

Biomethane Market in Denmark

UK Biomethane Day 2018
Birmingham, 2nd May 2018

Orsted

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

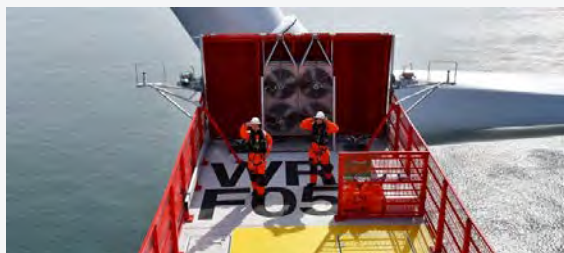


- Revenue (2017): DKK 59.5bn
- EBITDA (2017): DKK 22.5bn
- ~5,600 employees
- Active in Scandinavia, United Kingdom, Germany, The Netherlands, USA and Taiwan

Major Shareholder:

- Danish State 50.1%

Wind Power



- Global leader in offshore wind
- Ambition of 11-12 GW installed offshore wind capacity by 2025

Distribution & Customer Solutions



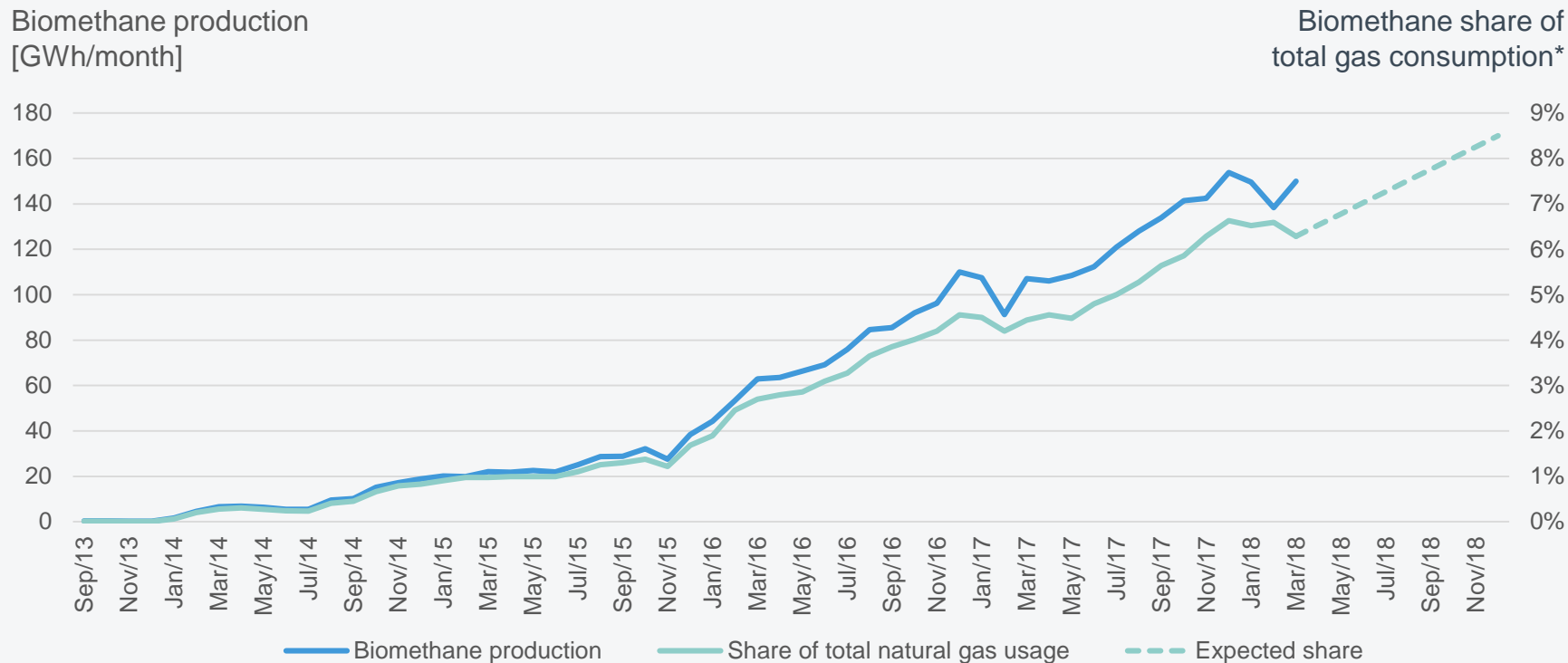
- Largest power distributor in Denmark with 1 mill. customers
- Developing green, innovative and cost efficient customer solutions

Bioenergy & Thermal Power



- #1 in Danish heat and power generation with 25% of market
- Converting heat and power plants from coal and gas to biomass

Biomethane production has grown steadily and covers more than 6% of natural gas consumption in Denmark



TWh: Lower heating value

* Gas consumption reference is 12-monthly moving average for daily consumption

Concrete political targets for energy system have driven the growth in biomethane production since the introduction of biomethane subsidies in 2013

Production subsidies

As a part of the Danish Energy Act of 18th June 2012, the vast majority of the Danish parliament decided to

- Increase the subsidy for power production, and subsidise new areas of biogas utilization including biomethane

Subsidies approved by European Commission in Dec. 2013

The subsidy is conditional on limitations in use of energy crops as a maximum share of the total biomass input (weight basis)

- 2015-2017: Max 25%
- 2018-2020: Max 12%
- 2021- Limit to be reviewed

Investment subsidies

Rural district funding program

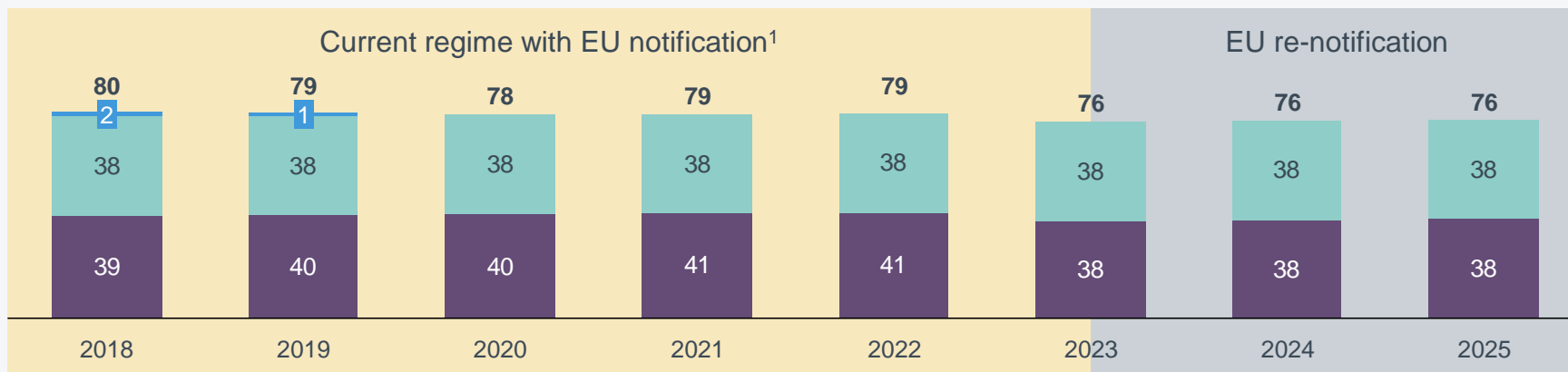
- 40 million € has been granted to 14 projects
- Up to 30% of investments has been granted
- The program was closed in 2012 and is not expected to be repeated

Energy efficiency program

- The energy production from so-called farm based biogas plants is considered as energy reductions
- The program is closed

Current subsidies for bio-methane hedge gas market exposure – reductions from 2023

Total value of biogas (subsidy and gas market price) is appr. 80 EUR/MWh declining to 76 EUR/MWh in 2023 (Nominal prices)



Subsidy for bio-methane is divided in three elements

- 1st element** Indexed with 60% of inflation
 Lowered by 3.4 EUR/MWh (2016 prices) in 2023

- 2nd element** Subsidy + last years gas price = 38.2 EUR/MWh² (CFD³)





- 3rd element** Phased out from 2016-2020 with 0.97 EUR/MWh reduction per year

1 Current notification valid to 30 November 2023

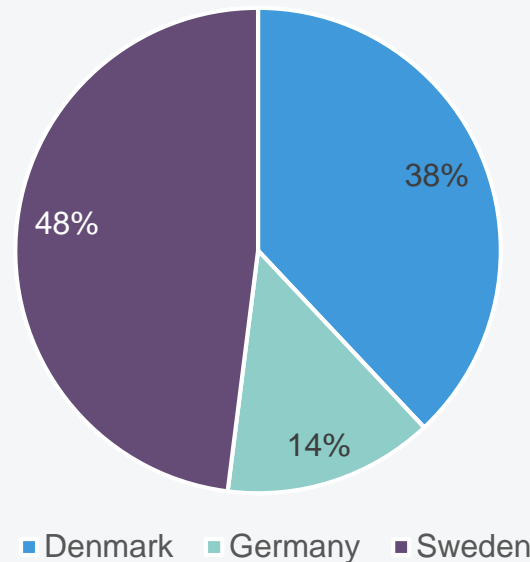
2 Actual sum of subsidy and gas market price will vary from year to year due to time lag effect of annual subsidy regulation

3 Contract For Difference = Difference between market price and agreed price

Four players dominate the Danish biomethane market across production and trading – large quantities are exported to other markets

	Biomethane production	Biomethane trading
	✓	✓
	✓	✓
	✓	✓
		✓

Biogas certificates are sold in Denmark and neighboring markets*



The future of biogas is uncertain and relies on political decisions but continued support and growth is expected

Broad political support for biogas – but focus on the increasing subsidy costs



Variations in political ambitions

- E.g. 50% biomethane share in 2030?
- Growth of 0.5-1 TWh/year?



Increased preference for biomethane over power production

- Alternative renewable power production technologies (wind, solar) are more cost effective and require lower subsidies
- Storability and utilisation flexibility is prioritised



Focus on subsidy levels

- Biogas subsidies are discussed critically
- Swedish government is concerned about the competition from Danish biomethane producers

Subsidy reductions are indicated by the Danish government for both existing and new biogas plants



Process

- Government is preparing a general review of energy policy and in that context reductions in biogas subsidies are expected
- Political negotiations expected in Q2 2018



Existing plants

- Over-compensation rules can potentially lead to subsidy reductions



New plants

- Increased state budget certainty by introducing either tender process and/or subsidy pools
- Change from CFD to fixed add-on to gas market price
- Generally the government wishes to reduce subsidy costs

Thank you for your attention

