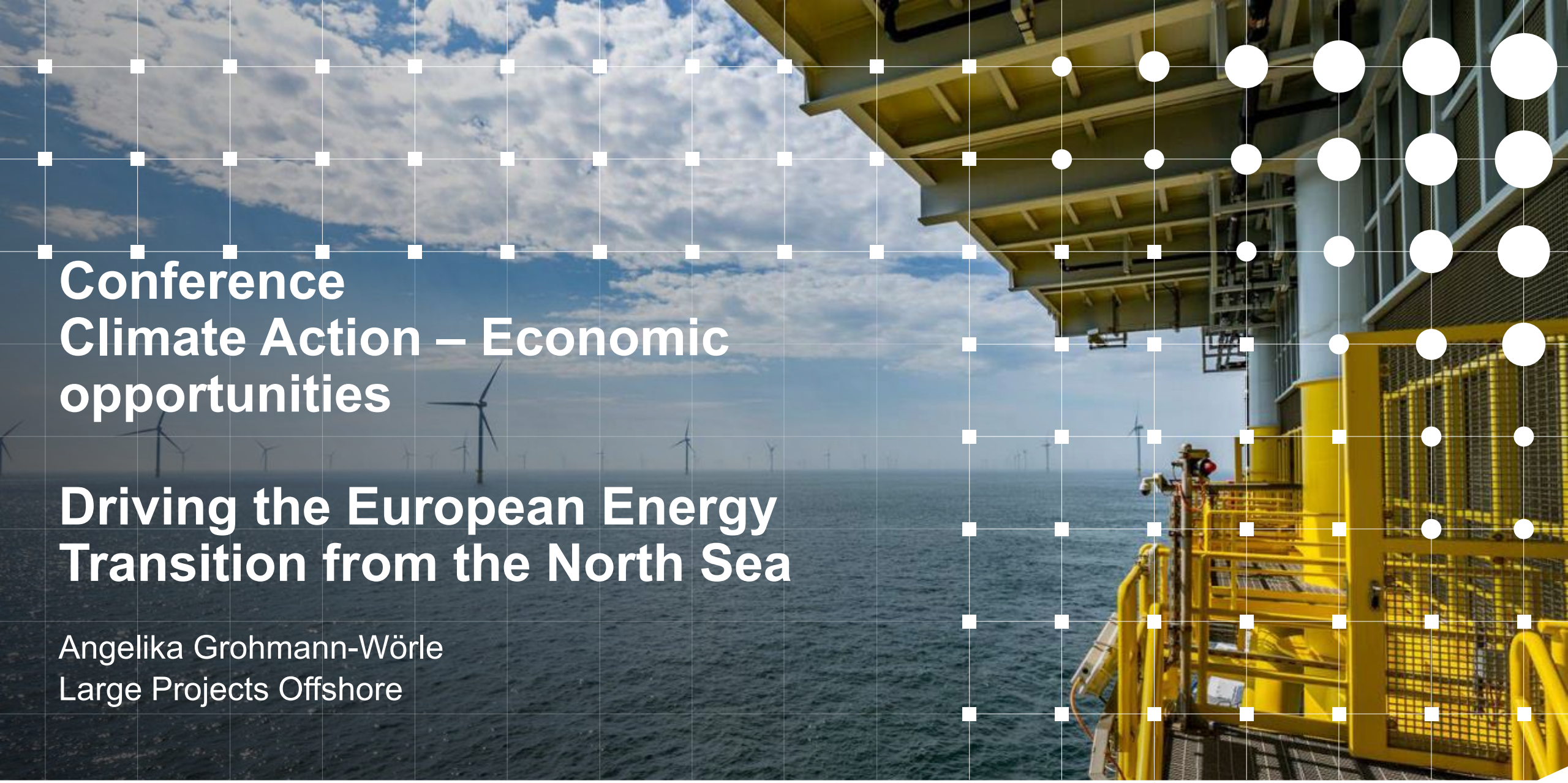


Conference Climate Action – Economic opportunities

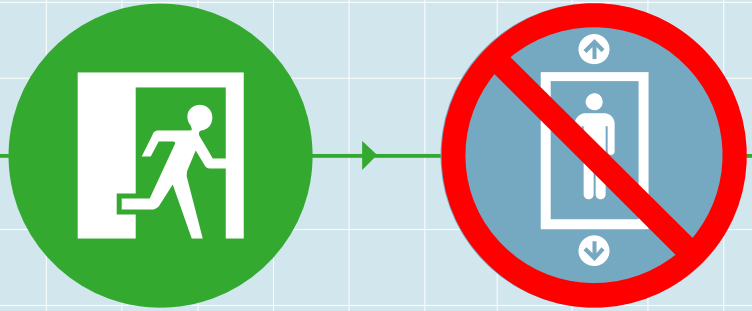
Driving the European Energy Transition from the North Sea

Angelika Grohmann-Wörle
Large Projects Offshore

A moment for safety

Together we provide a safe working environment. We learn from mistakes and sharing ideas, concerns and asking questions are a matter of course.

We also draw attention to the following safety measures in case of evacuation of the premises



Follow the escape route as indicated

Use the stairs instead of the lift

Go to the assembly point

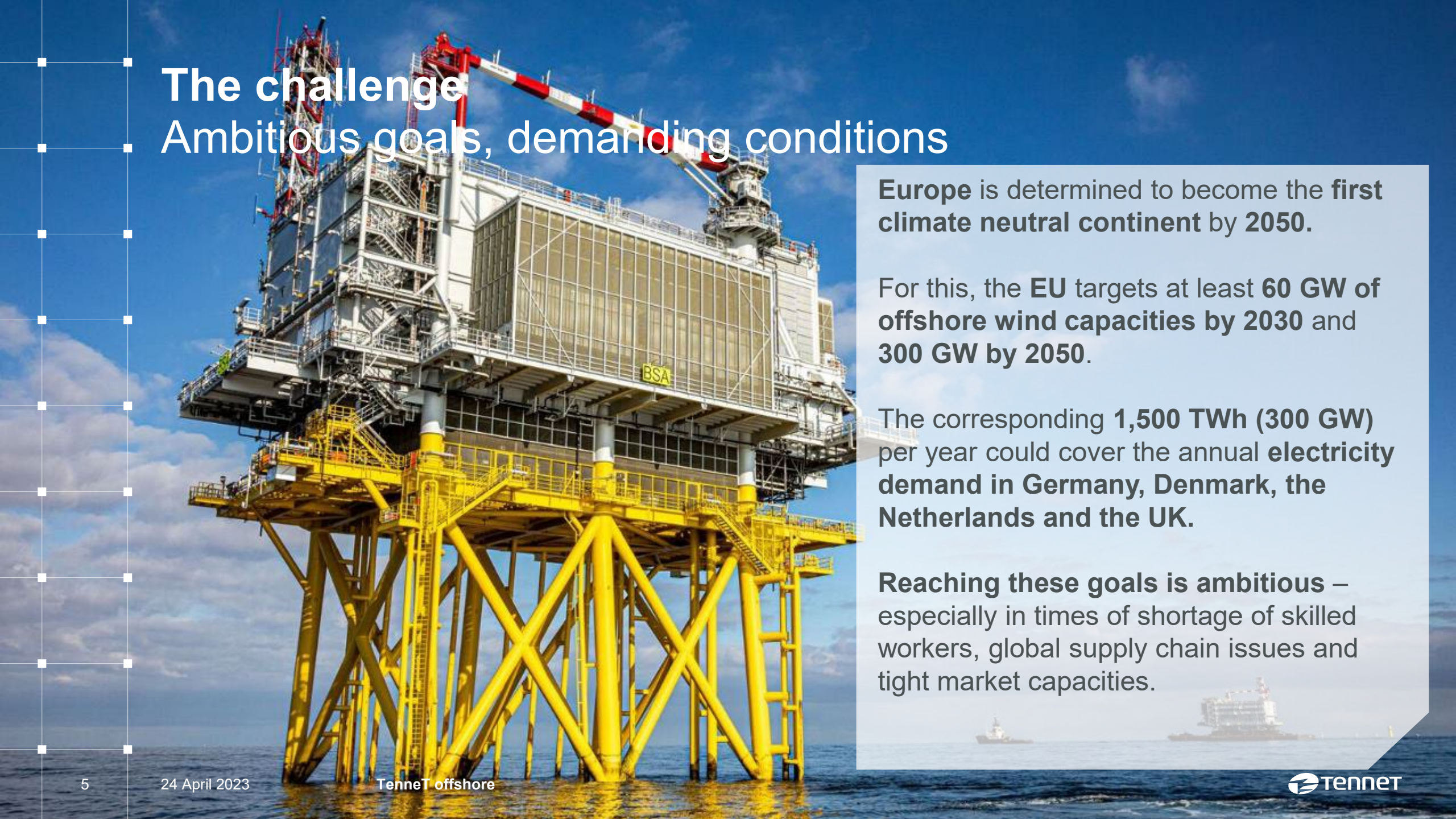
Follow the instructions of the in-company emergency responder

Agenda
Name event

1. Our mission – our challenge
2. Our role
3. Our approach
6. Our expertise
5. Our responsibility

Our mission – our challenge

The challenge
Ambitious goals, demanding conditions



Europe is determined to become the **first climate neutral continent** by **2050.**

For this, the **EU** targets at least **60 GW of offshore wind capacities by 2030** and **300 GW by 2050**.

The corresponding **1,500 TWh (300 GW)** per year could cover the annual **electricity demand in Germany, Denmark, the Netherlands and the UK.**

Reaching these goals is ambitious – especially in times of shortage of skilled workers, global supply chain issues and tight market capacities.

The vision
Shaping the future energy landscape

To **deliver on the 65 GW goal from the Esbjerg Declaration**, we will invest more than **€40 billion** for connections of our latest offshore standard**,** making us one of the largest investors in Europe's path to a green energy future.

With this investment, we will have connected **43.8 GW of offshore wind energy capacity** in the Netherlands and Germany by 2031.

Our role

TenneT offshore at glance (2023)

Making clean wind energy from the North Sea a reality

10,6 GW
Combined transmission capacity of offshore grid connection systems

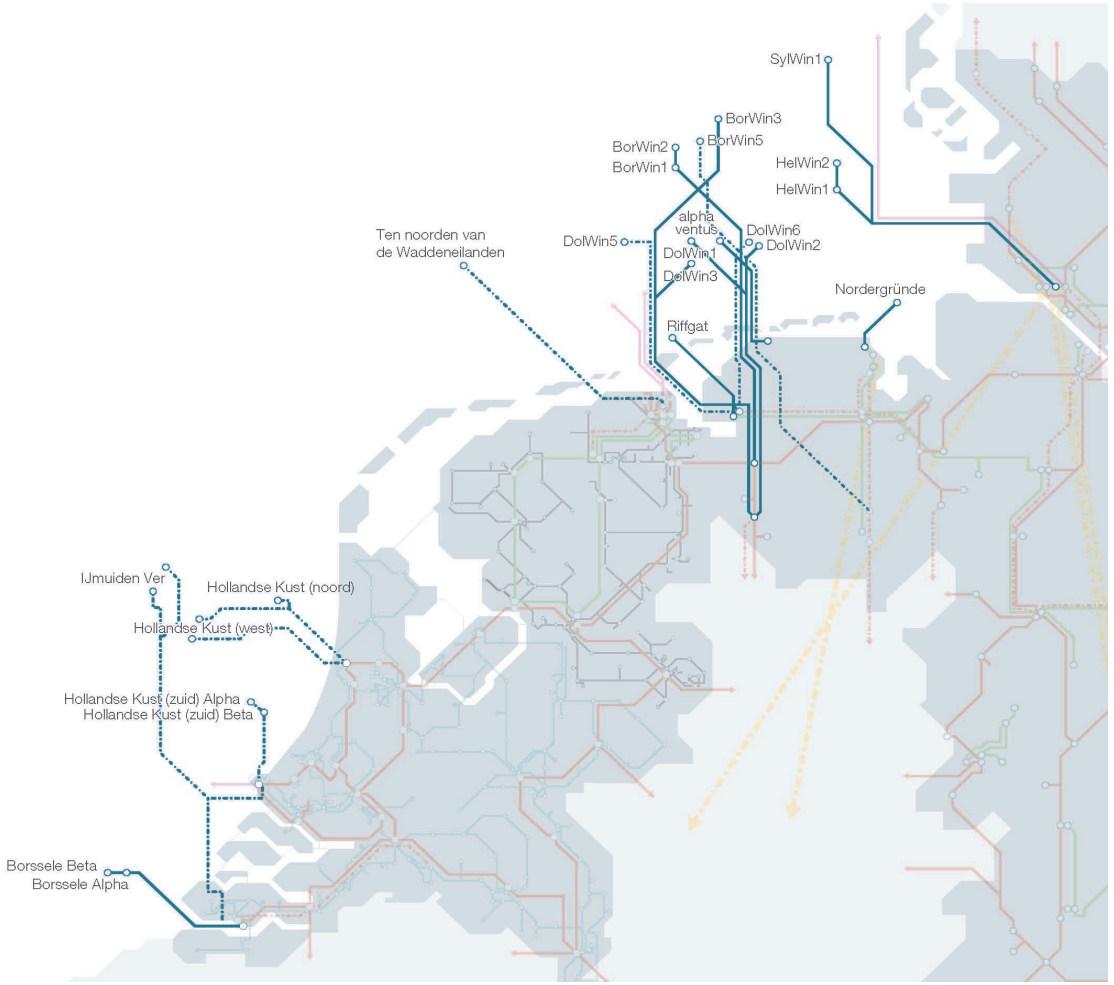
4
interconnectors

total cable system length
3,600 km

17 offshore
grid connections

29 TWh
transmission of offshore wind energy

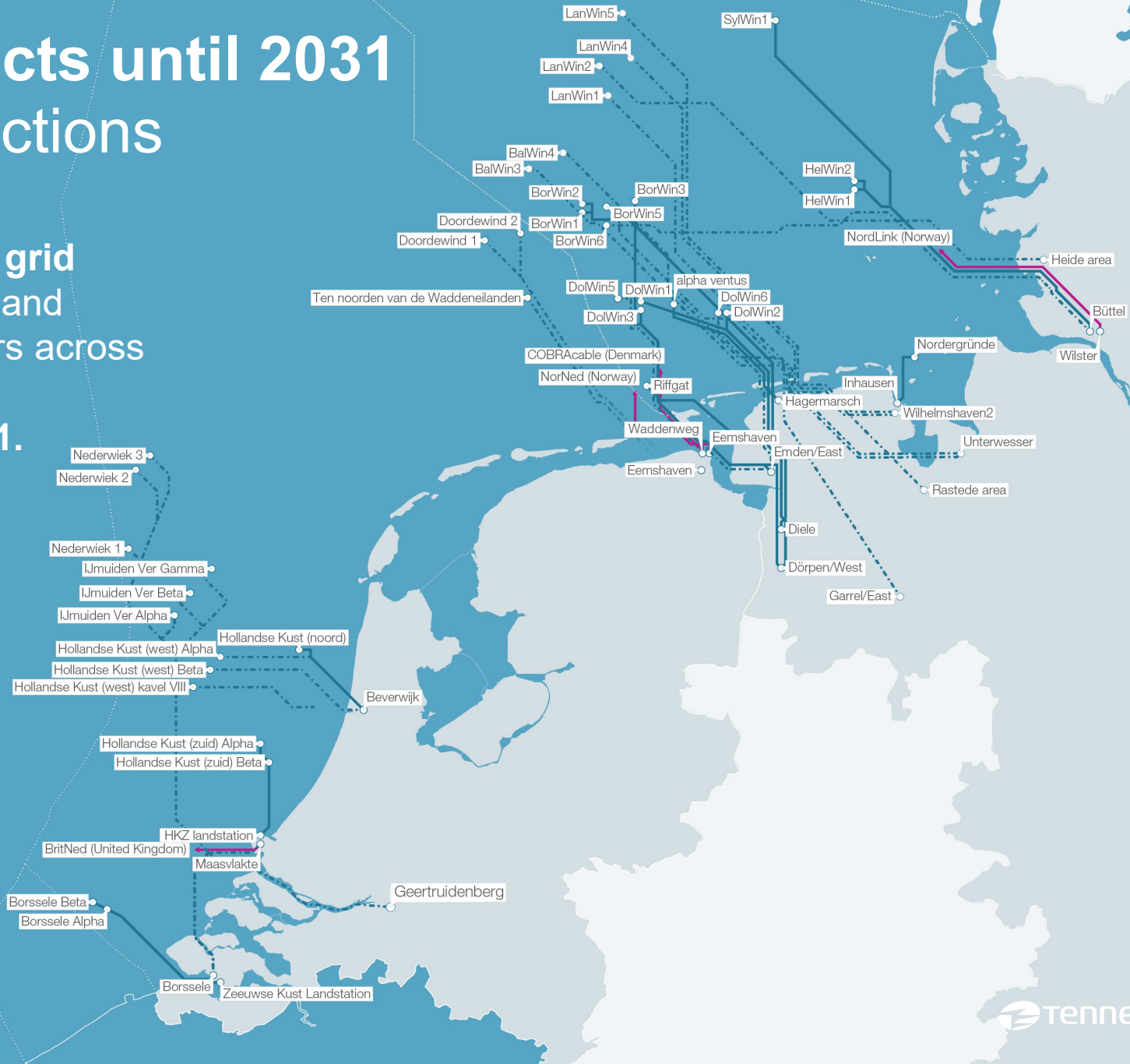
Length up to
205 km
per connection



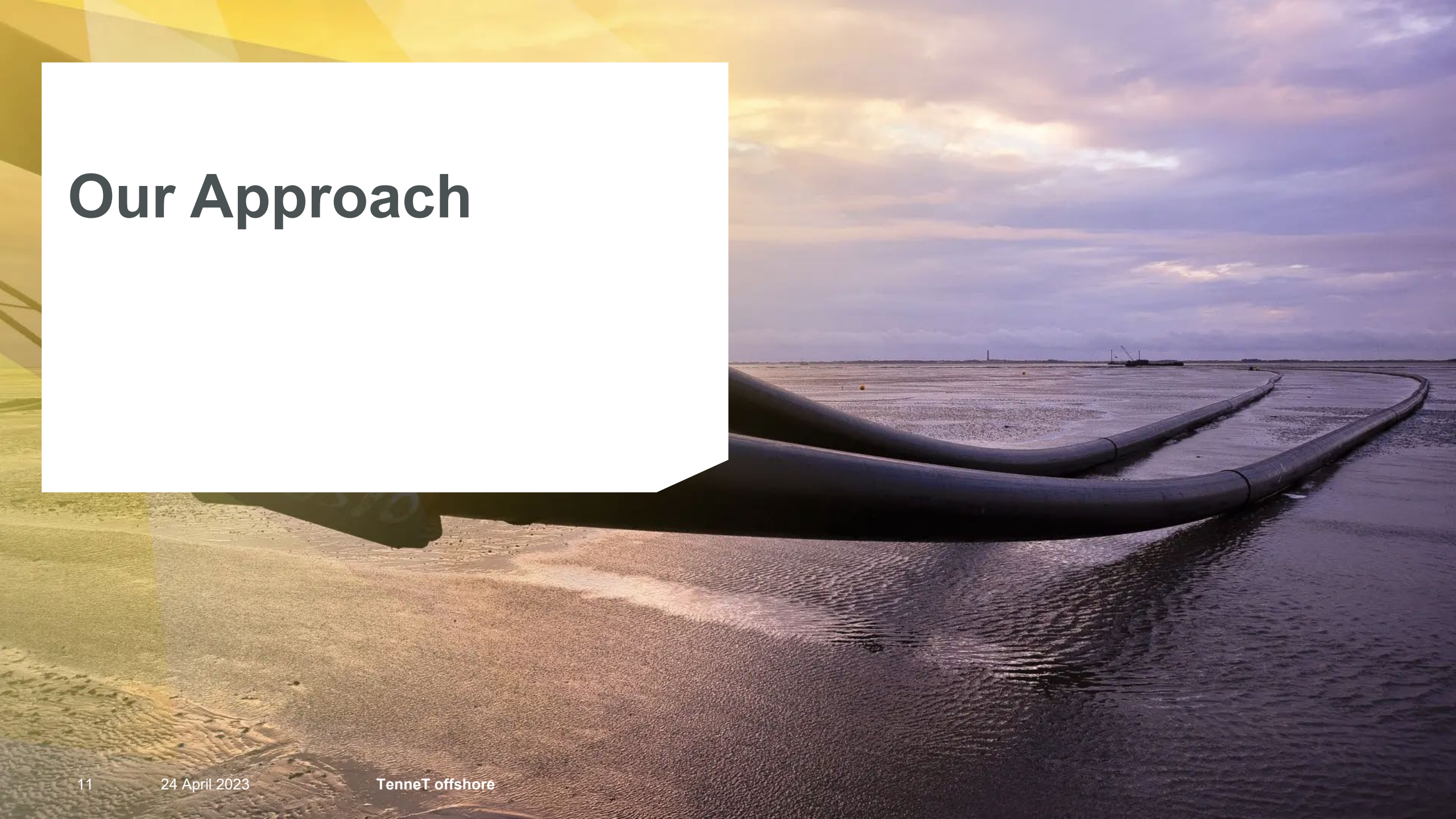
Our offshore projects until 2031
Offshore grid connections

We already operate **17 offshore grid connections** in the Netherlands and Germany and four interconnectors across European borders. **With 22 new connections to come until 2031.**

Currently supplying **more than 16 million European households.**



Our Approach



A collaborative approach
Facilitating offshore grid expansion together

The challenge of European energy transition cannot be achieved alone.

As a transnational company operating both in the Netherlands and Germany, we know that close **collaboration is essential for delivering clean energy to Europe.**

Thinking ahead through partnership

Across all levels

Market

Forming close partnership agreements together with the market to stimulate growth and secure crucial links of the supply chain.

Thinking ahead through partnership
Across all levels

Other TSOs

Teaming up and closely cooperating with other TSOs, also cross-border in order to bring beacon projects for Europe's energy system of the future to life.

Thinking ahead through partnership

Across all levels

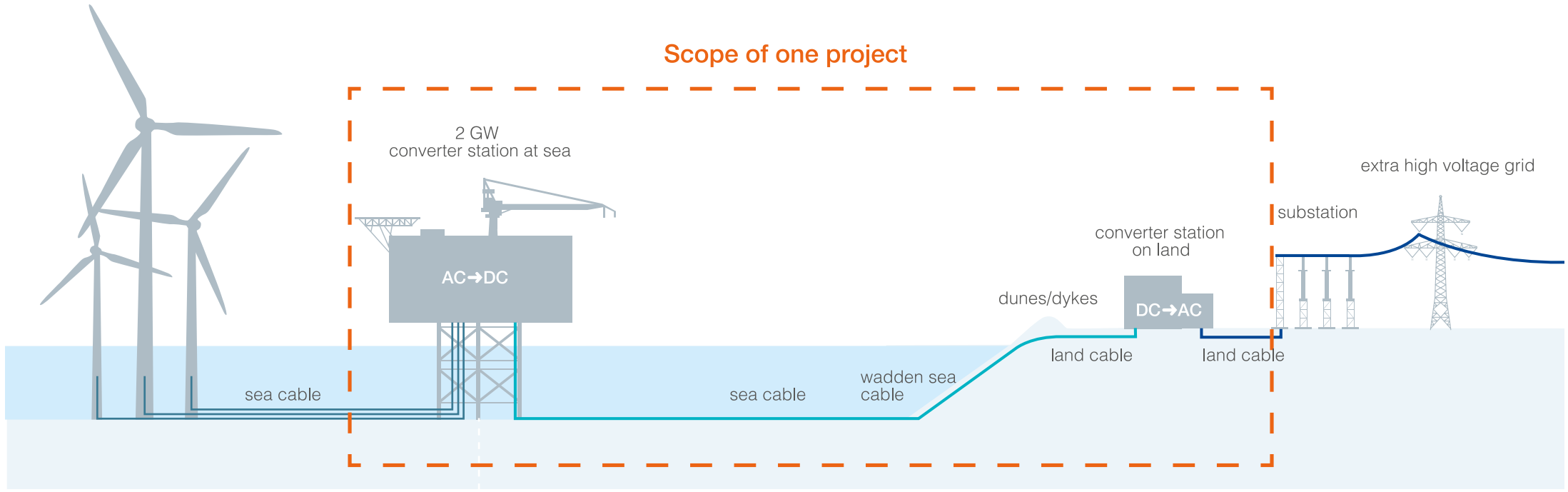
Research programmes

Participating in **numerous European research programmes** to facilitate cross-border connectivity. Such as **our engagement in InterOPERA** – a cooperation of more than 20 partners heading towards a meshed offshore grid.

Our expertise

Elements of an offshore grid connection system

Delivering green wind energy safely from sea to land



Example of a 2GW grid connection system

Offshore grid connection systems safely **transmit large amounts of green electricity** generated at wind farms in the North Sea **to land and feed them into the onshore power grid.**

Acting responsibly every step along the way
From building, transportation & installation to operation

HVDC stations
(offshore and onshore)

Subsea cables

Land cables

Horizontal
directional drilling
(HDD) method

ALL WITH AND THANKS TO OUR STRONG PARTNERS.

Onshore converter station
Our expertise

At our onshore stations, the electricity is **converted from DC to AC**. Then brought to the voltage level of the onshore grid.

This way, the renewable energy from sea can be fed into the national high-voltage electricity grid.

Providing the industry and millions of households with green energy.

Public participation
Engaging in dialogue

Much-needed and extensive grid expansion requires **societal acceptance.**

Therefore, it is crucial that **we engage with people right from the beginning**.

We regularly organise stakeholder dialogues to actively **ask for and listen to the concerns of our local communities**.

DolWin6
One of a kind: 900 MW DC

The DolWin6 grid connection system and the corresponding DolWin kappa platform are **connected to Hilgenriedersiel via a cable that crosses the island of Norderney**.

DolWin6 is scheduled to be commissioned in 2023 and **will provide over 1 million households with renewable energy.**

Facts and figures
- 90-kilometre-long link using HVDC with a maximum transmission capacity of 900 MW
- 45-kilometre land cable, 45-kilometre subsea cable
- Grid connection point: Emden/Ost

Hollandse Kust (noord)
One of a kind: 700 MW DC

Hollandse Kust (noord) is the fifth and final 700 MW connection from our ‘Roadmap 2023’ agreement.

Hollandse Kust (noord) has been **commissioned in Spring 2023** and **will provide more than one million households** with renewable energy.

Facts and figures
- Connecting 69 wind turbines of operator CrossWind
- Roughly 20 kilometres off the coast of Egmond aan Zee
- Grid connection point: Wijk aan Zee

Our Responsibility

Corporate Social Responsibility
Protecting people, flora and fauna

When planning and implementing our grid connection systems in the sensitive at sea or on land, **safe operations and the protection of the environment are our top priorities**. We have translated our ambitious sustainability goals into overarching themes for how we conduct our business. **And we challenge our partners every day to follow us**.

Climate Impact

We require every contractor to demonstrably **reduce CO_2 emissions** when carrying out operations for us. We only **work in sensitive habitats, when regulations and time allows, so flora and fauna can regenerate.** And we use modern low-impact technologies like the horizontal directional drilling method.

Corporate Social Responsibility
Protecting people, flora and fauna

When planning and implementing our grid connection systems in the sensitive at sea or on land, **safe operations and the protection of the environment are our top priorities**. We have translated our ambitious sustainability goals into overarching themes for how we conduct our business. **And we challenge our partners every day to follow us**.

Circularity

We encourage all our partners to choose **materials** that can be **used longer**, **are environmentally friendly**, and can be **reused** after use. To this end, we ask contract partners to investigate **where materials come from** as well as how they are processed, transported and subsequently reused.

Corporate Social Responsibility
Protecting people, flora and fauna

When planning and implementing our grid connection systems in the sensitive at sea or on land, **safe operations and the protection of the environment are our top priorities**. We have translated our ambitious sustainability goals into overarching themes for how we conduct our business. **And we challenge our partners every day to follow us**.

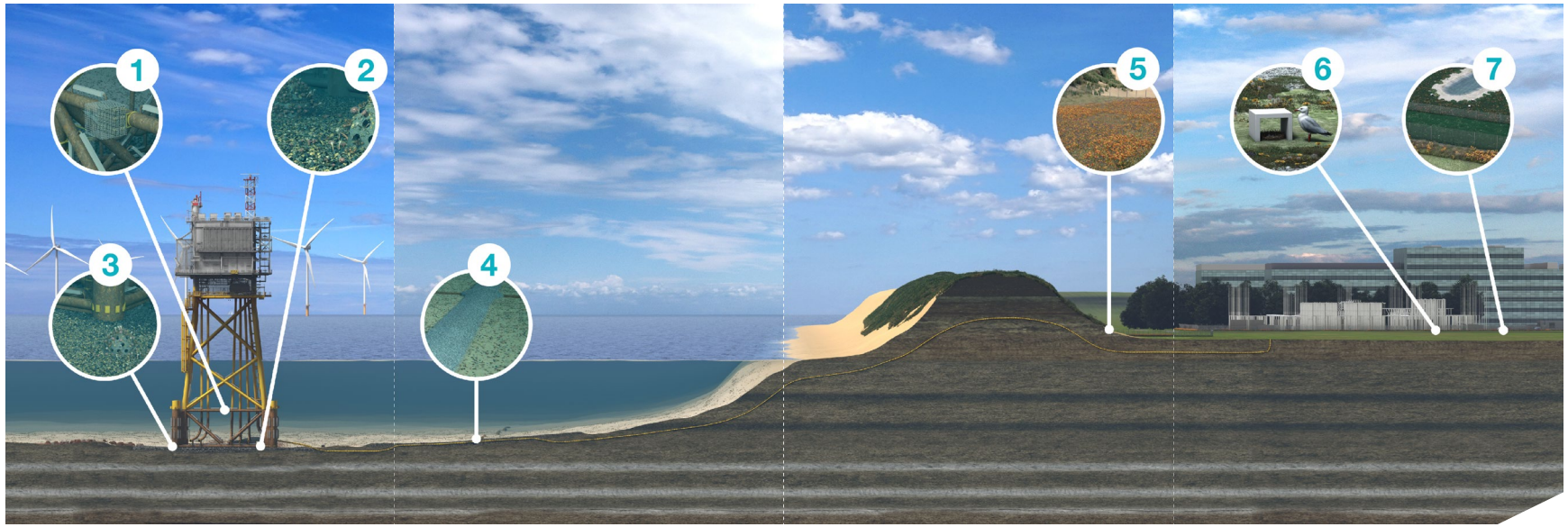
Nature-inclusive design

We are always looking for ways to increase biodiversity and the quality of life for animals and plants in the vicinity of our systems. And we expect our contractors to do the same. Hence, we ask to **critically look for opportunities to integrate nature into our technical designs**.

Compensation measures
Integrated technical ecological design

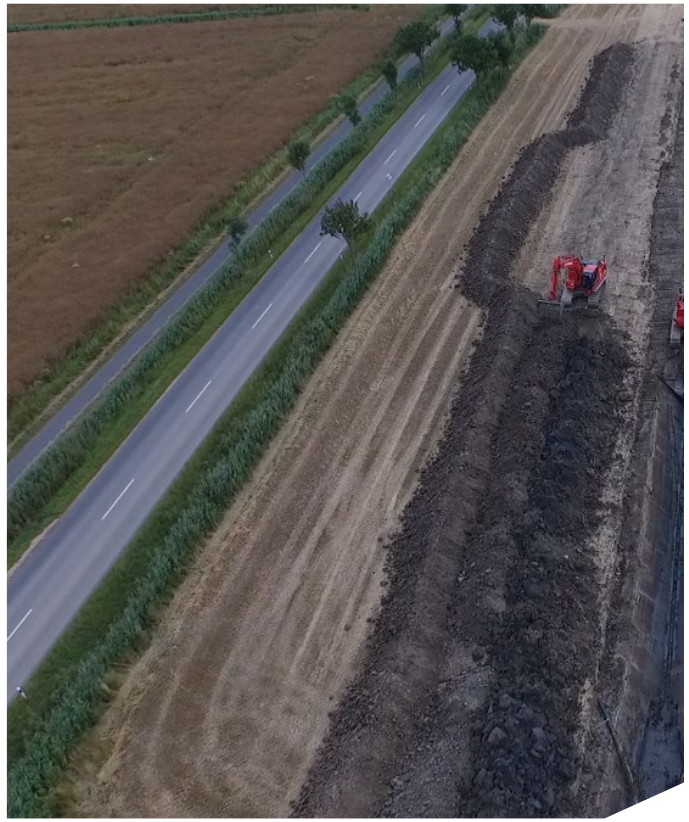
Our partners joined our approach to actively look for opportunities to integrate nature into our designs.
The results are impressive: together, we have developed measures that will now become new standards.

Grid expansion can only happen sustainably.
We acknowledge the **principle of co-use**. This way, we **protect flora and fauna**.



7 Ecological landscaping
6 Coastal bird breeding area
5 Ecological landscaping
4 Eco cable crossings
3 Eco-friendly stone deposit
2 Artifcial reefs
1 Fish hotels

Compensation measures
Renaturalised cable trench



2015: During construction phase

2016: Area in the following year

2017: Two years after completion

Local value creation
Attracting people and business

With our projects, **we often stimulate the local economy**. When possible, we work with local service providers. And during construction, our employees strengthen local the local hotel business and out-of-home market.

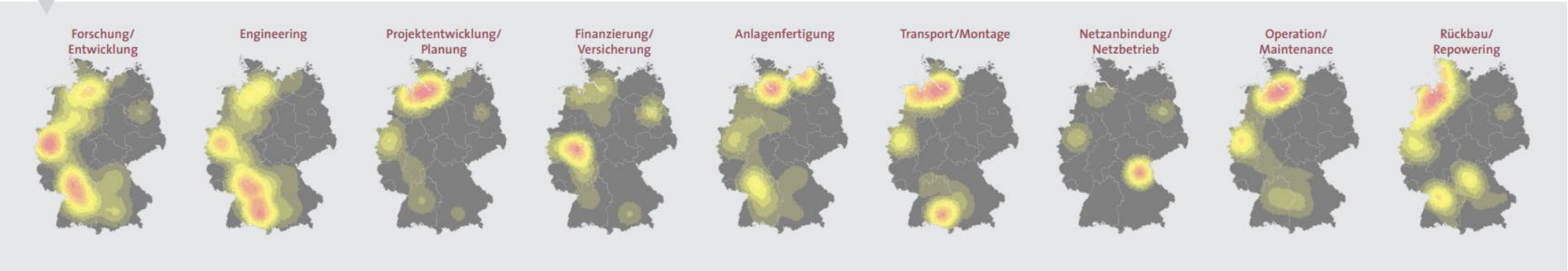
And there‘s more to it: with our infrastructure, we set **incentives for further investmens in the region** and for **creating and securing local jobs. As our systems transmit large volumes of green energy, they attract** future industries, such as green hydrogen production, to settle in the vicinity.

National value creation

Regional distribution by number of employees according to Value-added stages

The north of Germany is dominated by turbine and foundation production, project developers and planners for offshore wind energy, while in the south value is added increasingly by financing and engineering. In the west clusters of economically influential market players can be found.

wind:research 2022, Institut für Trend- und Marktforschung



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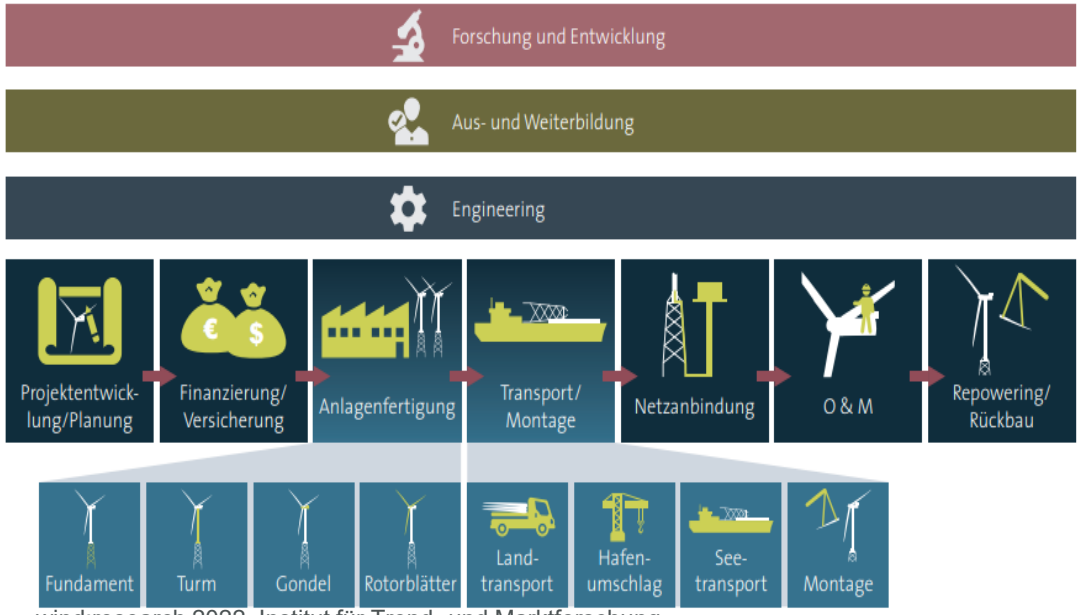
Value creation across various disciplines

Studies undertaken over last years showed that value creation in offshore wind energy can be gained from

- initial planning
- installation and operation
- dismantling

- research and development
  engineering



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Local value creation
Examples

Cuxhaven

Helgoland

Helgoland as a service point for the offshore wind farms has opened up new opportunities for the island."

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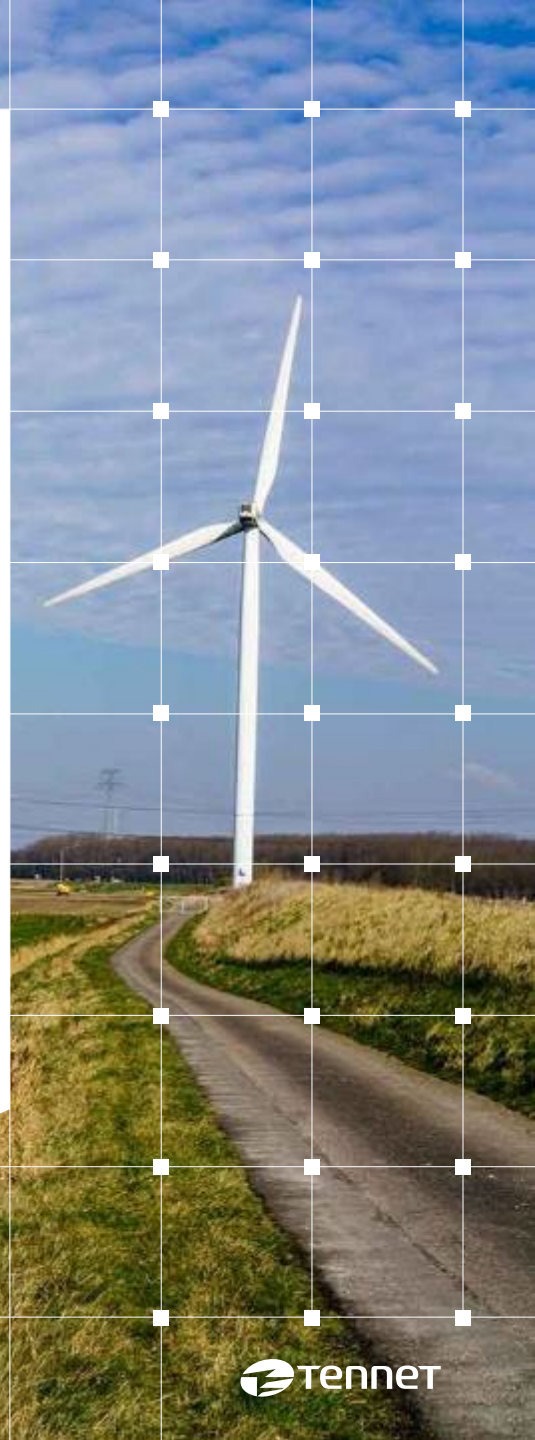
TenneT is a leading European grid operator. We are committed to providing a secure and reliable supply of electricity 24 hours a day, 365 days a year, while helping to drive the energy transition in our pursuit of a brighter energy future – more sustainable, reliable and affordable than ever before. In our role as the first cross-border Transmission System Operator (TSO) we design, build, maintain and operate 25,000 kilometres of high-voltage electricity grid in the Netherlands and large parts of Germany, and facilitate the European energy market through our 17 interconnectors to neighbouring countries. We are one of the largest investors in national and international onshore and offshore electricity grids, with a turnover of EUR 9.8 billion and a total asset value of EUR 41 billion. Every day our 7,400 employees take ownership, show courage and make and maintain connections to ensure that the supply and demand of electricity is balanced for over 43 million people.
Lighting the way ahead together



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