



# Cost of Energy – R&D prioritization

E W TE

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**The world is in a fundamental transformation.**






**We face major challenges ...**



**Increasing energy demand**



**Diminishing resources**



**Climate change**

**... and we also have an answer.**



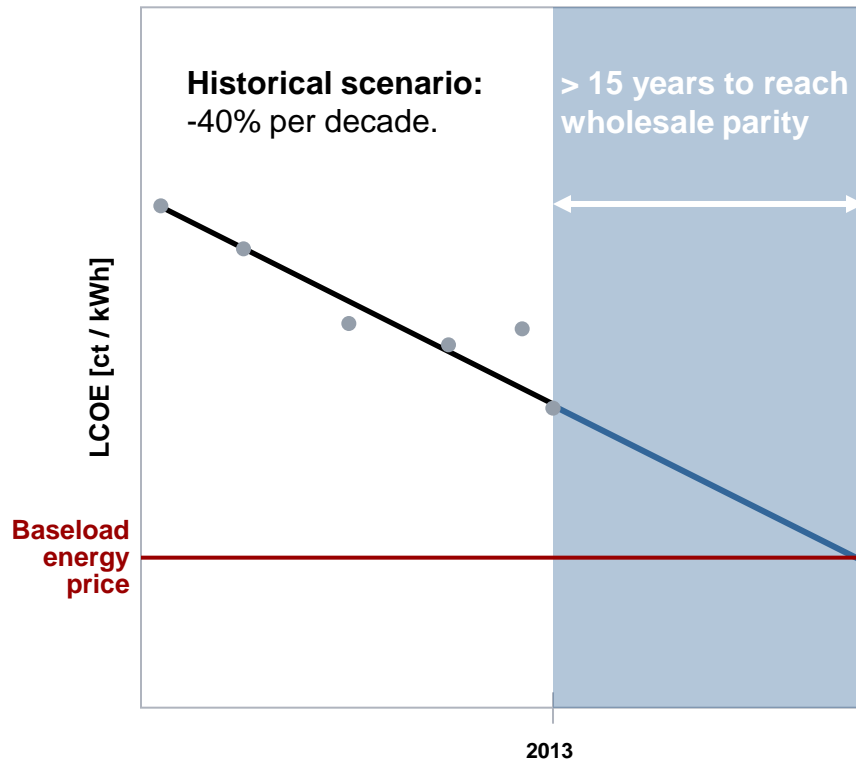
**BUT...**

**Energy from wind power is still seen as expensive.**

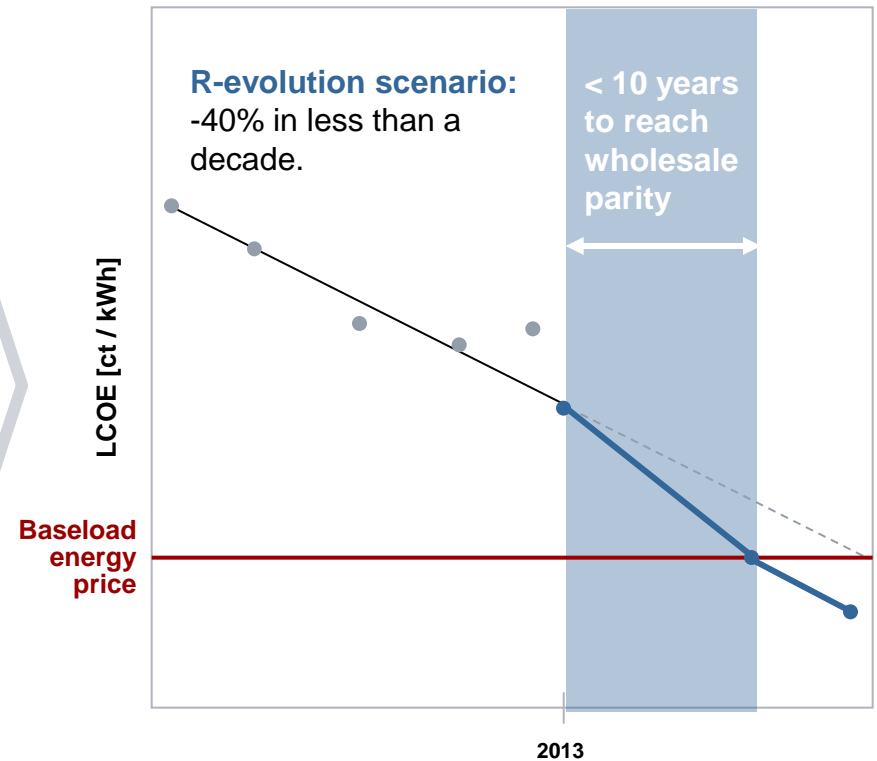
**Subsidies won't last forever.**

# We want to speed up the reduction of cost of energy - R-evolution will be the “time machine” needed

## “Business as usual” scenario

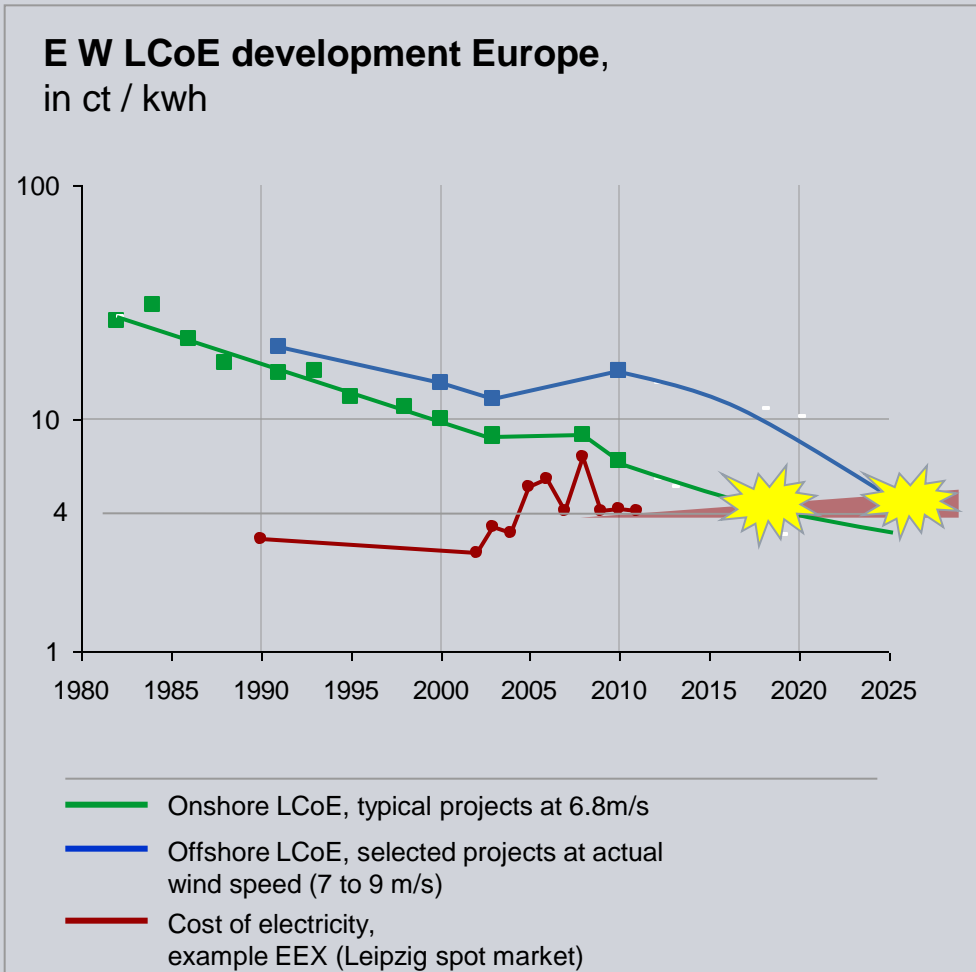


## R-evolution as a “time machine”

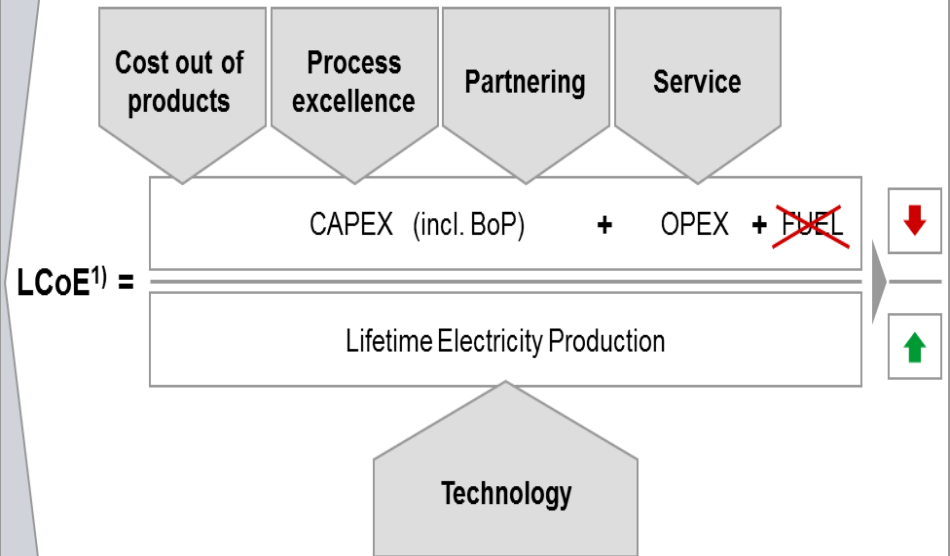


Note: Past and planned LCOE development of SWP's portfolio

## Onshore will meet the LCoE target sooner than Offshore



### Levelized Cost of electricity (LCoE), in ct / kWh

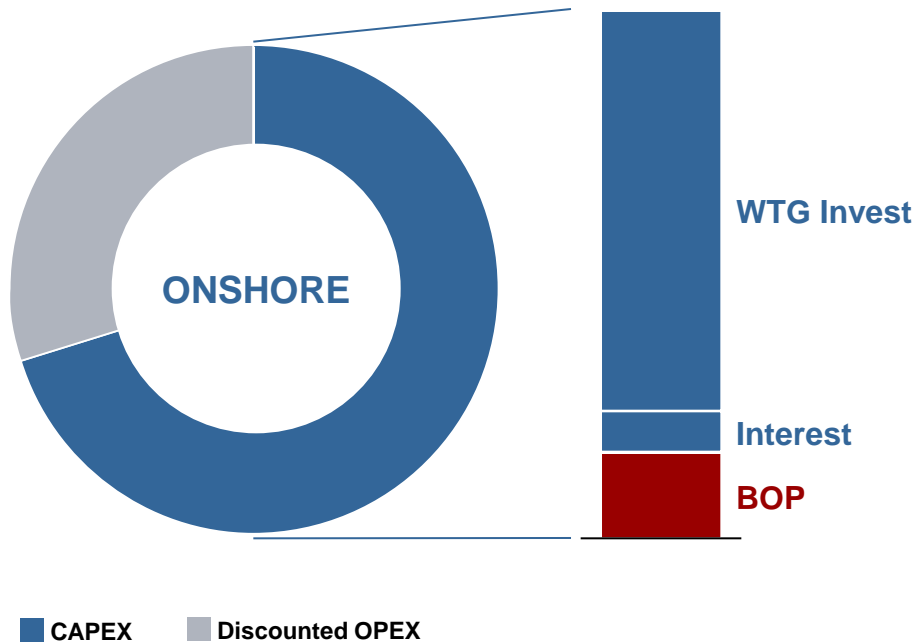


~2/3 of market is LCoE driven, share is increasing

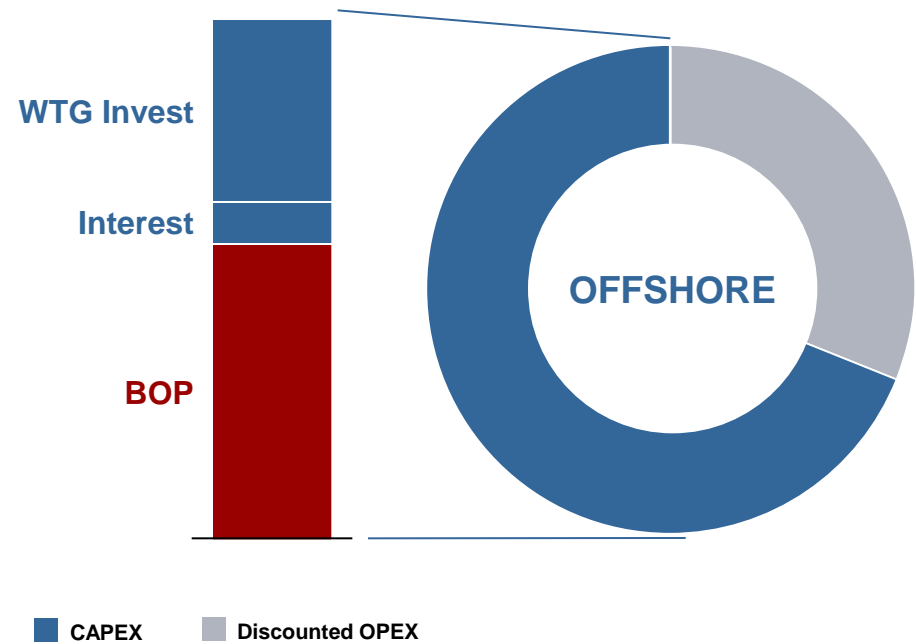
1) Discounted with country specific WACC (financing cost)

# However, the CAPEX challenges faced Onshore and Offshore are different

Onshore project cost split



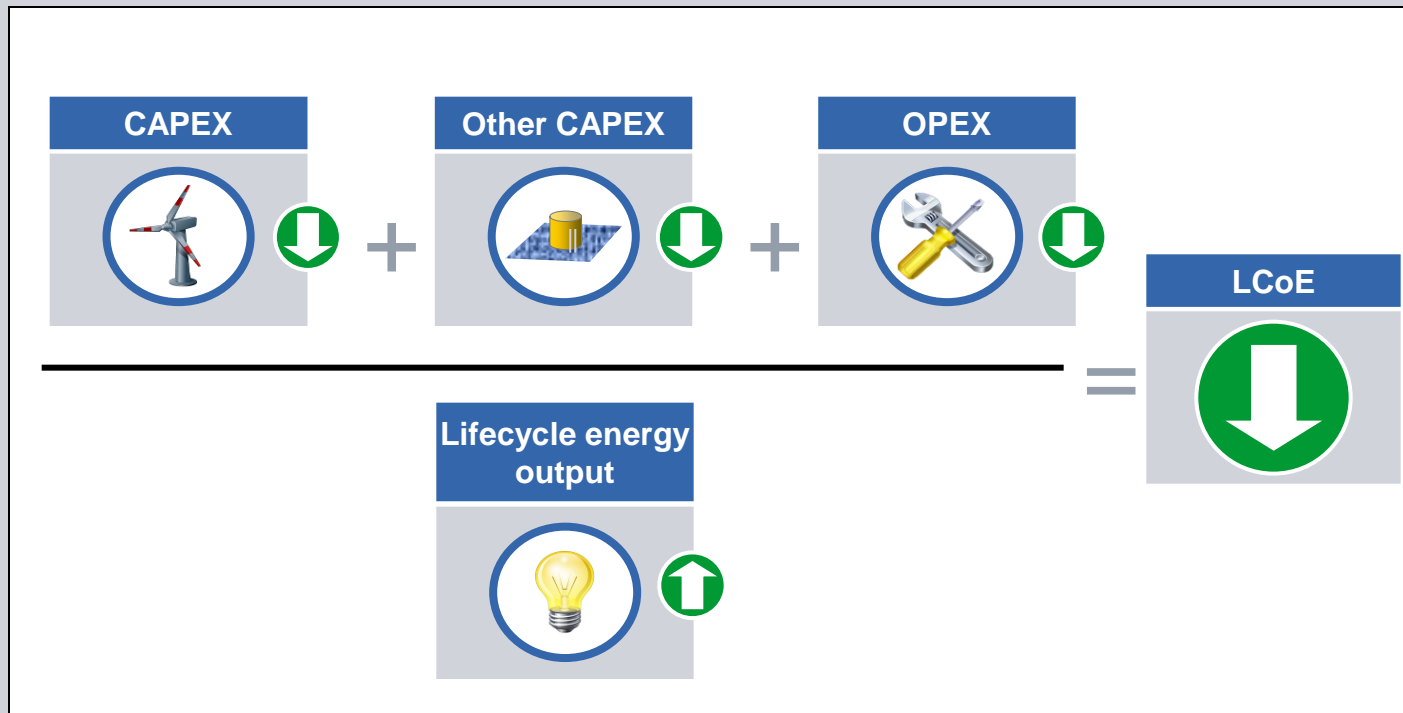
Offshore project cost split







**Aspects determining the Balance of Plant (BOP) are outside of Siemens Wind Power's scope of supply – such as foundations, substations, cable supply, and project costs. Improvements of the BOP costs are also addressed in the R-evolution program.**



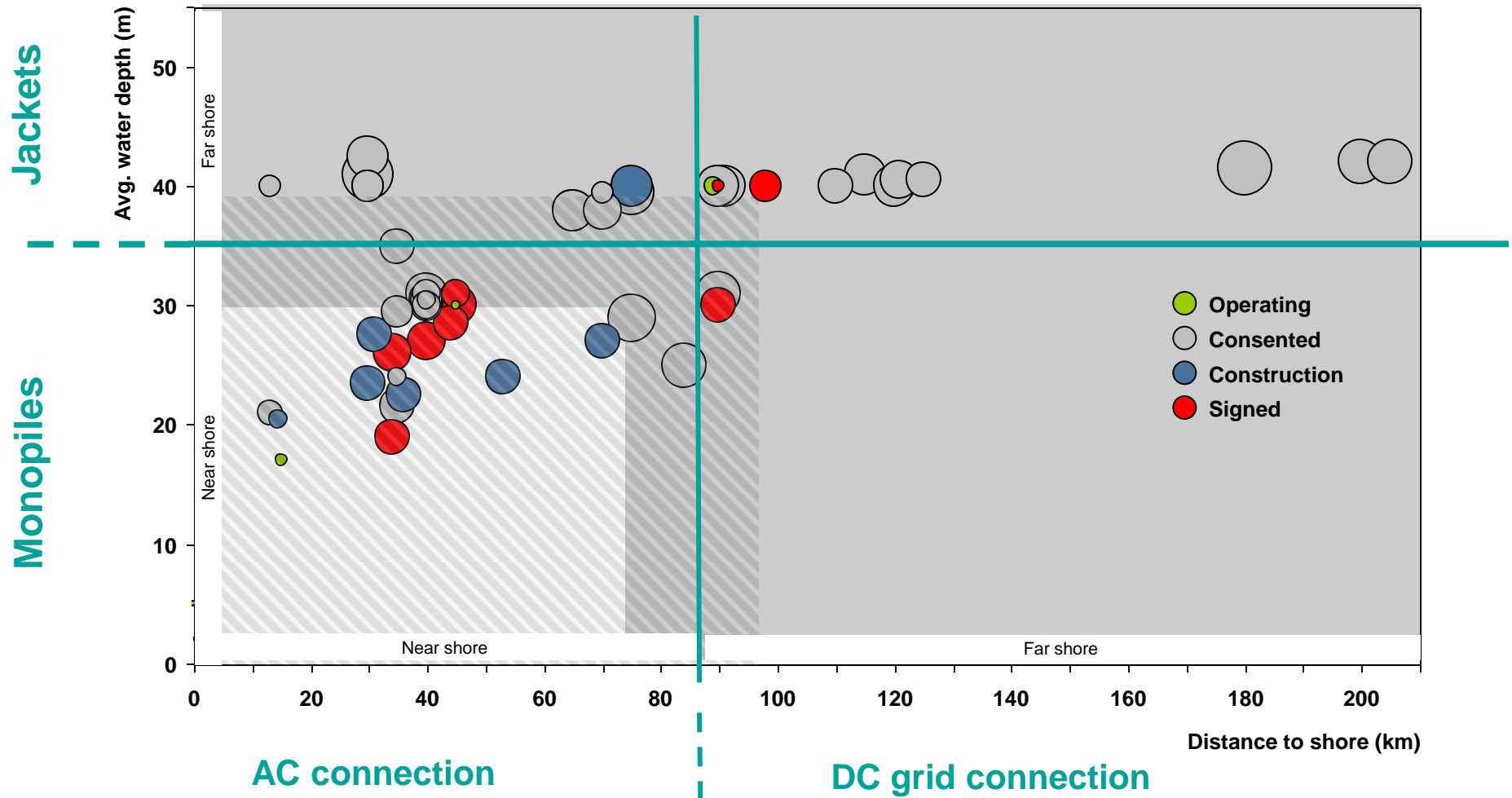
And we need to use all available levers to bring the cost of energy down to meet our target



-  **Reduce Capital Expenditures (CAPEX)**  
(e.g. lower weight, Less components)
-  **Reduce other CAPEX outside Siemens scope**  
(e.g.: Offshore foundations, Grid access)
-  **Reduce Operating Costs (OPEX)**  
(e.g.: lower maintenance through higher reliability)
-  **Increase lifecycle energy output**  
(e.g. higher efficiency, longer life time)

# Offshore Sites conditions is increasing the need for technology developments to bring down the cost of Energy

Installations in GW 2004 – 2023, current technology solutions



# Market requirement defines product targets for R&D New Product Development projects and drives technology development accordingly



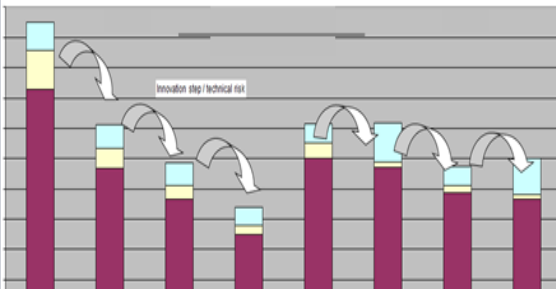
## Technology Roadmap

Focus:

- Enable LCOE trajectory
- Mature technologies for introduction in product development projects

Horizon: 2-10 Years

Technologies differentiate based on:  
development possibilities LCC  
Risk profile Maturity/development steps

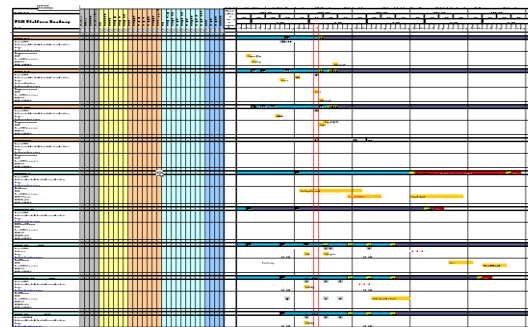


## Product Roadmap

Focus:

- Market requirement / fit
- LCOE reduction
- Product risk profile
- Introductions from Technology roadmap

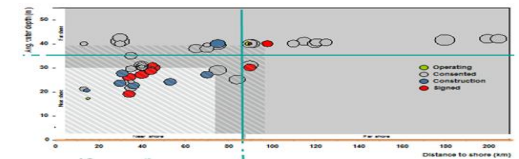
Horizon: 5 Years



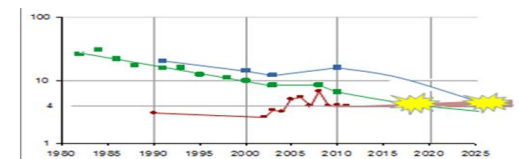
## Business Plan

Focus:

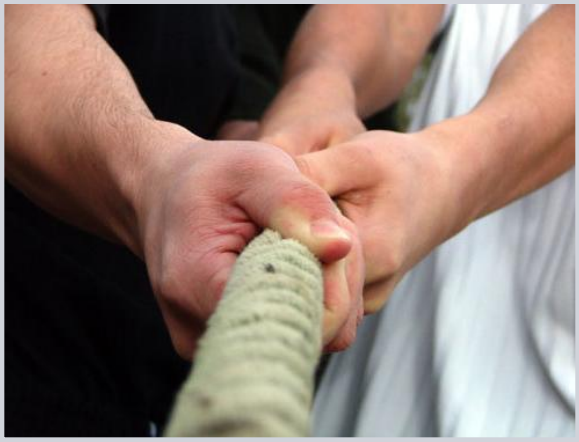
- Market Requirements
- Customer Business cases



	2014	2015	2016	2017	2018	2019	2020
Project 1	█						
Project 2		█					
Project 3			█				
Project 4			█				
Project 5					█		
Project 6						█	



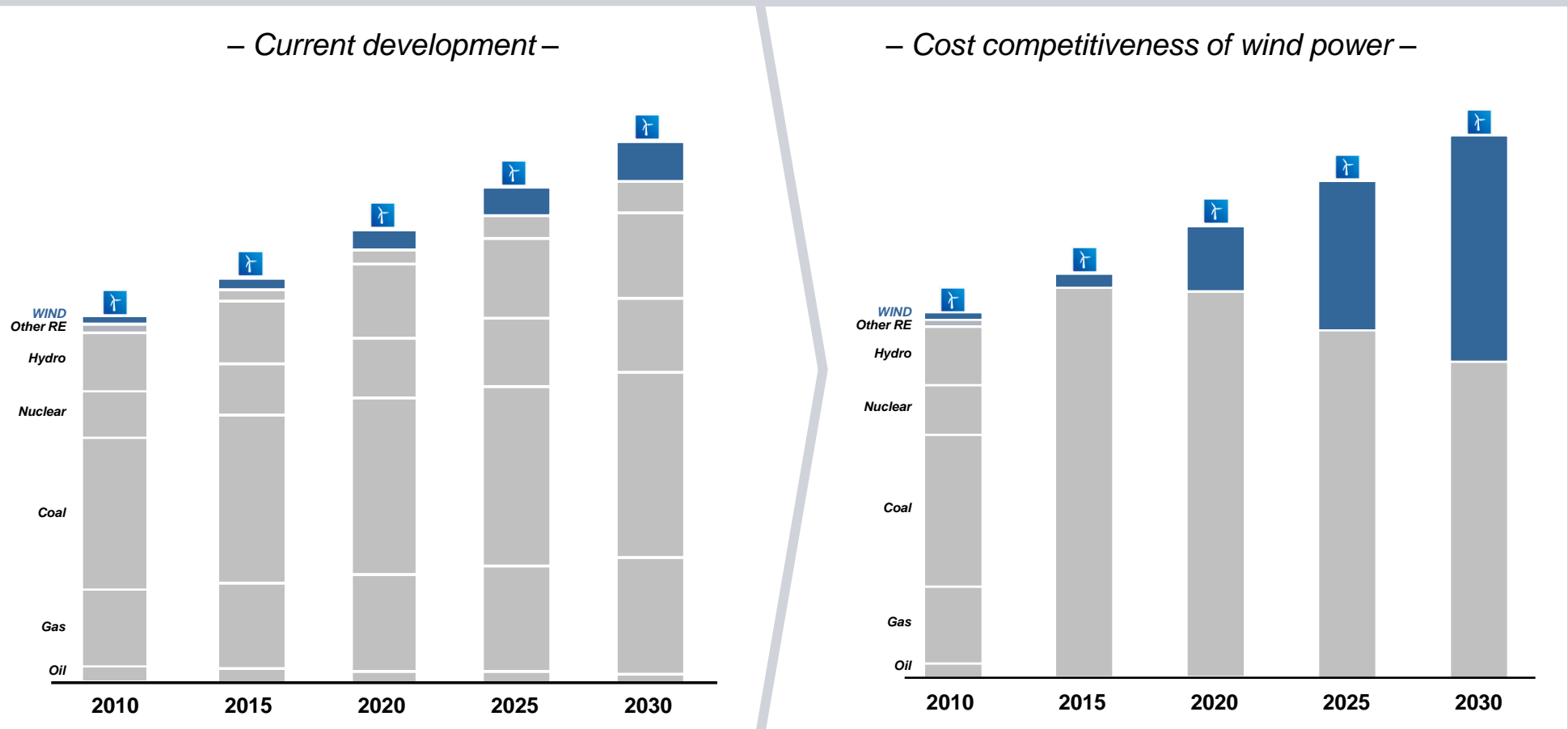
**But we also need the support of society to reach our target**



- ! Stable market conditions**
- ! Reliable policy framework**
- ! Financial support throughout the decade**
- ! Grid access**
- ! Lean permitting procedures**

# If R-evolution succeeds, electricity from wind would be cost competitive, and the future of energy would be different

## Predicted world electricity generation



Source: "New Policies Scenario" Electricity Generation (TWh) IEA-World Energy Outlook, 2010

**Bringing the costs of energy down  
will change the discussion.**

**From:  
“How can we afford it?”**

**To:**  
**“How can we afford not to?”**