



DHL Energy Regional Conference Europe 2022

Supply chain challenges in an expanding industry

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**LOGISTICS OF
THE ENERGY
REVOLUTION**

THE FUTURE OF
THE ENERGY
SUPPLY CHAIN



**POWERING
OUR WORLD,
TOGETHER**

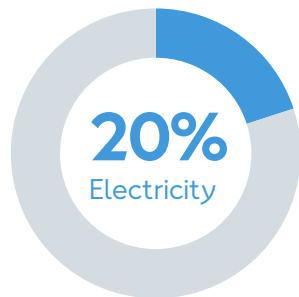
DELIVERING EXCELLENCE
TO THE ENERGY SECTOR

A large, semi-transparent image of the Earth from space, showing the Americas and parts of Europe and Africa, centered behind the title text.

Supply chain challenges in an expanding industry

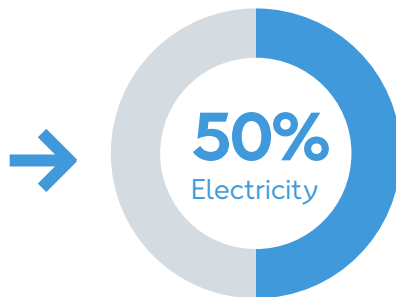
Green electrification is needed to phase out fossil fuels

Electricity share in
the energy system today

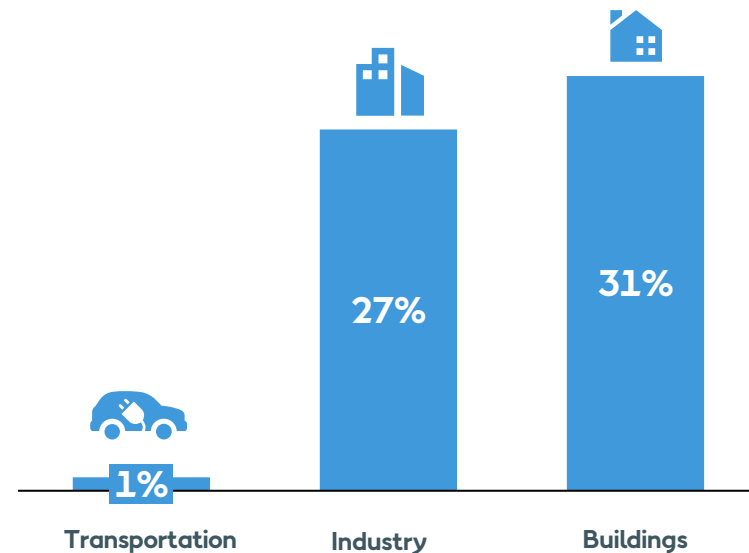


- Electricity
- Non-electric energy use

Required electricity share in 2050
to limit global warming to 1.5°C



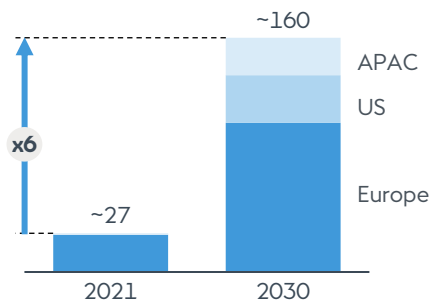
Current levels of electrification leave
room for more green electrification



Driven by falling costs, the renewable market is expected to grow massively towards 2030

Offshore wind

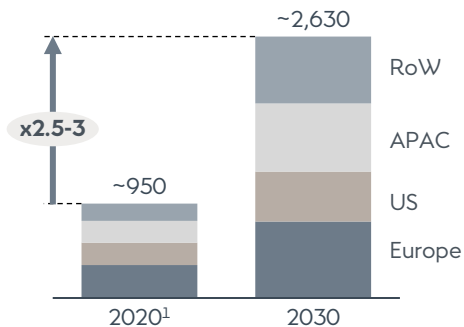
Installed capacity excl. China (GW)



- Fastest growing green technology
~20 % annual growth towards 2030
- Strong growth across all regions, with largest market in Europe and significant markets in US and APAC

Onshore renewables

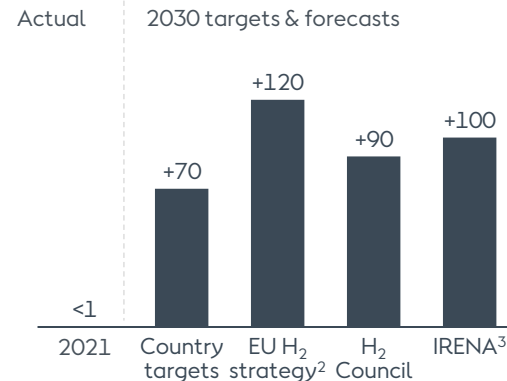
Installed capacity excl. China (GW)



- High annual growth rates in all key onshore markets
- Highest growth in APAC, while Europe will remain the largest onshore region in 2030 with ~770 GW

Renewable H₂ & green fuels

Installed electrolyser capacity (GW)



- Massive growth expected in renewable hydrogen and green fuels
- Broad range of forecasts for expected build-out towards 2030

1. BNEF expected to publish 2021 figures mid-2022

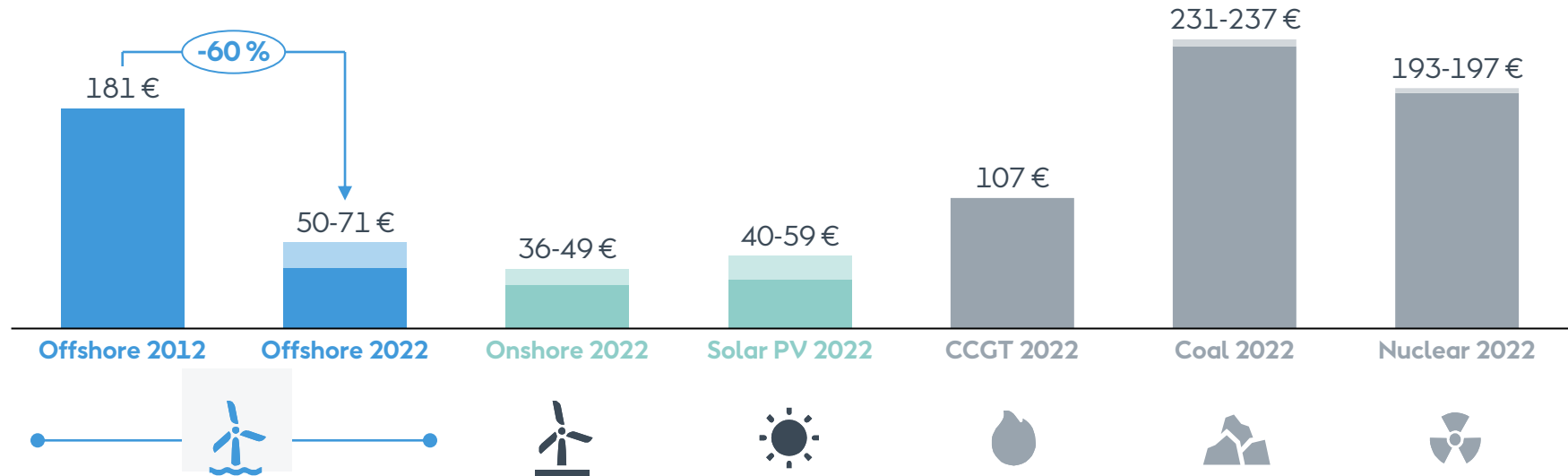
2. Electrolyser capacity based on REPowerEU target of 10 million tonnes of domestic renewable hydrogen production and 10 million tonnes of imports by 2030

3. Based on current global country H₂ targets

Today, offshore wind is fully cost-competitive with fossil fuels

Levelised Cost of Electricity (LCoE)^{1,2}

EUR/MWh, 2012 and 2022, Northwest Europe



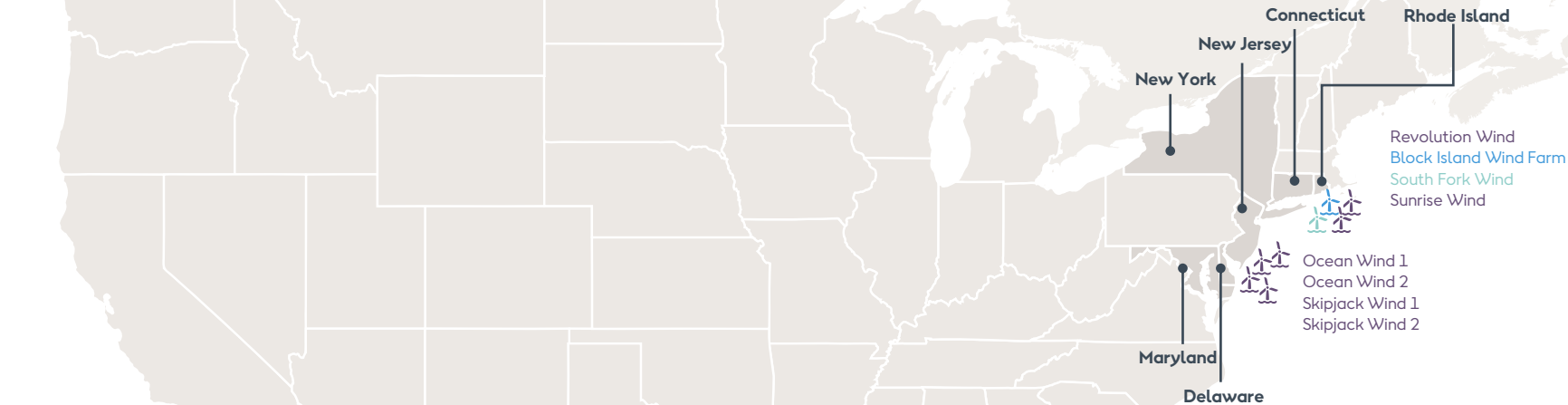
1. The chart illustrates the total span of low and mid scenarios (i.e., lowest national LCOE found in low scenario, highest national LCOE found in mid-scenario) for projects with FID today and construction beginning tomorrow. Same hurdle IRR used in low and mid scenarios. Nuclear: UK. Coal: DE. Natural gas: UK. Solar PV: DE, UK. ON wind: DE, UK. OF wind: DK, NL, UK. DE OF wind mid scenario omitted as cost of 104 EUR per MWh deemed unrepresentative. OF wind 2012: generic offshore wind, Northwest Europe, FID 2012.

5

Source: Bloomberg New Energy Finance – 1H 2022 LCOE Update.

2. CCGT and Coal LCOEs in the low and mid scenarios are calculated with BNEF's benchmark fossil fuel and carbon prices. The LCOE span could be much wider if different price scenarios were applied. Nuclear new builds in Europe has been very limited the past decades and there is a high uncertainty in construction costs that is not reflected in the nuclear LCOE span.

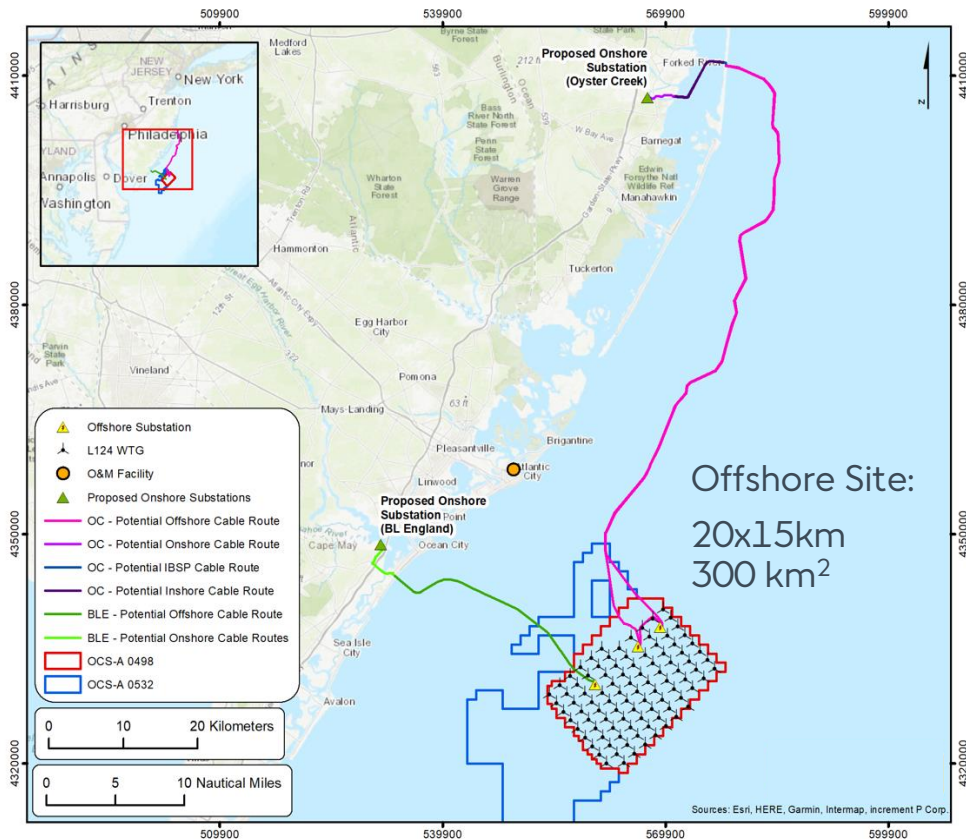
Ørsted offshore footprint in North America



Status

- In operation
- Under construction
- Under development

Ocean Wind 01 – Biggest US Offshore Windfarm



Scope



WTG

OCW01

Capacity: 1215.2 MW

Supply: 98 x 12.4 MW, 220m rotor.

Install: Single non-US flagged vessel with 2 floating feeder barges



FOU

Supply: 98 x TP-less MP + 3xOSS MP (qty 50 from Paulsboro, NJ; balance from Europe)

Install: Non-US flagged installation vessel, Jones Act barges from Paulsboro with balance fed from Europe. 0.8 x 1 nm grid layout

Local content: MP fabrication facility and 50 MP in Paulsboro, NJ



Offshore Cables

Export: 244km x 275kV + 11.5km x 275kV onshore

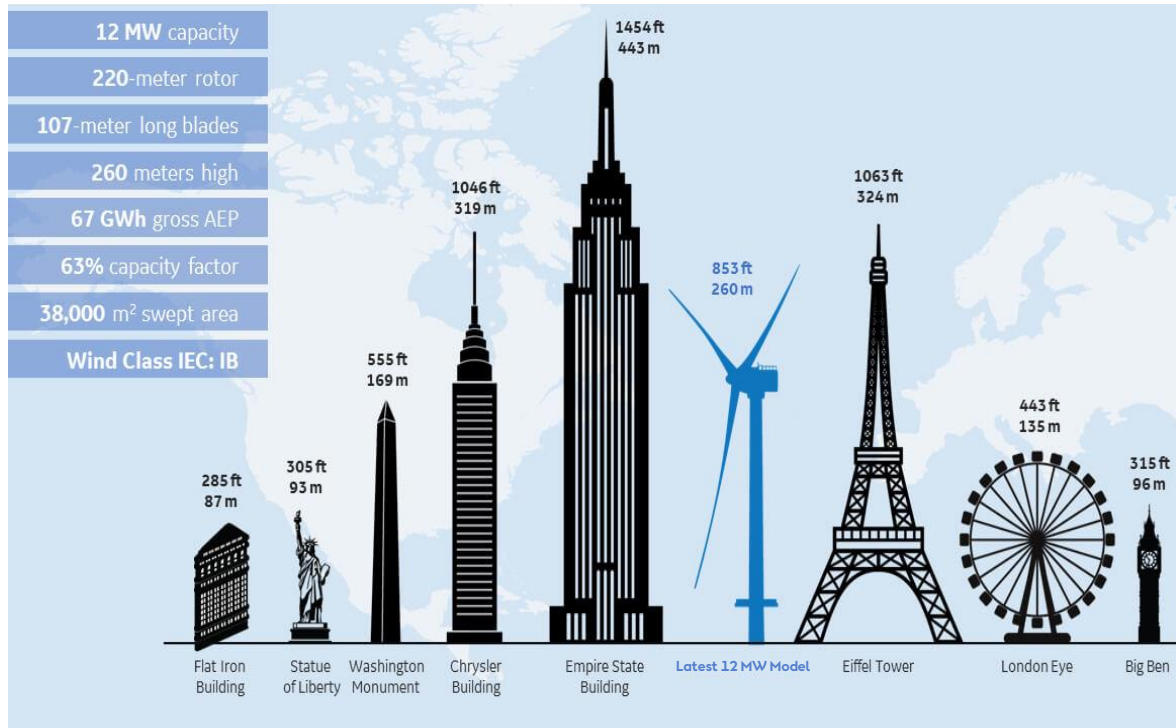
Array: 243km x 66kV – Array Interlink
275kV interlink between LKA topsides



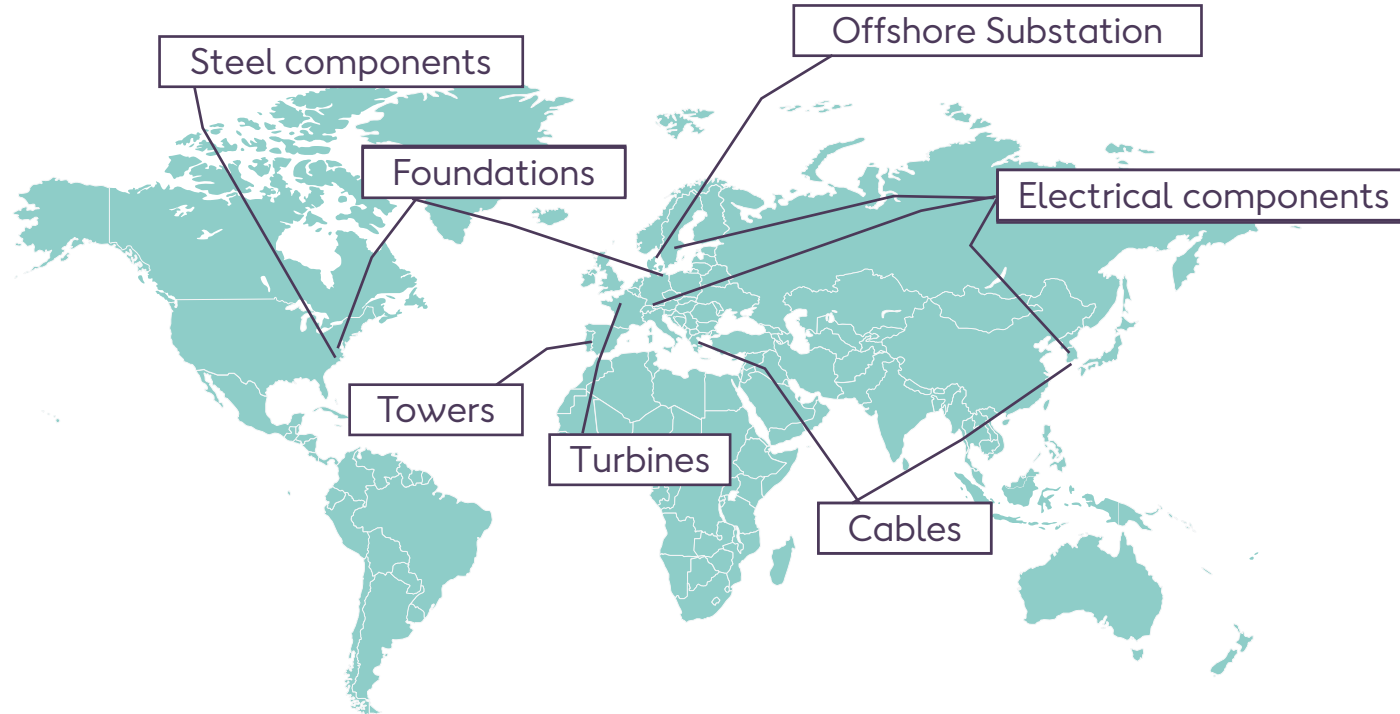
Logistics

Construction management base: Atlantic City, NJ

They are big!



A truly Global supply chain



Supply chain challenges:

- *Post Evergreen in the Suez*
- *Post COVID-19*
- *Post Start of Ukraine War*

- Increase in pricing
- Force majeure claims
- Shortage of specific raw materials
- Wild political ambitions on Renewable energy
- Cabotage laws (Jones Act, dredging act etc..)
- Scarcity of installation vessels

Price



Denmark establishes new international alliance on offshore wind

On Monday 19 September, the Global Offshore Wind and ambitions to a wider group of international states a new international alliance comprising of governments international offshore wind 2050.

Aluminium



Kobber



Neodym



Mitigation efforts

- Secure raw material and fabrication capacity
- Turbine framework agreements
- Transport & Logistics

DILLINGER



A low-angle photograph of a person holding a young child up in the air. They are flying a colorful kite with a long yellow tail against a clear, bright blue sky. The kite is positioned in the upper left quadrant, and its string extends diagonally across the frame. The person and child are in the lower right corner, looking up at the kite. The overall mood is hopeful and aspirational.

Let's create a world
that runs entirely
on green energy



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