

Biofuels at Ørsted

- Future of Biofuels 2023

Topics

- Ørsted A/S - Awarded World most sustainable electric utility for 2023 by Corporate Knights ¹
- The role of fuels at Ørsted
- The circular renewable fuels at Ørsted



- Mika Torsten Bärlund
- Category Manager - Offshore Logistics - Fuels

² ¹) <https://www.corporateknights.com/rankings/global-100-rankings/2021-global-100-rankings/2021-global-100-ranking/>

Ørsted develops energy systems that are green, independent and economically viable

■ Installed ■ Under construction

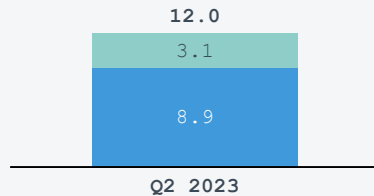


Offshore wind



- Global leader in offshore wind
- Develop, construct, operate and own offshore wind farms
- Ambition to reach ~30 GW installed capacity by 2030

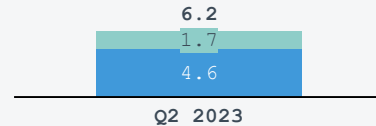
Capacity, GW



Onshore renewables



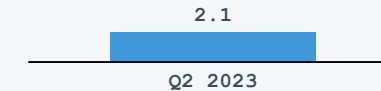
- Strong presence in the United States and Europe
- Develop, operate and own onshore wind, solar PV and storage projects
- Ambition to reach ~17.5 GW installed capacity by 2030



Bioenergy & other



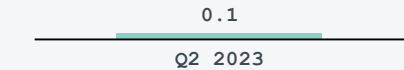
- Presence in Europe, including bioenergy plants, legacy gas activities and patented waste-to-energy technology
- Own and operate bioenergy and waste-to-energy plants, and optimise gas portfolio



Renewable hydrogen and green fuels



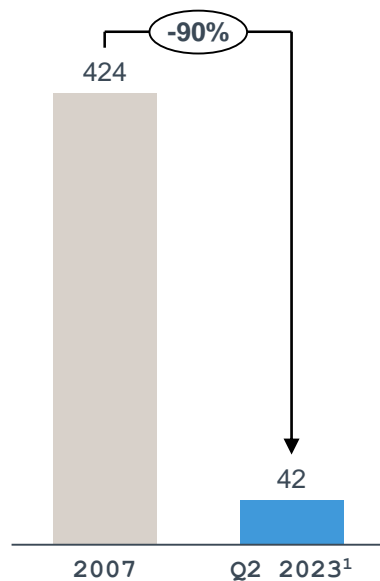
- Emerging platform with 10 pipeline projects (+3 GW) mainly in Europe
- Develop, construct, own and operate hydrogen facilities
- Ambition to become a global leader in renewable hydrogen and green fuels by 2030



We have succeeded in profoundly transforming Ørsted

CO₂ reduction

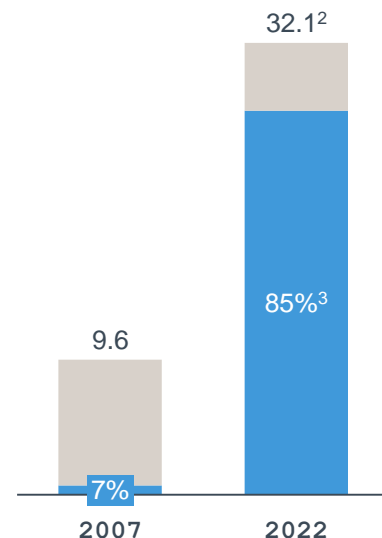
g CO₂e/kWh (scope 1 & 2)



Green transformation

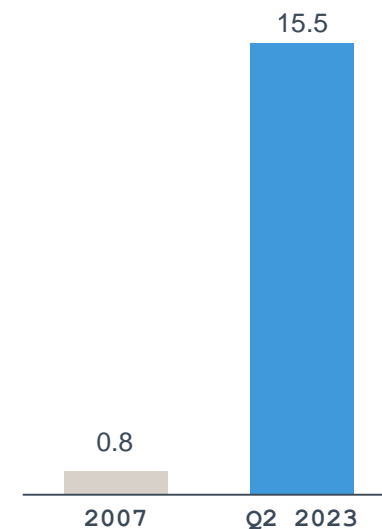
EBITDA, DKKbn, %

■ Share of renewables



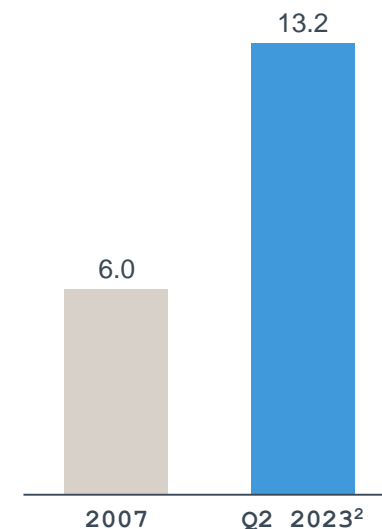
Renewable capacity

Installed capacity, GW



Profitability

ROCE, %



Notes: 1. Year to date. 2. Including EBITDA from new partnerships

3. Taxonomy-aligned

Source: Ørsted Interim Report Q2 2023

2030 aspiration

Become the
world's
leading
green energy
major

The five pillars to achieving our 2030 aspiration



One of the world's largest **green electricity producers**

- Global no. 1 in offshore
- Significant regional player in onshore renewables
- A market shaper and significant regional player in P2X



One of the world's largest and most value-creating **deployers of capital** into the green transformation



The world's **leading talent platform** in renewable energy



A **globally recognised sustainability leader**



A core contributor and **catalyst for change** towards a world running entirely on green energy

We have industry leading sustainability ambitions and actions



Science-aligned climate action **2025**

98% reduction in emissions intensity¹



SCIENCE
BASED
TARGETS

2040 Net-zero value chain²

Green energy that revives nature **2030**

No later than 2030, all new renewable energy projects commissioned must have net-positive biodiversity impact
Zero wind turbine blades to landfill
Zero solar panels to landfill



WWF

Today



The Nature
Conservancy

A green transformation that works for people **2030**

40-60 gender balance in our total workforce and among people leaders (women:men)

Governance that enables the right decisions **Today**

We exclusively deploy green and sustainable long-term financing, and all projects are taxonomy-aligned

Notes: 1. Scope 1-2 emissions (CO₂e/kWh) from a 2006 base year. 2. Scope 1-3 emissions. See full overview of Ørsted's science-based targets in our annual report.

Our growth platform



Strategic choices

- Maintain global offshore leadership across Europe, Americas, and APAC
 - Bid selectively and deselect opportunities where value is not sufficient, as demonstrated by deselecting auctions in Massachusetts, Taiwan, and markets in France, Vietnam, etc.
 - Build strong opportunity pipeline in selected markets, including floating opportunity pipeline in Norway, UK, and Iberia
 - Target high-growth onshore markets in the US and Europe to tap into the massive growth opportunities
 - Leverage deep regional market expertise and capabilities across the organisation to deliver customer solutions
 - Diversify earnings given complementarity to offshore on load distributions and shorter timeline from CAPEX to COD
-
- Shape the P2X market and position ourselves to take advantage of demand at scale later in the decade
 - Focus on production hubs in Europe and the US to become a significant regional player
 - Delivery focus in the short to medium term on e-methanol and renewable hydrogen with late decade e-ammonia opportunities in portfolio

Notes: 1. Scope 1-2 emissions (CO₂e/kWh) from a 2006 base year. 2. Scope 1-3 emissions. See full overview of Ørsted's science-based targets in our annual report.

Transport modes within Ørsted Offshore Windpower - Influencing for a sustainable future fuel

Support Operation Vessel

Marine Gas Oil

> 30.000 Tonnes per Year



Construction Vessels

Marine Gas Oil

> 300.000 Tonnes per Year*



Helicopter

Jet Fuel A1

> 1.000 Tonnes per Year



Crew Transport Vessel

Marine Gas Oil

> 20.000 Tonnes per Year



Sustainability Criteria's for Biofuel - Established in 2020

- Cornerstone in biofuel strategy to support carbon neutral target for scope 1-2
- Provide guidance in Planning and Sourcing
- Support decision-making

Requirement	Detailed criteria & non-binding preferences
1. Documentation	<ul style="list-style-type: none">• Biofuel sustainability must be documented through 3rd party certification schemes
2. Certification schemes	<ul style="list-style-type: none">• Accept certification schemes that become approved by EU RED II (In interim: ISCC, Redcert, RSB)• <i>Preference</i> for RSB certification
3. Proof of GHG savings	<ul style="list-style-type: none">• Require at least 50 % GHG savings in lifecycle perspective relative to fossil fuel• <i>Preference</i> for 80 % GHG savings or higher
4. No high risk feedstocks	<ul style="list-style-type: none">• Do not accept palm and soy as feedstock (incl. co-products & residues)
5. No crop feedstocks	<ul style="list-style-type: none">• Do not accept any food crops, feed crops, or land-based energy crops as feedstock• Accept used cooking-oil and animal fat• <i>Preference</i> for "advanced biofuels" (Part A of Annex IX, EU RED II)
6. Accept that physical delivery can be a mix of various biofuels and/or fossil fuel	<ul style="list-style-type: none">• Accept 'mass-balance' bookkeeping approach, which is the pragmatic solution in today's market• <i>Preference</i> for 'physical segregation'

Future fuel considerations



Electrification

- *Class acceptance of battery technology*



HVO

- *Cost - will it ever be competitive*



Hydrogen

- *Proven technology for suitable vessels*



Methanol

- *Limited availability of e-fuels*



Ammonia

- *Limited availability of e-fuels, Safety &*

Technology



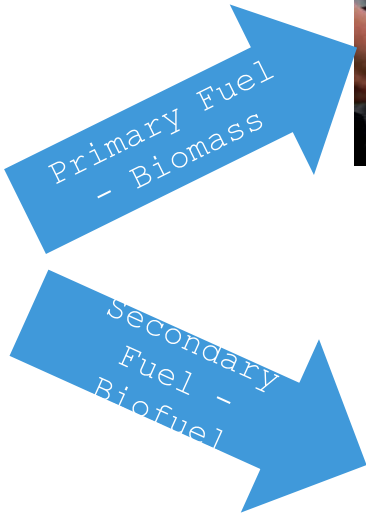
SAF

- *Logistics constrains*



Bioenergy – Avedøre Power Station

- A multifuel user



Straw



Chips



Pellets



- *Turbines & Equipment*
- *Price*

Circularity for e-fuels

- Ørsted will produce, make available and use e-fuels

1. Renewable Power Generation



2. P2X



3. E-fuels for vessels

Our vision

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

