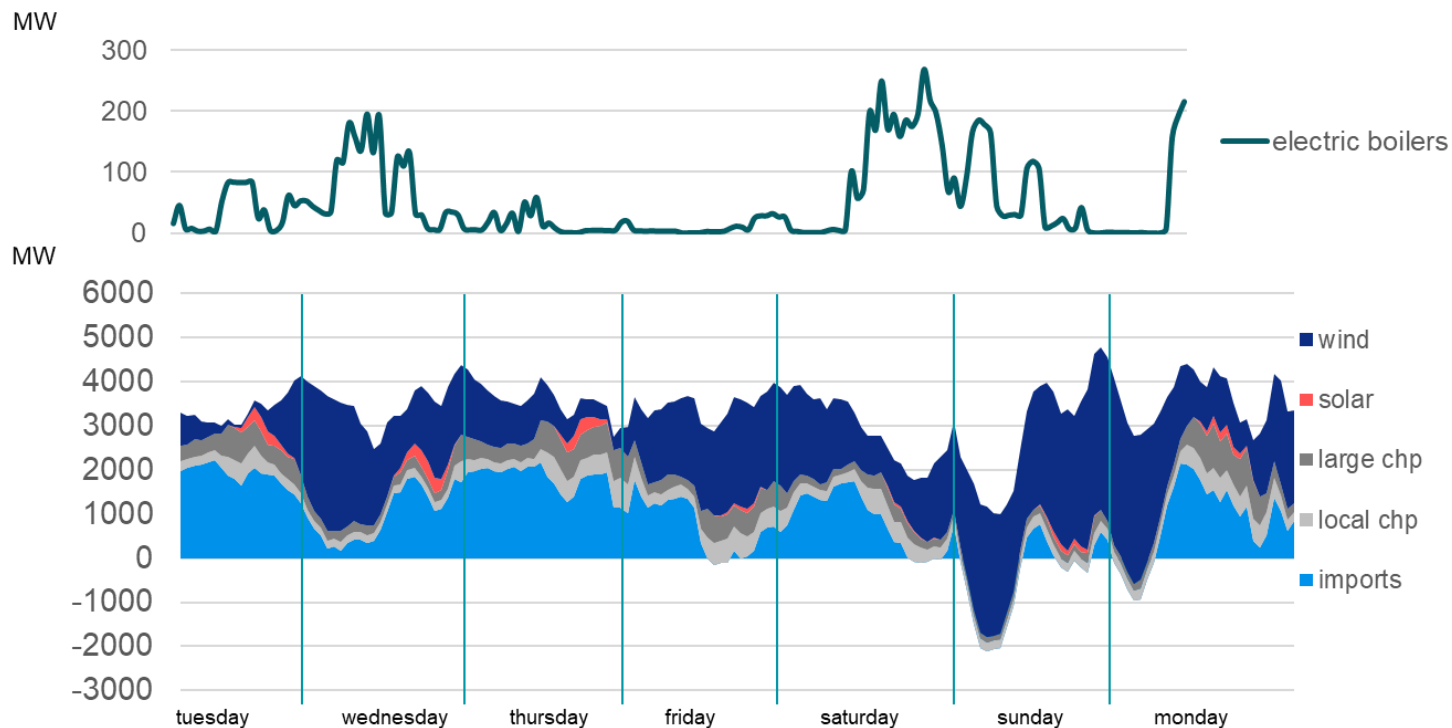


Costs

Consumer prices of electricity are below average in Denmark incl. grid tariffs

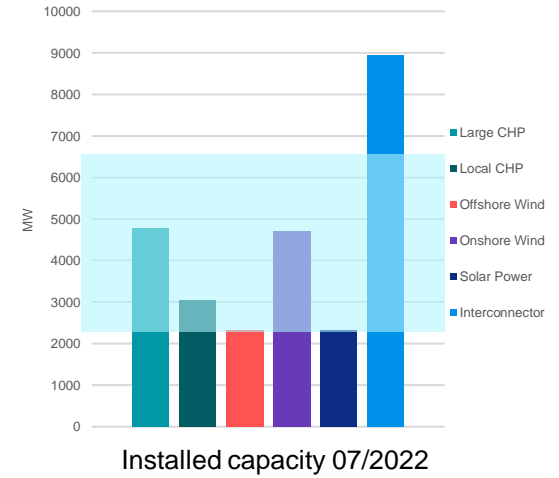
FLEXIBILITY FROM THE ENERGY MIX

A RANDOM WEEK – NOVEMBER 17-23, 2020

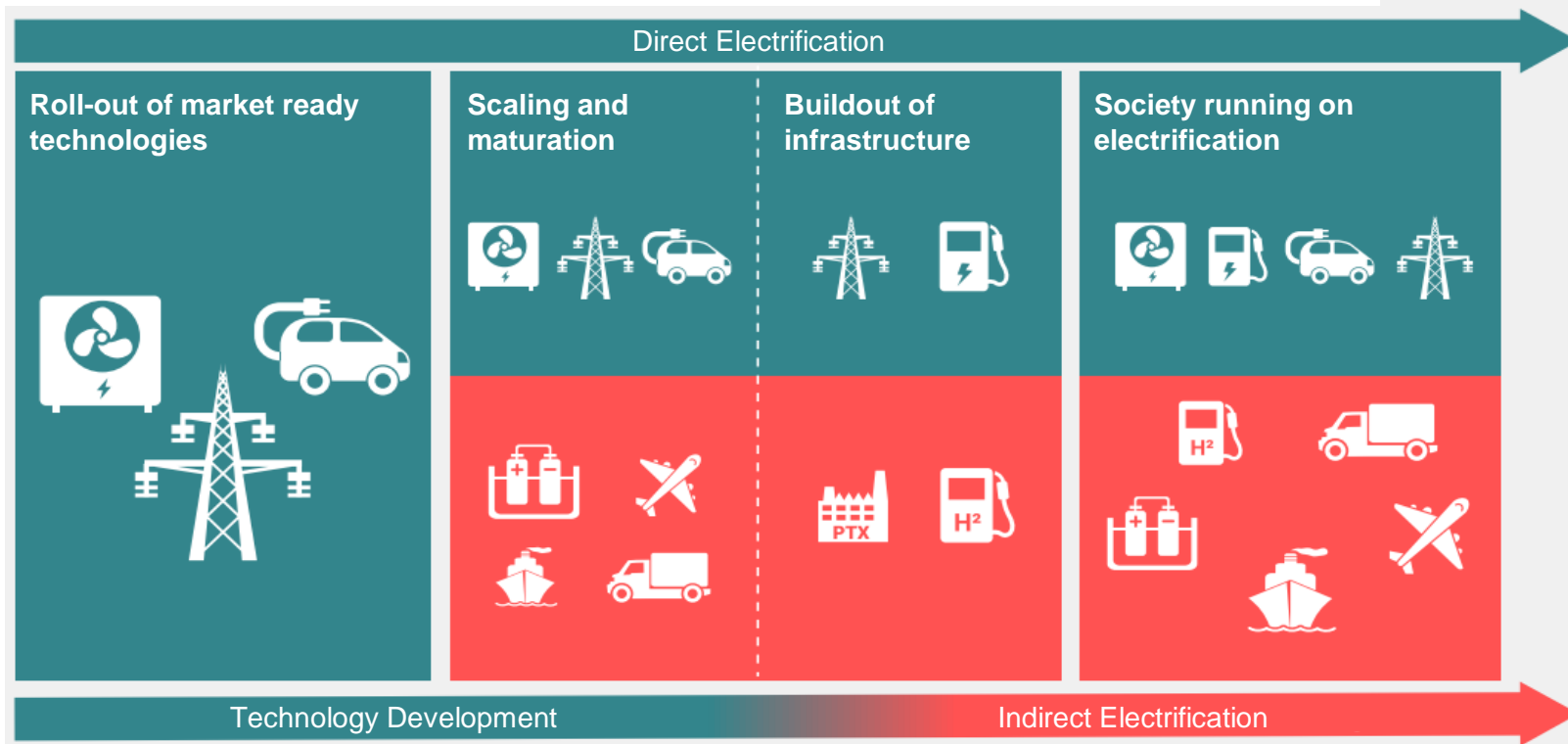


World's First Energy Islands

Green power plants at sea



Reaching Net Zero





Flexibility in the system

- Incentives through price signals
- District heating and electrification play a key role in providing flexibility
- VRE does not compromise system security
- Pushing the boundary



Thank You