

# OFFSHORE WIND POWER







# THE POTENTIAL OF OFFSHORE WIND



# Offshore wind is on the rise

- Energy demand is increasing globally
- The worldwide installation of offshore wind capacity reached 23 GW by the end of 2018 and projected to 15-fold by 2040
- Currently provides just 0,3% of global electricity supply indicating huge untapped offshore wind potential
- Expected to be an cost-efficient source in future electricity mix across many countries

World Map Offshore Wind Energy Connected As Of October 2019



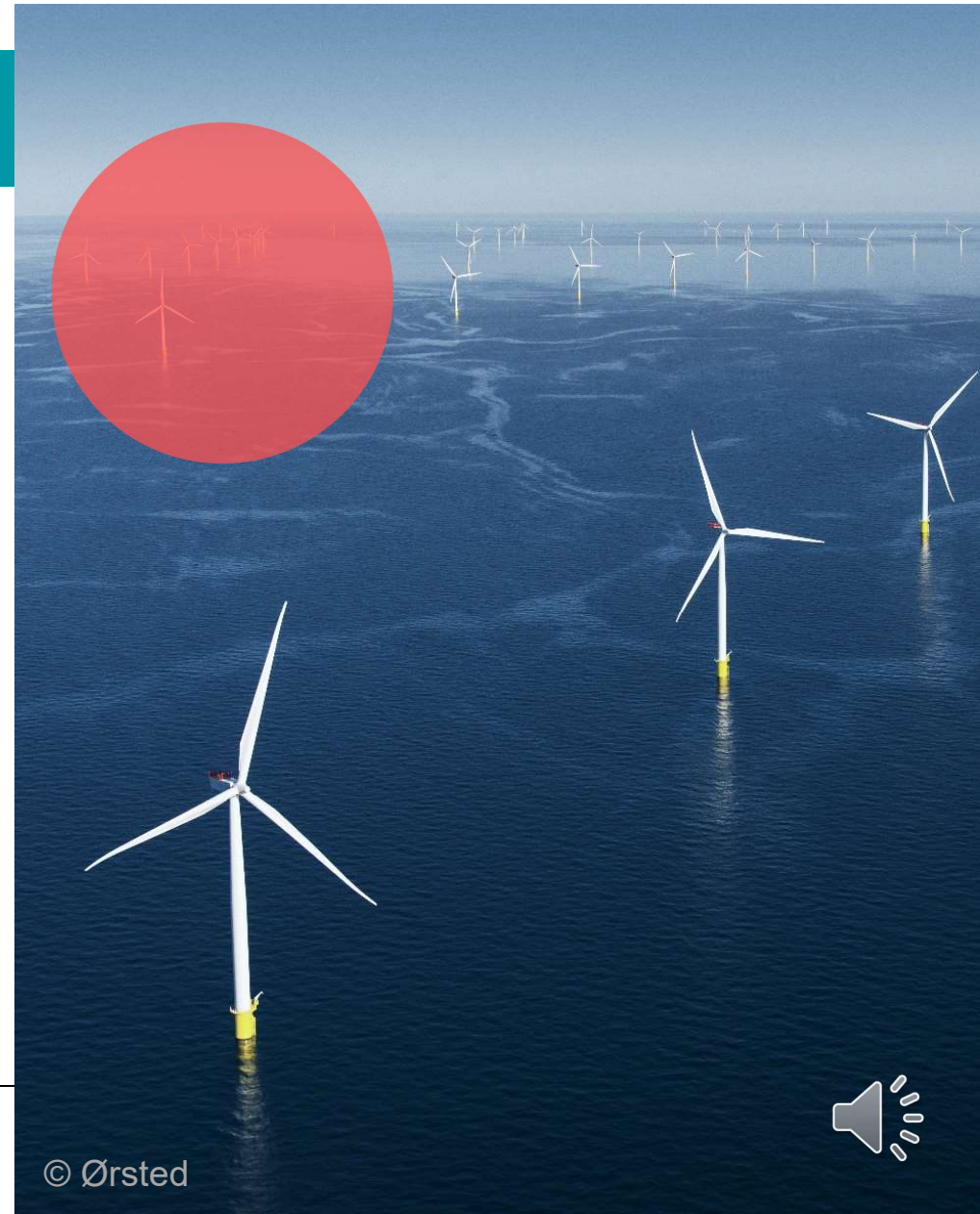


# Benefits of Offshore Wind



## The advantages are many

- Key technology to accelerate clean energy transitions and minimise fossil fuel dependence
- High capacity factors can contribute to security of supply
- Lower interference with land use
- Potentially closer to major demand centers
- Can create local jobs both short and long term







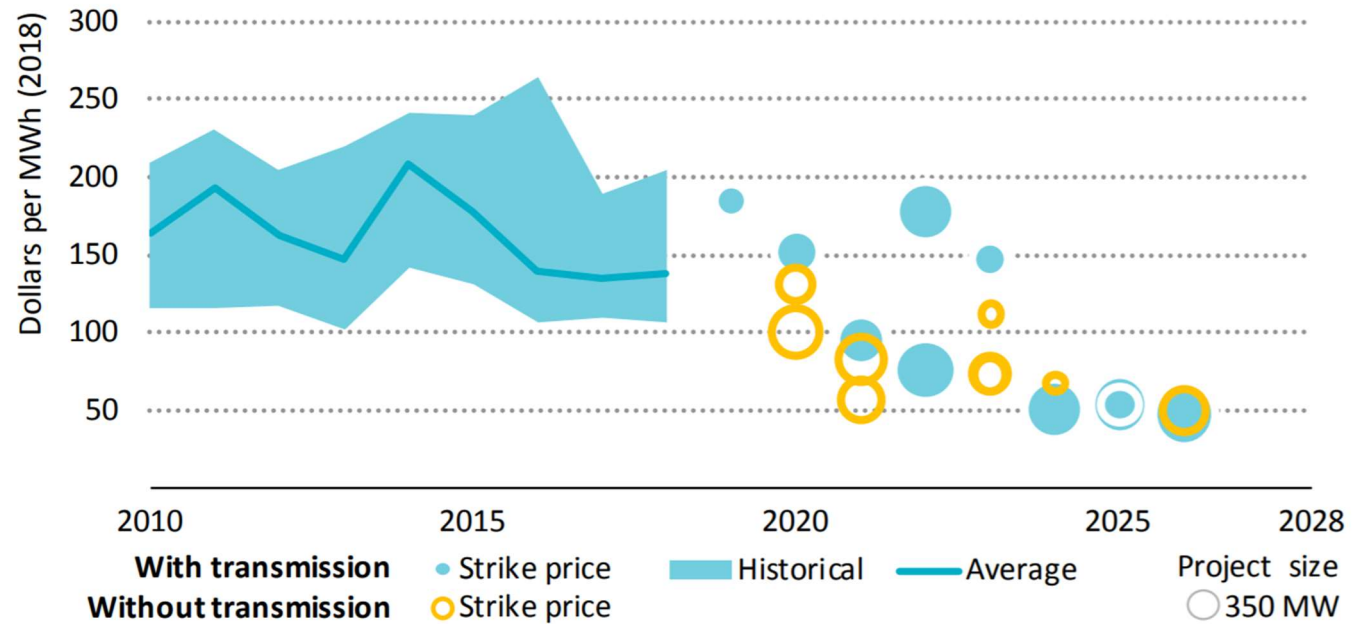
## KEY MARKET DRIVERS FOR OFFSHORE WIND

- Political commitment
- Regulatory transparency
- Long term vision

# Rapid reduction in costs

- Improved technology
- Mature markets with developed supply chain
- Competitive allocation with less regulatory risk
- Increased investor confidence

## Historical LCOE of offshore wind and strike price in recent auctions in Europe



Source: IEA (Offshore Wind Outlook 2019)



# The Danish Offshore Wind Approach







# POLICY AND PLANNING IN DENMARK

- Broad and long term political agreements
- Centralised permitting
- Transparent and open process
- De risking approach



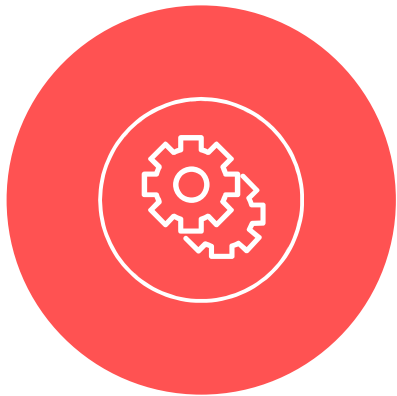
# THE DANISH ENERGY AGENCY AS A ONE- STOP-SHOP

- Coordinated planning and permitting at the Danish Energy Agency
- A smooth and transparent consenting process for permits



# The Danish tender model – key elements

## THOROUGH PLANNING



Maritime Spatial Planning  
and site selection

Preliminary studies made  
available by the DEA

## FAIR COMPETITION



Prequalification only based  
on financial and technical  
capacity

## TRANSPARENT PROCUREMENT



Dialogue with the industry  
and negotiation with  
prequalified bidders

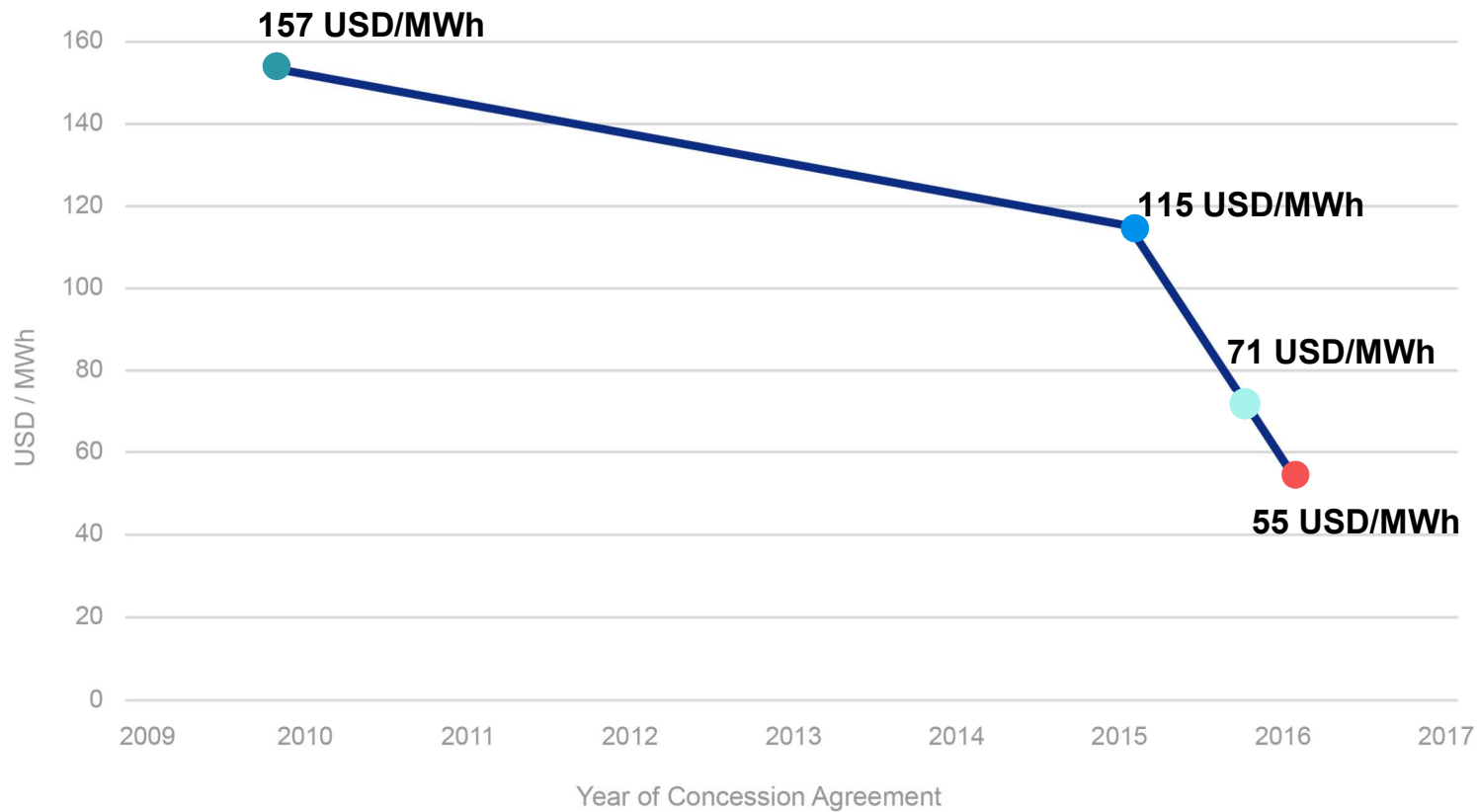
## GUARANTEED GRID



Priority access and timely  
grid connection

# Evolution of the winning bid price for Danish offshore wind farms

(Nominal 2019-prices)

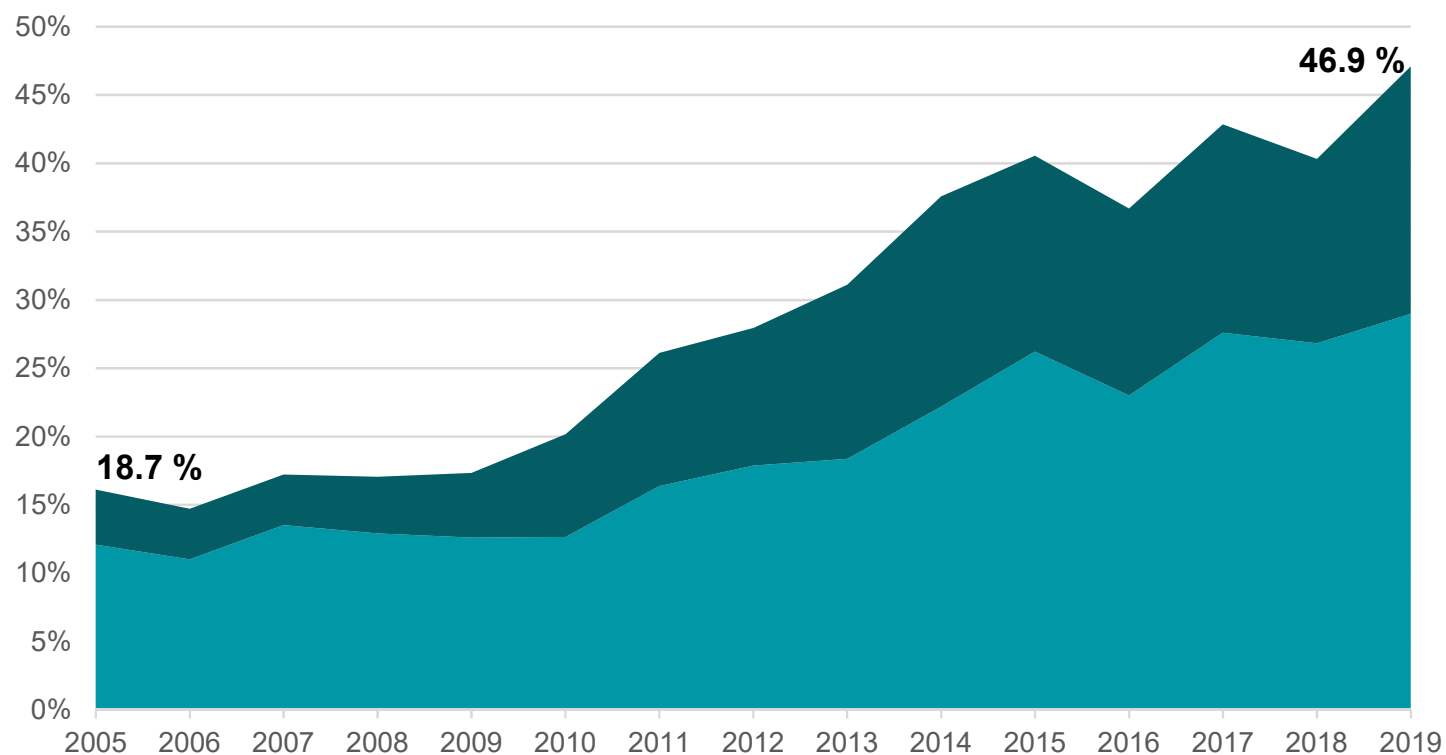


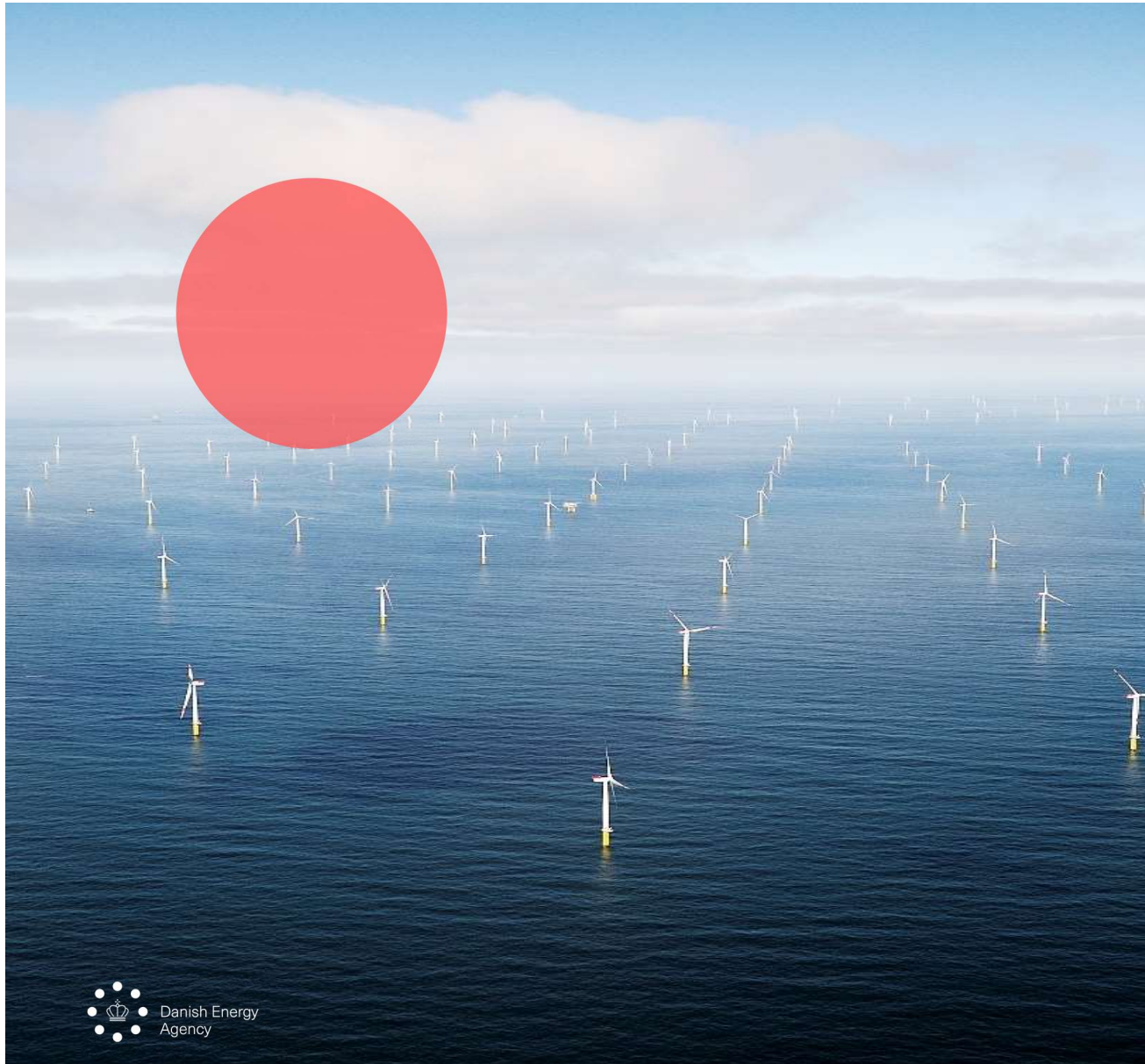
- Anholt (2010)
- Horns Reef 3 (2015)
- Vesterhav North and South (2016)
- Kriegers Flak (2016)



# Denmark world's leading country in using wind power

Electricity Demand met by wind power in Denmark (%)





## ADDED VALUE AND LOCAL BENEFITS FROM OFFSHORE WIND DEVELOPMENT

- Reduce dependency on fossil fuels and meet growing energy demand
- Opportunities for economic growth and long term job creation
- Cost of electricity in Denmark is the lowest in Europe



# Inspirational topics

Is offshore wind a suitable technology for the support of the green transition in India?

- Can it provide:
  - Security of supply?
  - Economic growth?
  - New jobs?

Can offshore wind power substitute coal power in India?



# Next session

Upcoming sessions :

1. Marine Spatial Planning
2. One stop shop
3. Case example of Horns Reef OWF