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Ingenuity for life

Offshore Wind
LCoE towards 2020 and beyond

Global Wind Day, Seoul, Korea

Siemens Wind Power Offshore – Facts at a glance

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- Pioneered the offshore market and current market leader
- More than 25 years of offshore experience
- Sold more than 3,100 offshore turbines
- Installed base: >2000 turbines with >7 GW capacity
- Known for robust design with innovative solutions
- A proven 25+ year product lifetime and >95% real availability

Innovation –
An amazing development!

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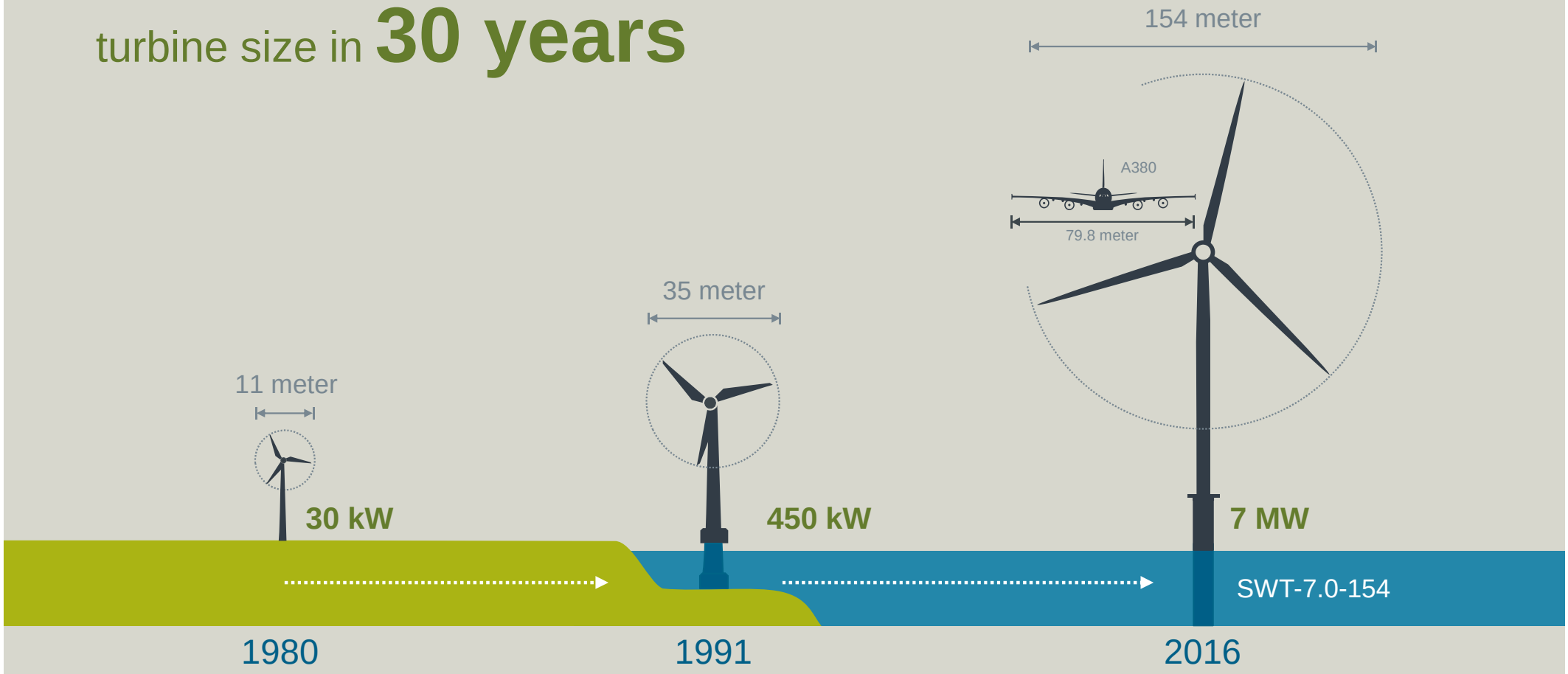
From **30 kW to 7 MW**

turbine size in **30 years**



Size of wind power plants – From few turbines to huge offshore wind power plants

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1991

Vindeby

World's 1st offshore wind power plant

5 MW

2000

Middel-grunden

World's 1st offshore wind power plant w/MW turbines

40 MW

2003

Nysted

World's largest offshore wind power plant in operation

166 MW

2012

Greater Gabbard

World's largest offshore wind power plant in operation

504 MW

2013

London Array

World's largest offshore wind power plant in operation

630 MW

2016

Gode Wind

Next big power plant based on the D6 platform in operation

582 MW

The yardstick to measure cost of energy progress – LCoE

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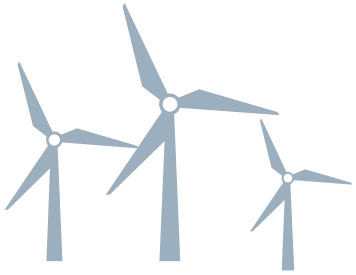
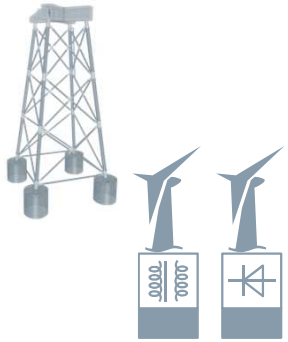
Levelized
Cost **o**f
Energy
(LCoE)





CAPEX Wind turbine + **CAPEX BoP** + **OPEX**

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Lifecycle Energy Output

Siemens defined clear targets – Reaching LCoE below 10 ct €/kWh by 2020

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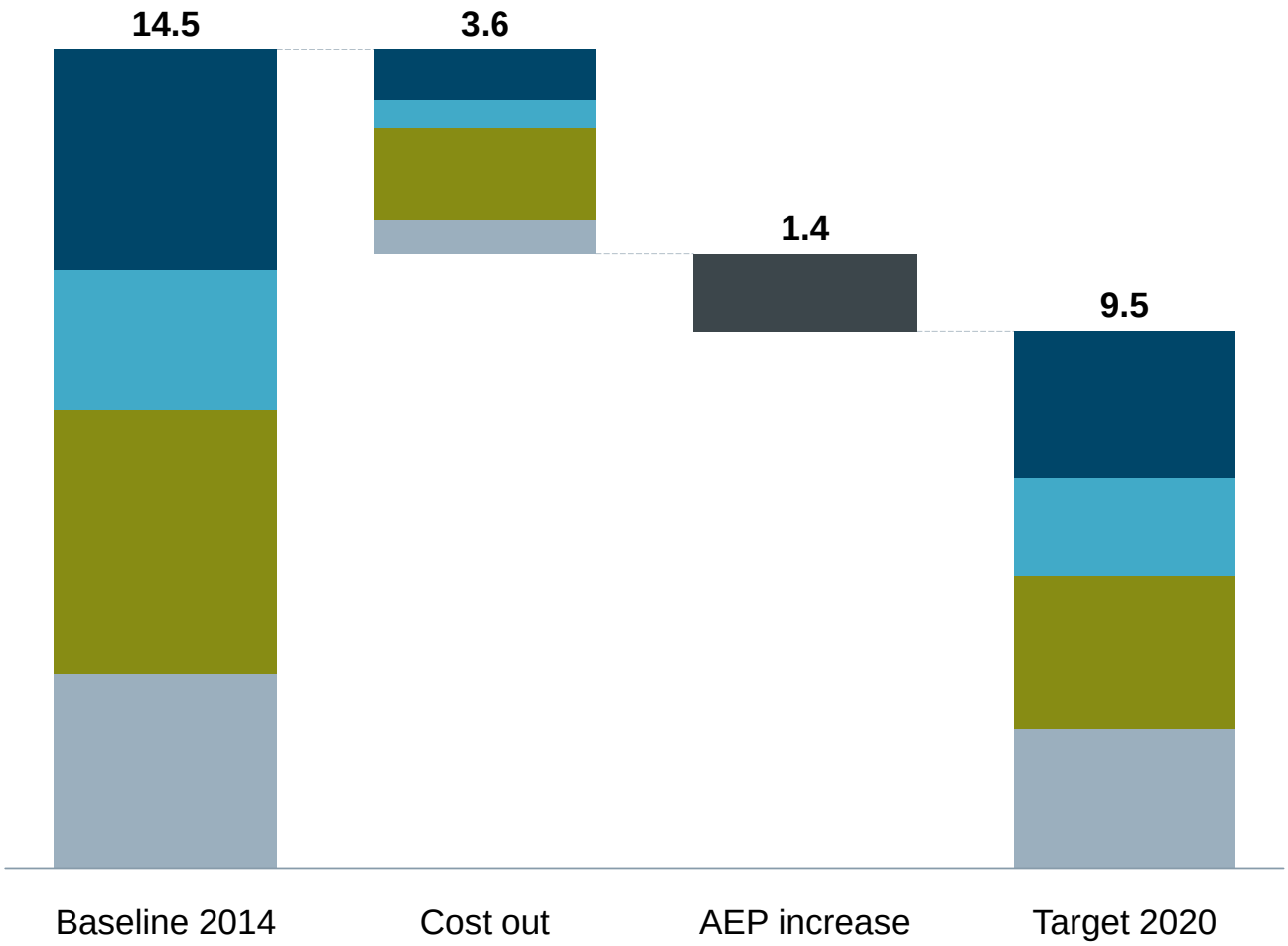
ct.€/kWh



2014 Targets setting

- WTG ++
- Foundation
- Grid Connection
- OPEX
- AEP (Annual Energy Production)

Based on the SWT-6.0-154 turbine; Offshore project 1 GW, 50m water depth, 114 km from shore

2016 – LCoE Status
Key Achievements

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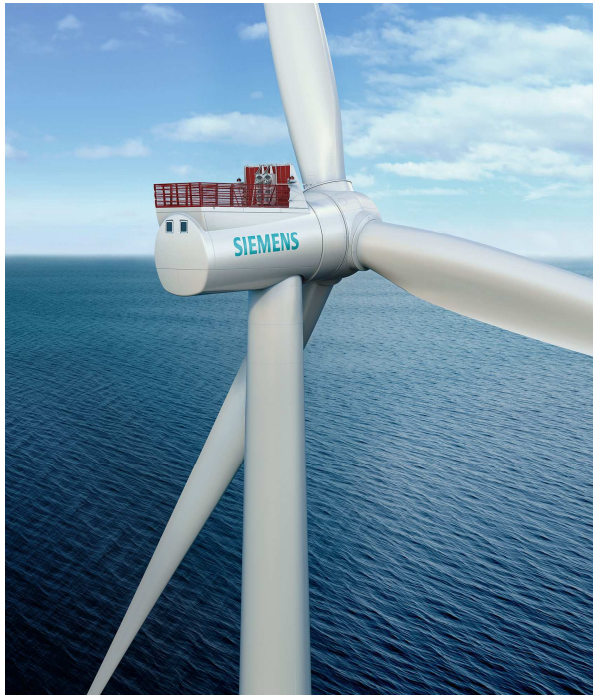
SWT-7.0-154



- 10% increased AEP
- Improved electrical system
- Less positions needed on park level
  → less BoP/CAPEX

Radical solutions: No platform

HVAC

40%
Lower costs

OPEX/Services: Innovation

- Long-term frame agreements
- Efficient Operations
- Optimization of Processes

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Towards 2020

Key Next steps

- Cost reduction through Wind turbine innovation
- Cost reduction through Industrialization
- Cost reduction through optimized Projects execution
- Cost reduction through Foundations concept
- Cost reduction through a new Grid innovative concept

WTG ++

Foundation

Grid Connection

OPEX

AEP
(Annual Energy Production)

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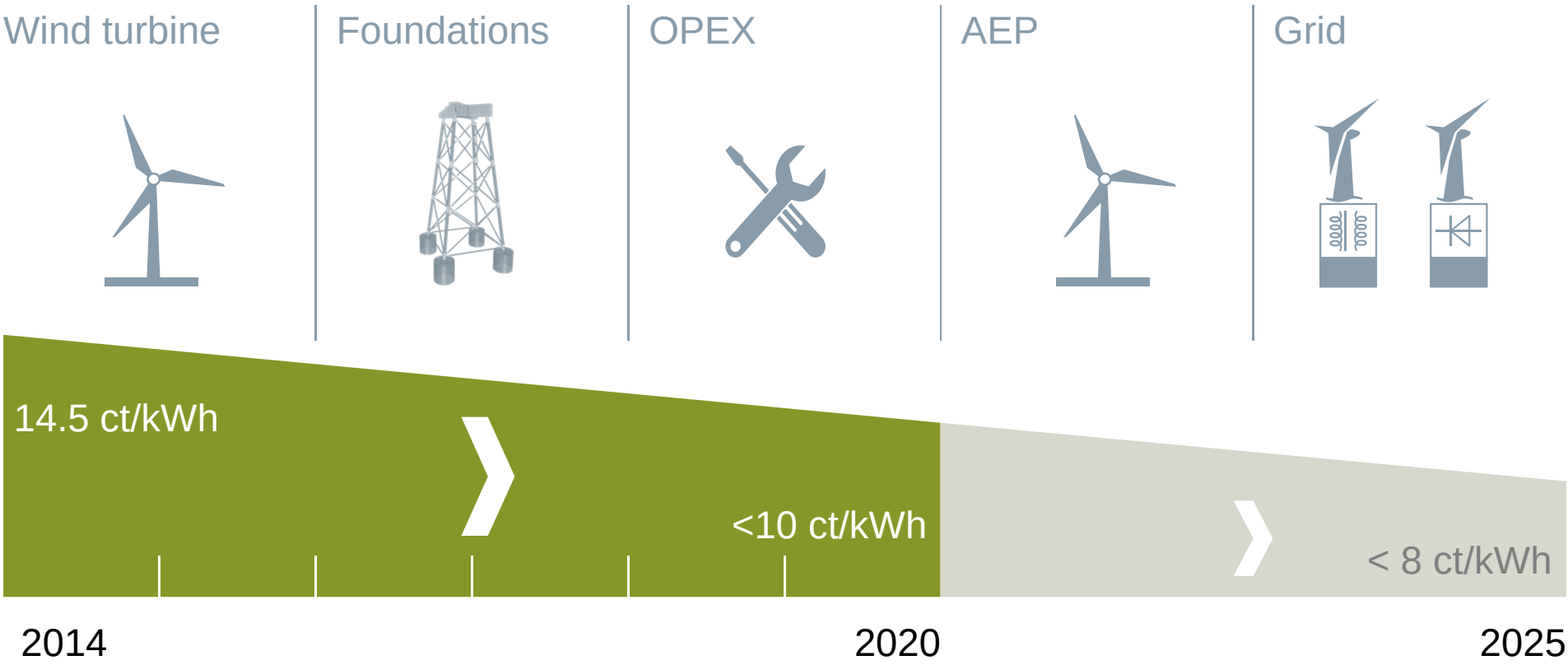
Continuous LCoE reductions beyond 2020



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