



# **Gas Turbine Fleet Net-Zero Carbon Strategy**

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October 2021

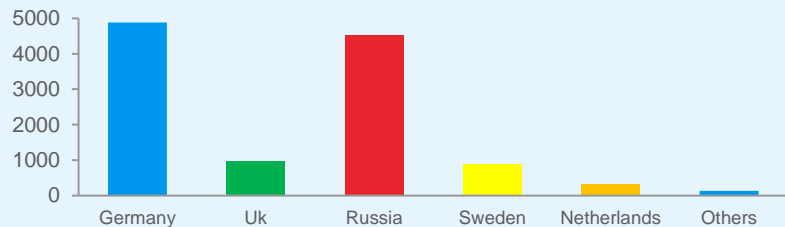
# Agenda

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- 1 Company Introduction
  - 2 Gas Turbine Fleet Description
  - 3 Our Gas Turbine Fleet Net Zero Journey
  - 4 Project Goals
  - 5 Progress to Date and Route Ahead
  - 7 Biofuel Pilot in Malmö
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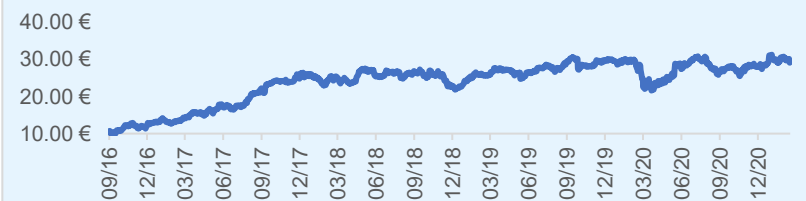
# We are Uniper

- Uniper is an international energy company with approximately 12,000 employees and operations in more than 40 countries.
- We operate in our core European markets and in selected markets worldwide.
- Our portfolio comprises industrial-scale plants, trading activities and service provision.
- We stand for a reliable supply of energy.
- Since September 2016, Uniper has been listed on the stock exchange and represented in the MDAX and MSCI-Germany.

## Employees<sup>1</sup>



## Share price development



# Uniper at a Glance

## Our operations

- Power Generation
- Commodity Trading
- Energy Sales
- Energy Services
- Growth areas: Hydrogen, Renewables

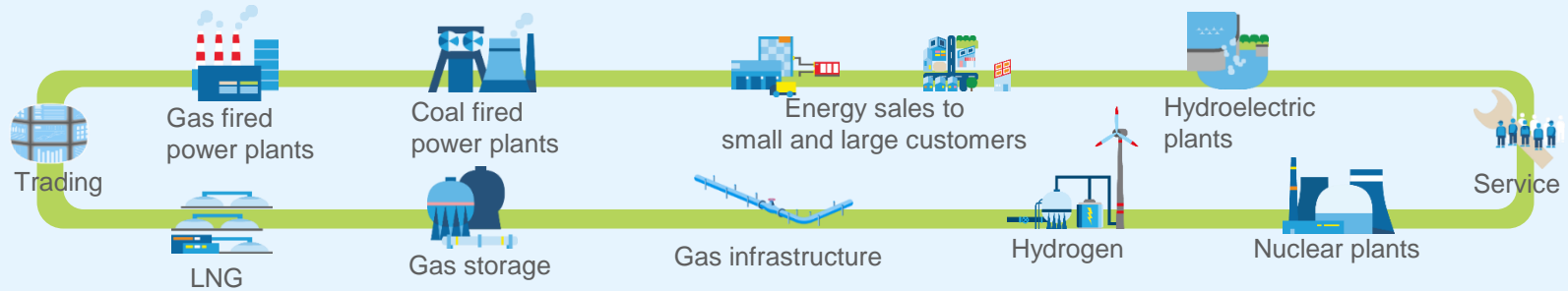


€ 998 mln.  
Adj. EBIT<sup>1</sup>

~35 GW  
Generation capacity<sup>1</sup>

100 years  
Experience

€ 774 mln.  
Adj. Net Income<sup>1</sup>



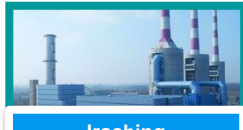
# Gas Fleet of 9 GW over 17 sites in 5 countries



**Connah's Quay**  
4 x GE 9FA



**RoCa**  
2 x GE Frame 5



**Irsching**  
2x SGT5-5000F  
1 x SGT5 – 8000H



**Killingholme**  
2 x SGT V94.2A



**Karlshamm**  
1 x RR (GEC)



**OVT**  
1 x GE 9FB



**The Hague**  
2 x GE LM6000 DLE



**Franken**  
1 x SGT V93.1



**Gonyu**  
1 x SGT5 4000F



**Taylors Lane**  
8 x RR



**Grain**  
3 x Alstom GT26



**Leiden**  
2 x GE LM2500



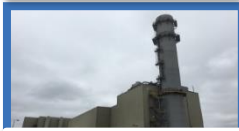
**Kirchmöser**  
2 x Siemens V64.3



**CDC**  
1 x SGT V94.3A



**Enfield**  
1 x Alstom GT26



**Halmstad**  
1 x Siemens 2000E

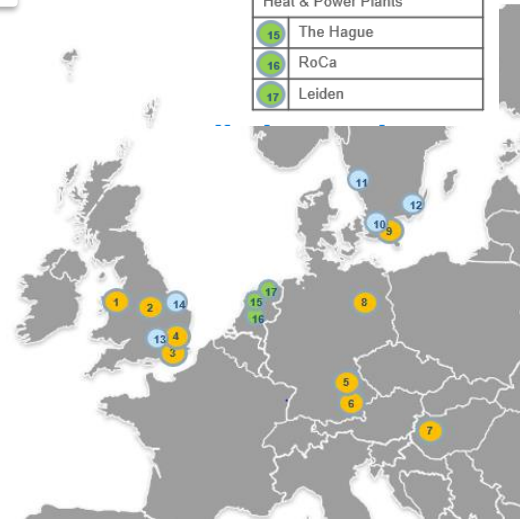


**Barsebäck**  
2 x Siemens PP4



**Barsebäck**  
2 x Siemens PP4

Combined Cycle GT Plants	
1	Connahs Quay
2	CDC
3	Grain
4	Enfield
5	Franken
6	Irsching
7	Gönyü
8	Kirchmoser
9	Öresundsverket
Open Cycle Plants	
10	Barseback
11	Halmstad
12	Karlshamm
13	Taylors Lane
14	Killingholme
Heat & Power Plants	
15	The Hague
16	RoCa
17	Leiden



# Our Gas Turbine Fleet Net Zero Journey

**2019**

GT Fleet Vision



*"We excel at what we do!  
Making a carbon neutral future possible!"*

**2020 Q1**

Uniper Strategy



**2021 – 2022**

Fleetwide assessment,  
Strategic Decisions,  
Demonstrations / pilot,  
GTF Decarbonisation plans



Socio-economic  
landscape



Technologies



Uniper Assets

**2019 Q4 – 2020 Q2**

Making Net Zero Possible  
Phase 1



Making  
Net Zero  
Possible



Cross Functional Team  
Asset Operations  
Asset Management  
Engineering

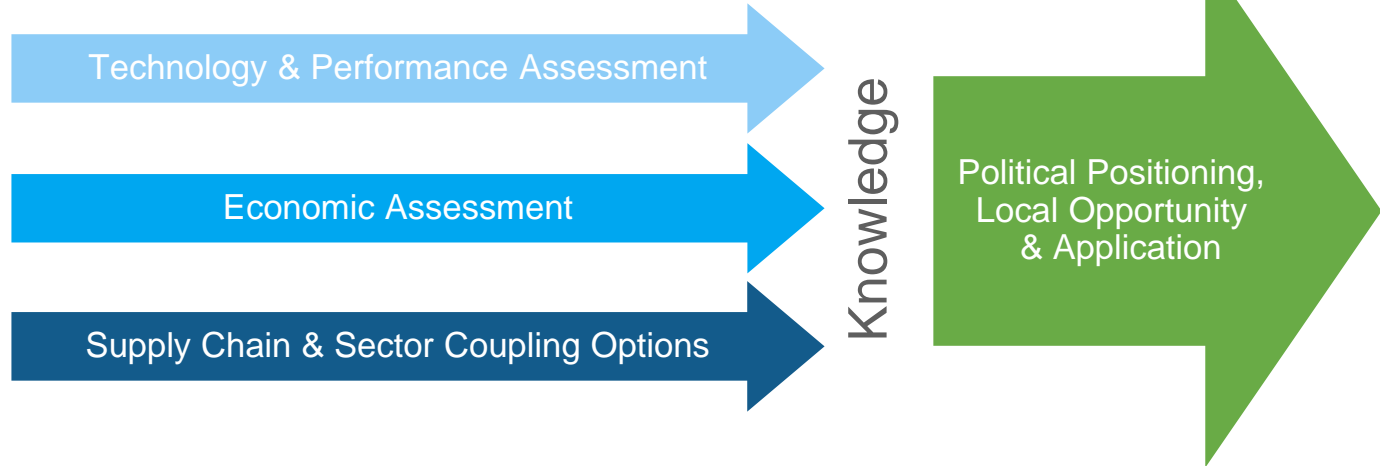
**2020 Q2+**

MNZP Phase 2  
Lead site studies

# The Project goals for each technology are similar: Building knowledge to shape/seize local opportunities



*Question is one of Feasibility vs Viability*



# Making Net Zero Possible: GT Fleet Route to Decarbonisation

Today

## Making Net Zero Possible

*“Assessment of decarb options provides the foundation for the future”*

- GT Fleet Vision & Uniper strategy set clear mandate to decarbonize



- Three technologies being pursued as decarbonization solutions:  
Carbon capture, hydrogen & biofuels



2022+

## Making Net Zero Probable

*“Pilots & Early Adopters for Implementation”*

- Acceleration phase towards practical applications in real world environments.



- Pilot plants validate solutions, and funding available for early-movers

2025-2035

## Making Net Zero Profitable

*“Decarbonization delivery”*

- Net Zero in European Power Generation by 2035

# Net Zero

- Decarbonization plans developed and in implementation / operation.



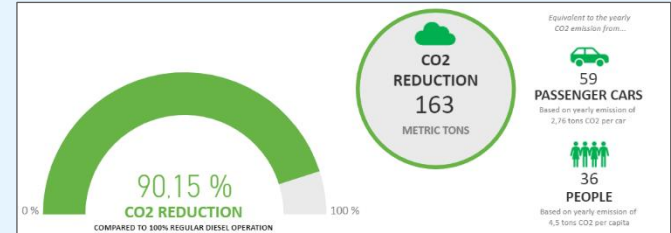
# Pilot in Malmö (Siemens V93.0) Gas Turbine

## 'First of a Kind' Biofuel Pilot

- Performance and Feasibility study completed in MNZP-Phase 1
- Selected Biofuel fulfills most of the Malmö GT Fuel Specifications
  - Suitable for existing diesel storage infrastructure
  - No need to clean out existing fossil diesel residues
  - Suitable for cold climates too (does NOT require heated storage)
  - Sustainable fuel (100% renewable raw materials)

- Successful trial demonstrated operation on 100% biofuel
- 3-day trial included:
  - **Day I:** Start-up and ramp-up to base load, part load, and then full load on Conventional Fuel Oil
  - **Day II:** Start-up and ramp-up to base load, part load, and then full load on biofuel
  - **Day III:** Switching back to Fuel Oil for start-up and ramp-up to base load
- Performance and Emissions data measurement for Post-trial analysis

## Very positive results from test



*Timescale: July 26<sup>th</sup> – July 28<sup>th</sup>, 2021*

- ✓ No risks or non-conformances identified during the Pilot
- ✓ Next steps: Complete data analysis and reporting on findings
- ✓ Received Sustainability Certificate: Raw materials used complies the sustainability criteria (RED-II)