

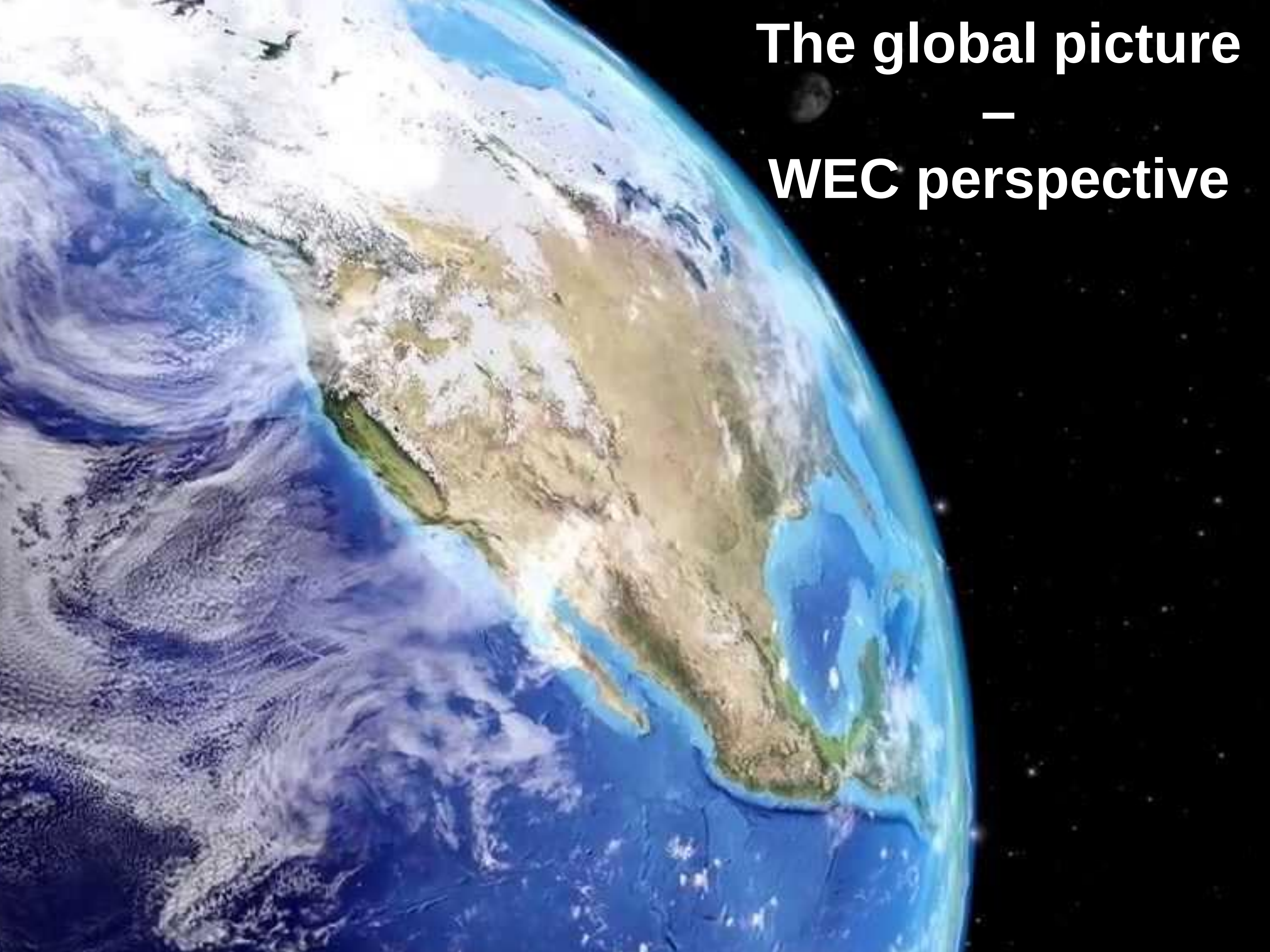




WEC 2017 North Sea Conference

Den Haag – Zuiderstrandtheater, 24th January 2017
Dr. Leonhard Birnbaum, Member of the Board E.ON SE
World Energy Council Vice-Chair Europe

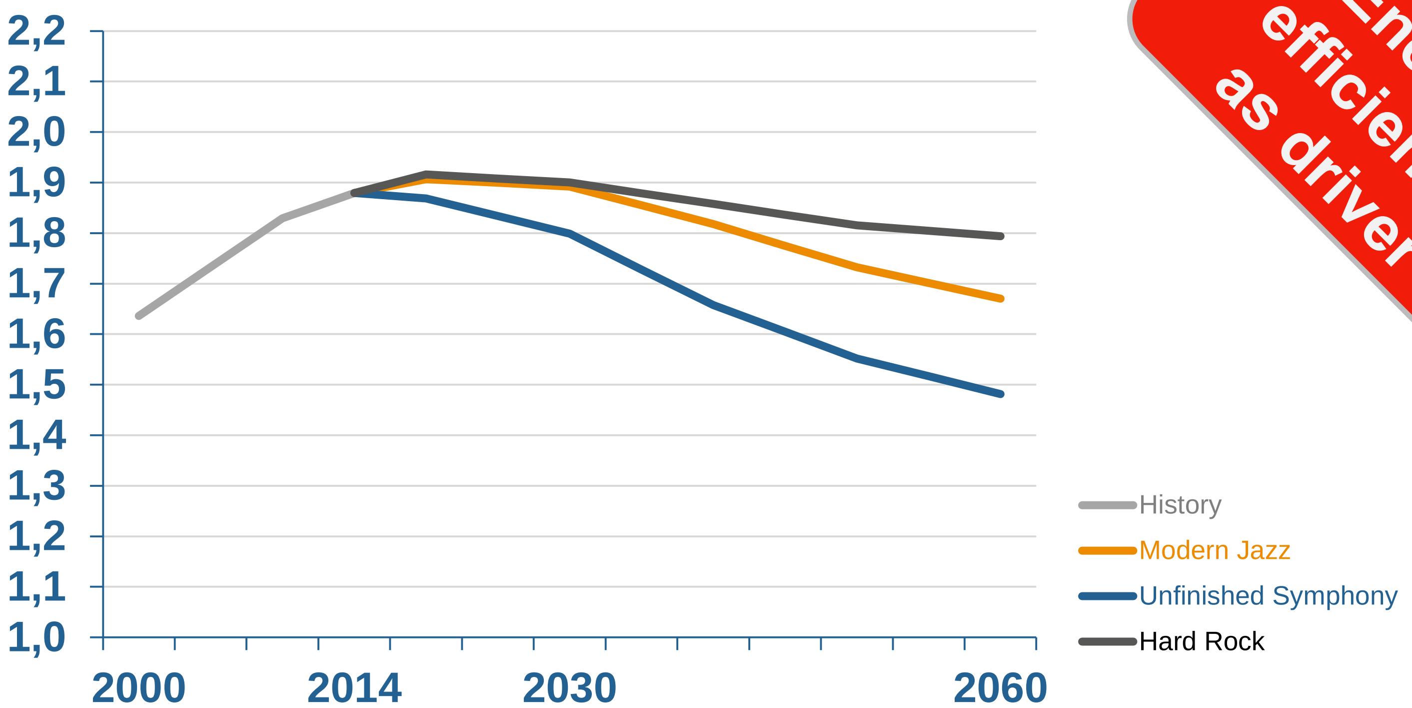
The global picture
–
WEC perspective



The World's primary energy demand growth …

…will slow and per capita energy demand will peak before 2030 due to unprecedented efficiencies created by new technologies and more stringent energy policies.

Final Energy Growth Rate (p.a.)



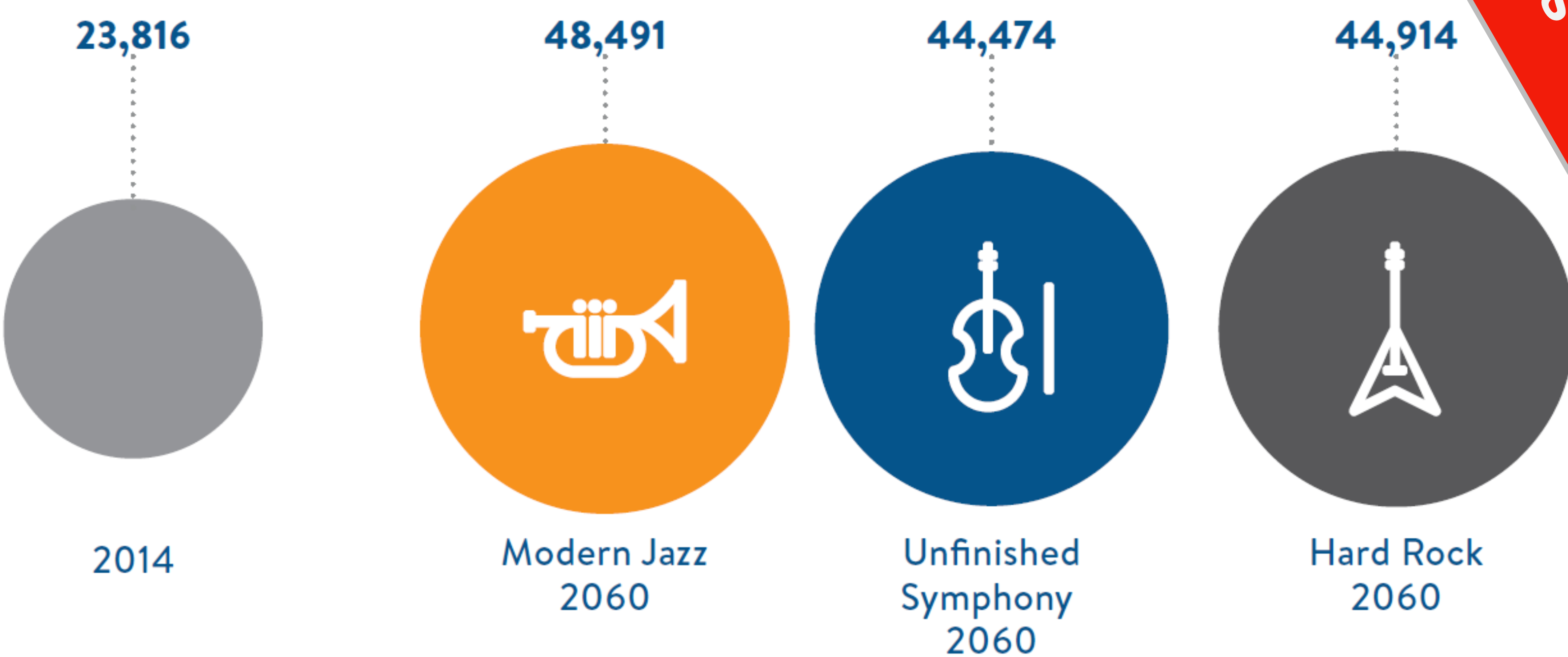
Source: World Energy Council, Paul Scherrer Institute, Accenture Strategy

Worldwide demand for electricity will double by 2060

Meeting this demand with cleaner energy sources will require substantial infrastructure investments and systems integration
to deliver benefits to all consumers.

Electrification goes on ...

Electricity Generation (TWh)



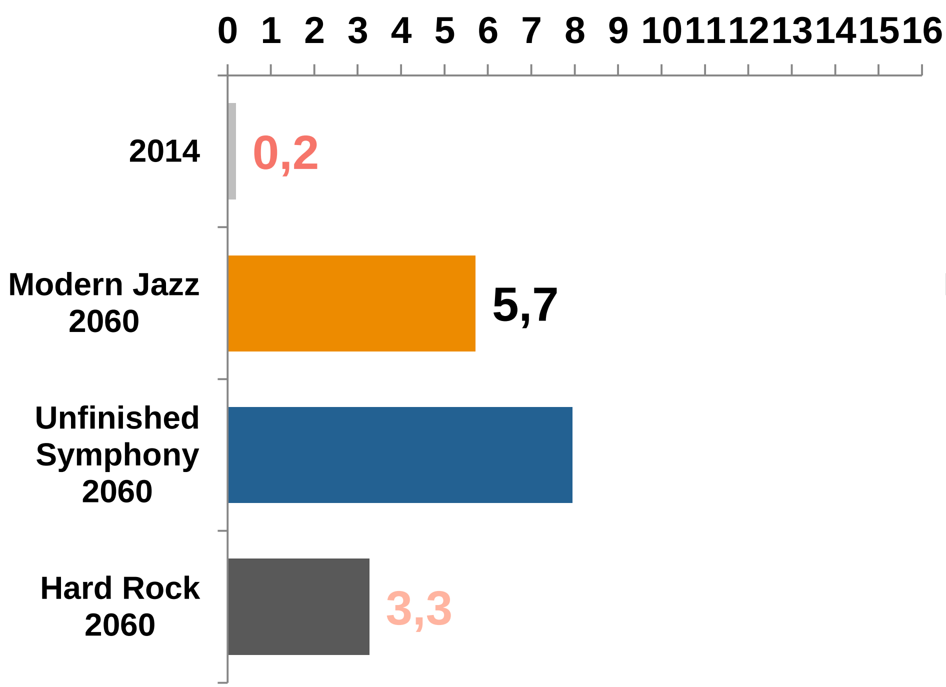
Source: World Energy Council, Paul Scherrer Institute, Accenture Strategy

The phenomenal rise of solar and wind energy will continue at an unprecedented rate

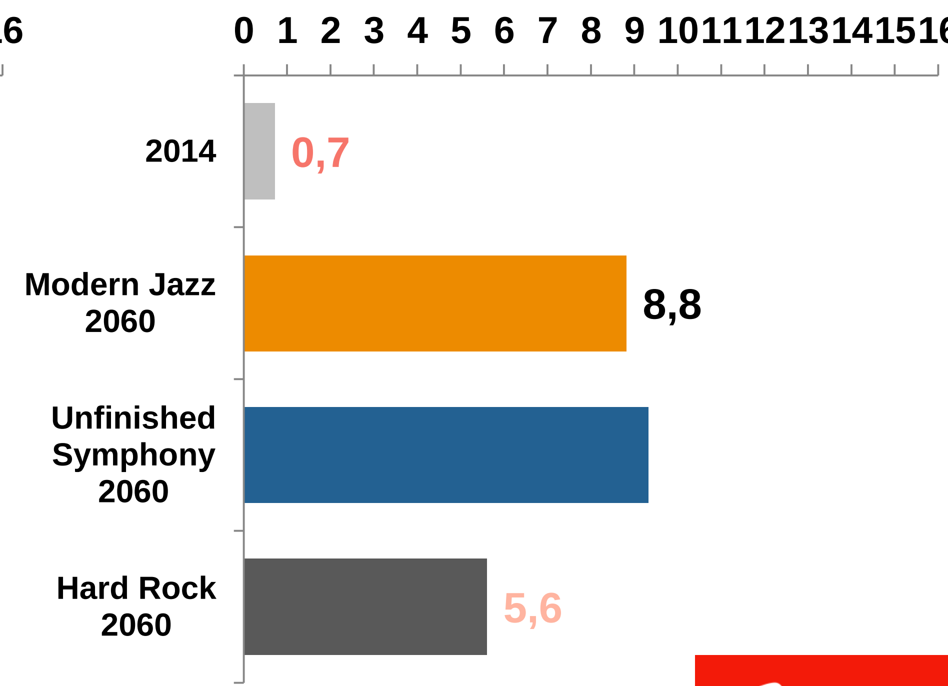
…mainly with renewables.

Electricity Generation by Source ('000 TWh)

PV



Wind



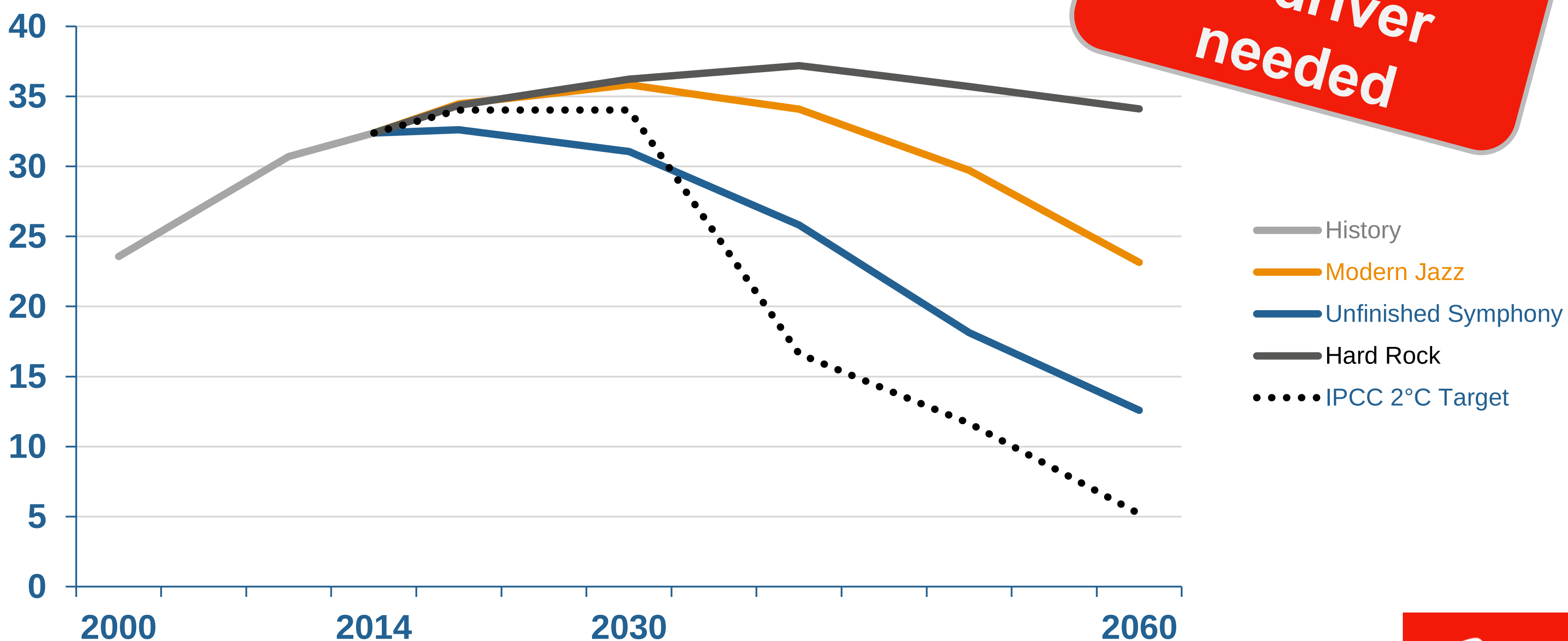
Source: World Energy Council, Paul Scherrer Institute, Accenture Strategy

Limiting global warming …

…to no more than a 2°C increase will require an exceptional and enduring effort, far beyond already pledged commitments, and with very high carbon prices.

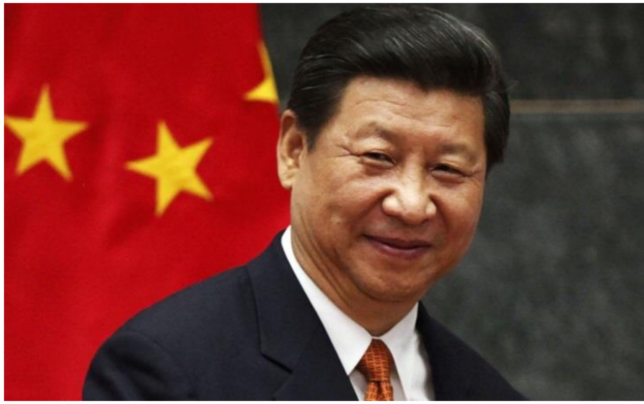
Cooperation as driver needed

Annual Carbon Emissions (GtCO2)



Source: World Energy Council, Paul Scherrer Institute, Accenture Strategy

Cooperation?



The company picture – E.ON perspective









Customers in the focus of our activities


Barbara


Frank

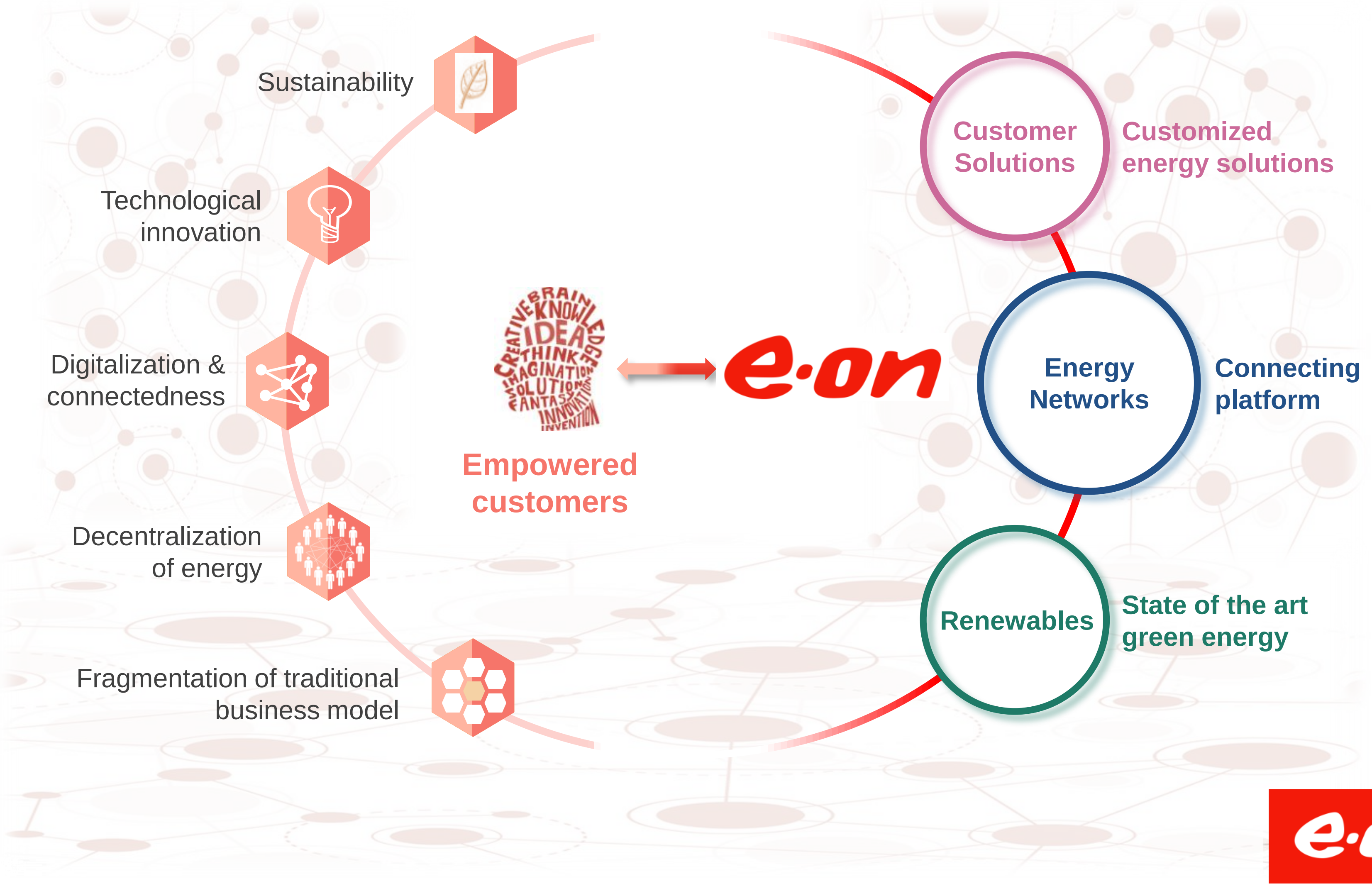

Helga


Manfred


Nadine

And all customers have their own needs

As a consequence E.ON has split in two companies



The necessities of our customers ….
… are the new challenges for us

Key trends in the energy sector …

Decarbonisation, Renewables

Decentralisation & individualisation

Digitalisation of the energy sector

Challenge #1:
building smarter energy systems

Challenge #2:
building smarter energy partnerships

Challenge #1: building smarter energy systems

Smarter Renewables

Smart coupling: Integration of transport (power & gas)

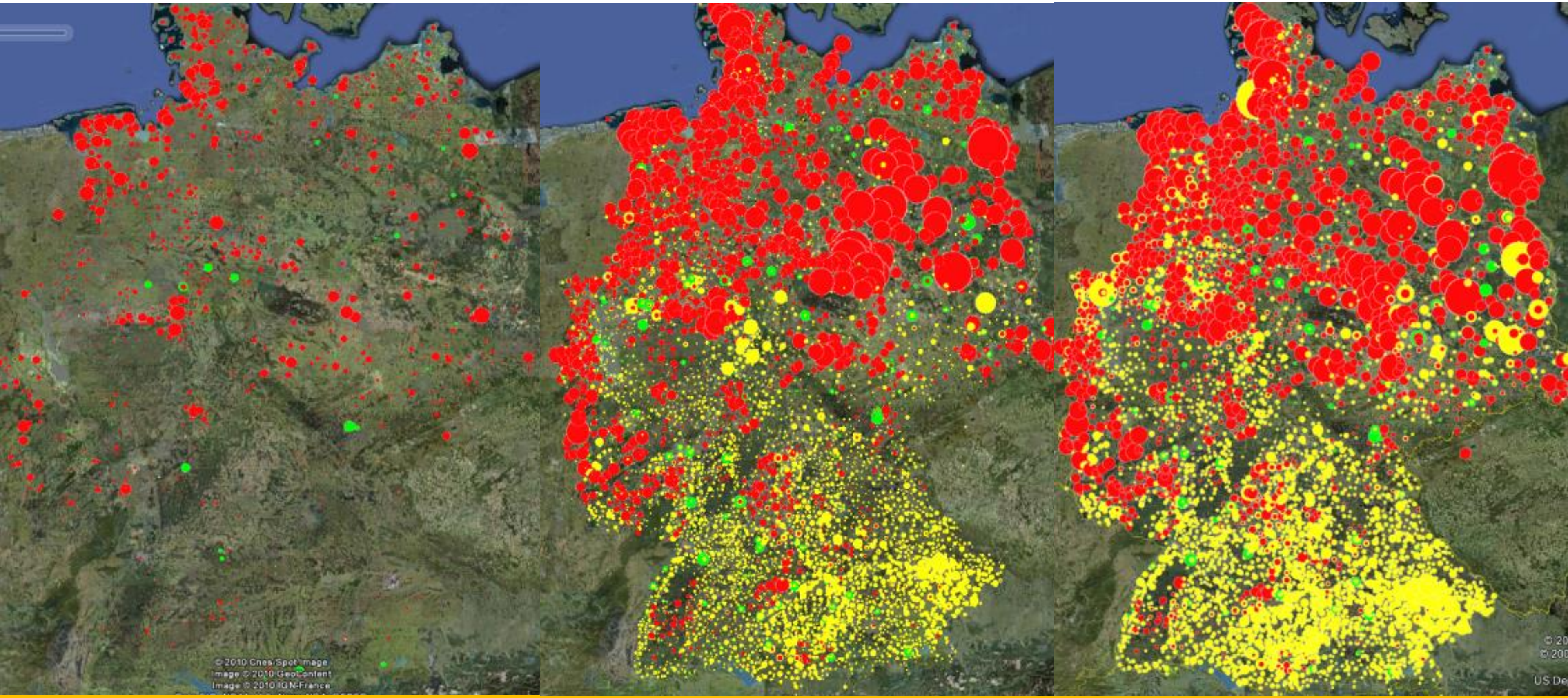
Cleaner & better conventionals

Smart grids / micro-grids

Smart copuling: Integration of heat

Renewables State of the art green energy

Smarter Renewables: Well integrated as mainstream solution



End **2000**	End **2010**	End **2015**
~ **30,000** installations*	~ **750,000** installations	~ **1.500.000** installations

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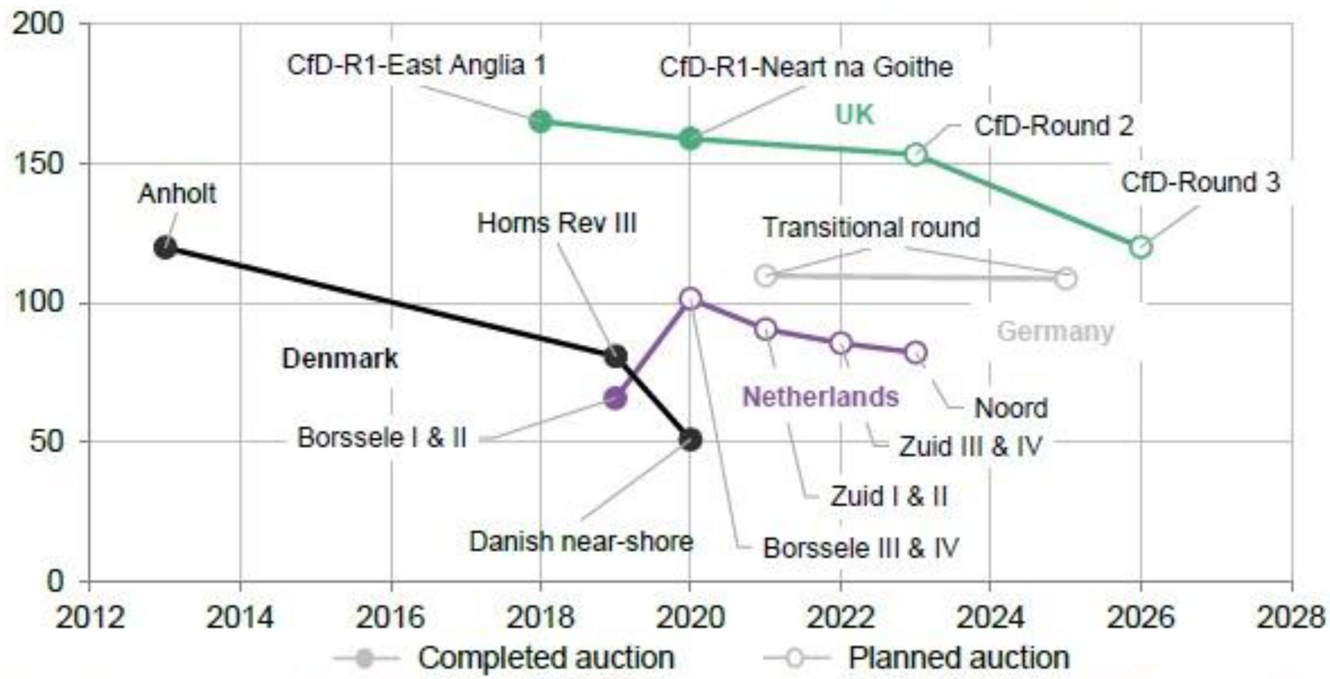
Renewables State of the art green energy

Smarter Renewables: More cost competitive

Wind offshore: Estimated project LCOEs by commissioning year, 2010-26 (2016 $/MWh)



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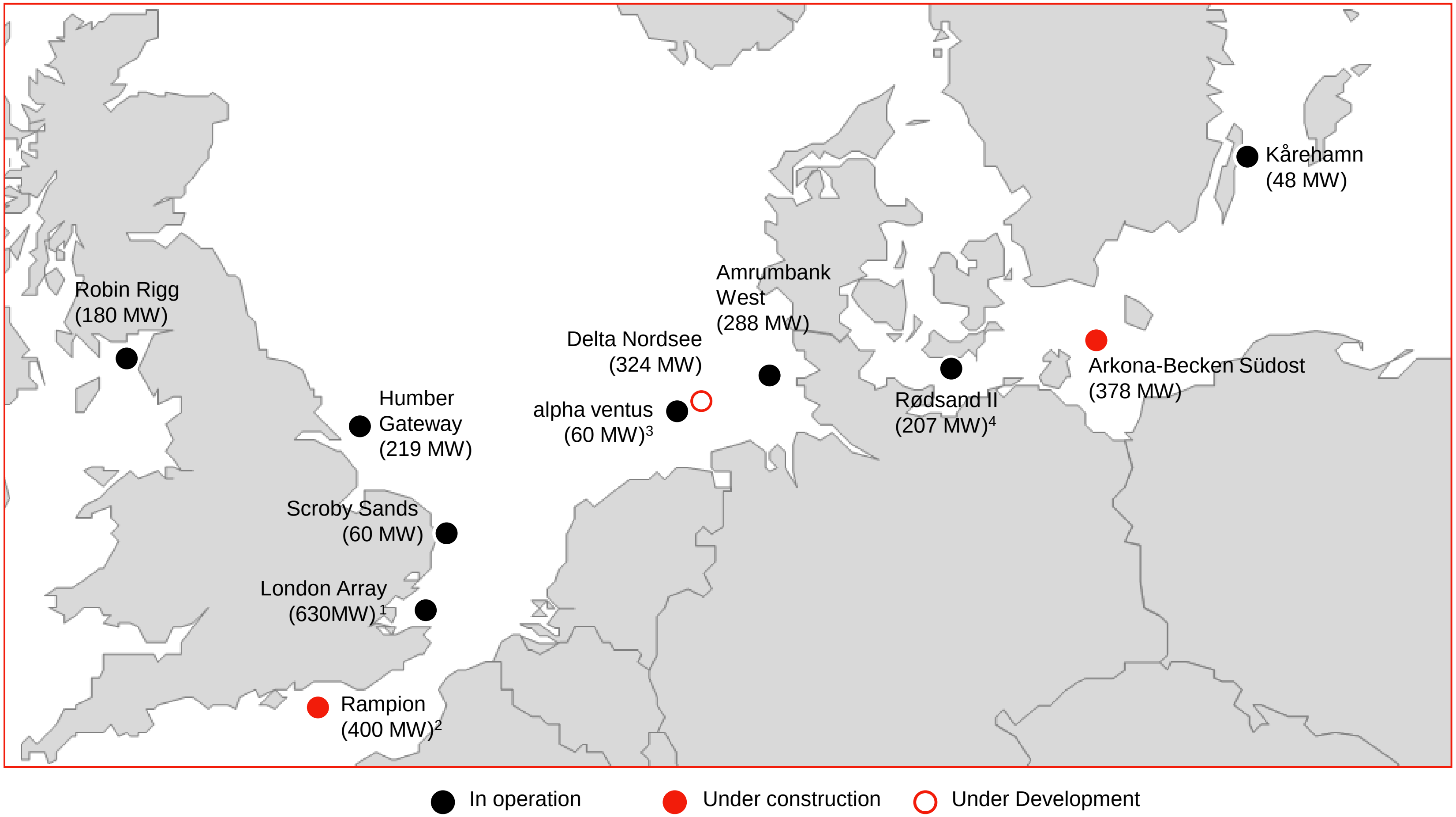
 Source: Bloomberg New Energy Finance

Renewables State of the art green energy

E.ON is the second-largest operator of offshore wind farms in the world



1. E.ON-share 30% (189 MW)
2. E.ON-share 50% (200 MW)
3. E.ON-share 26% (16 MW)
4. E.ON-share 20% (41 MW)

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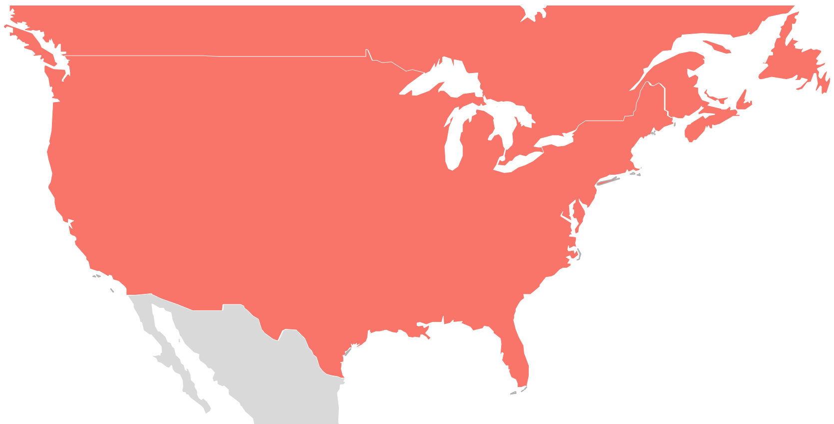
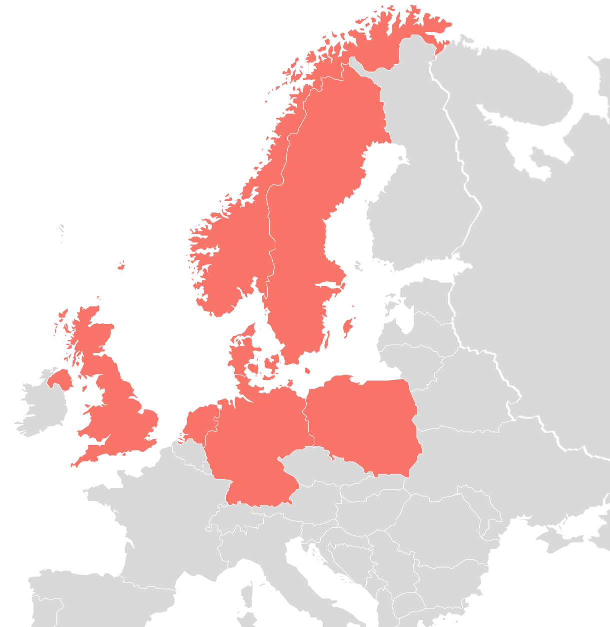
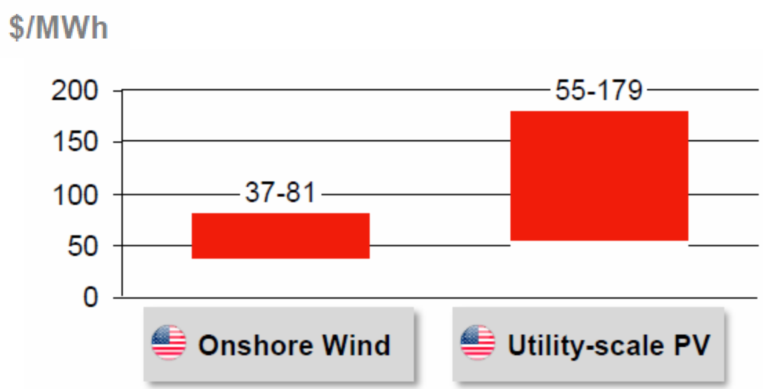
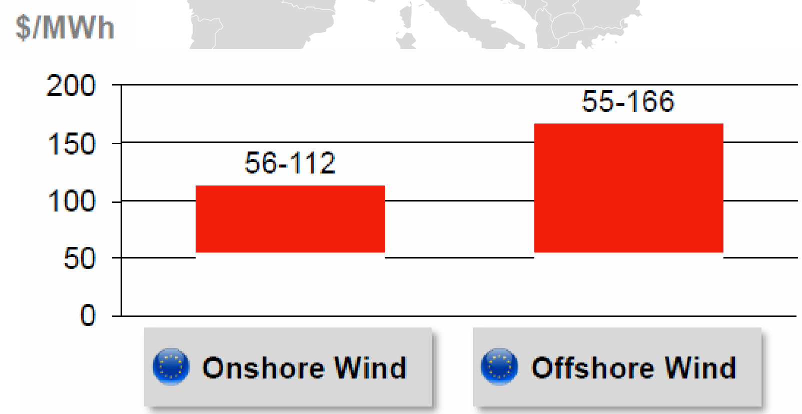
Renewables State of the art green energy

Smarter Renewables: Recent renewable projects





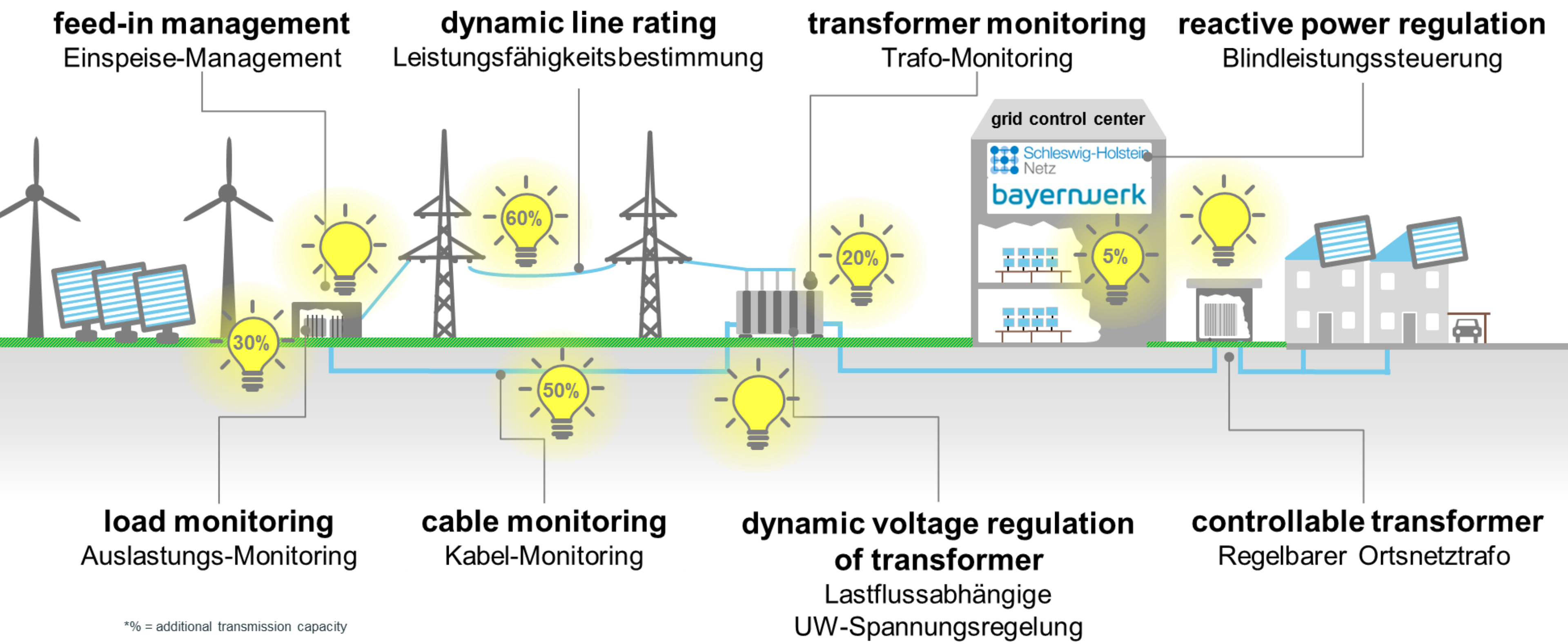




Source: Bloomberg New Energy Finance

Energy Networks Connecting platform

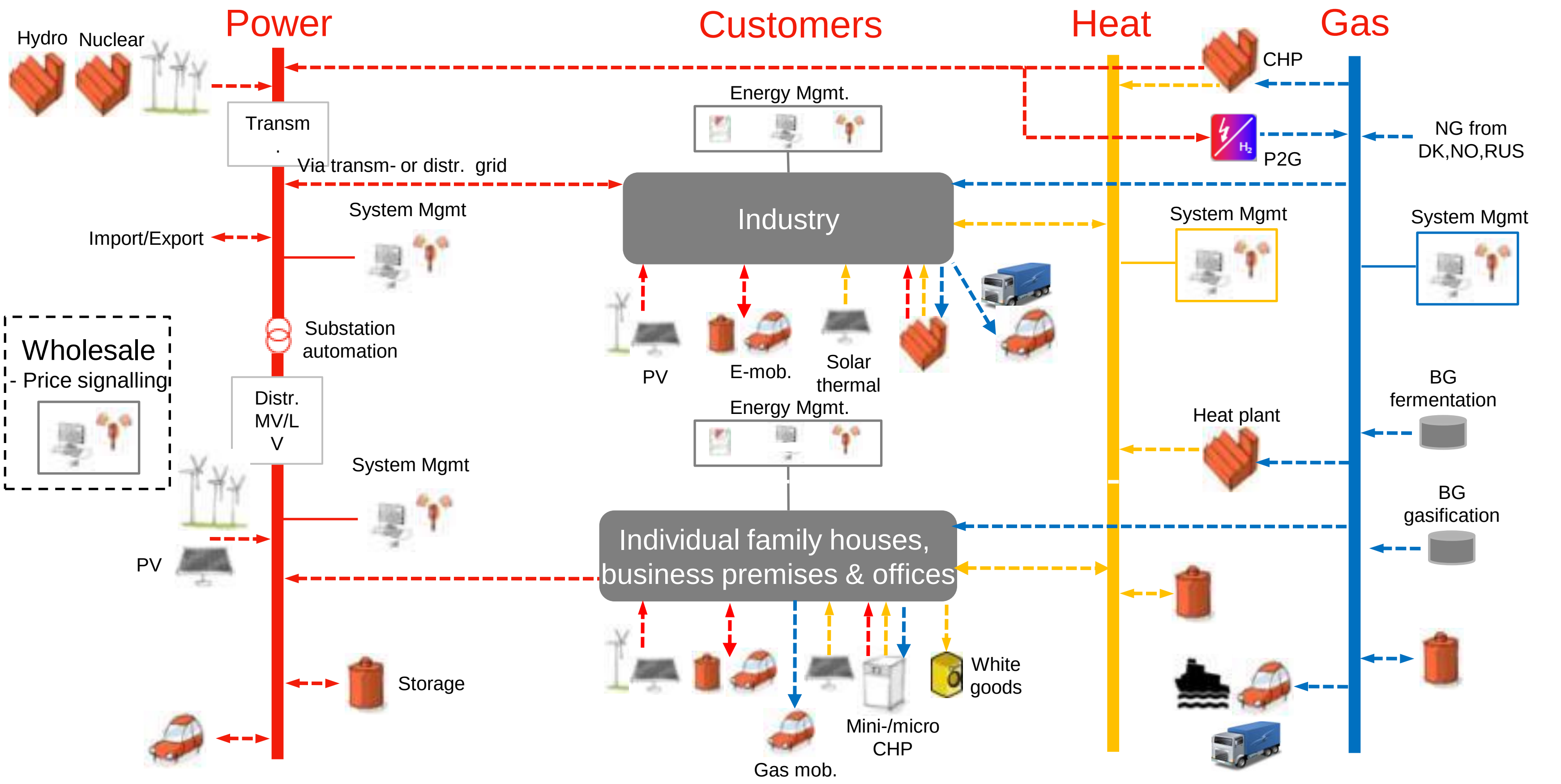
Smart Grids: Innovative Grid Technologies need to enable the integration of Renewables



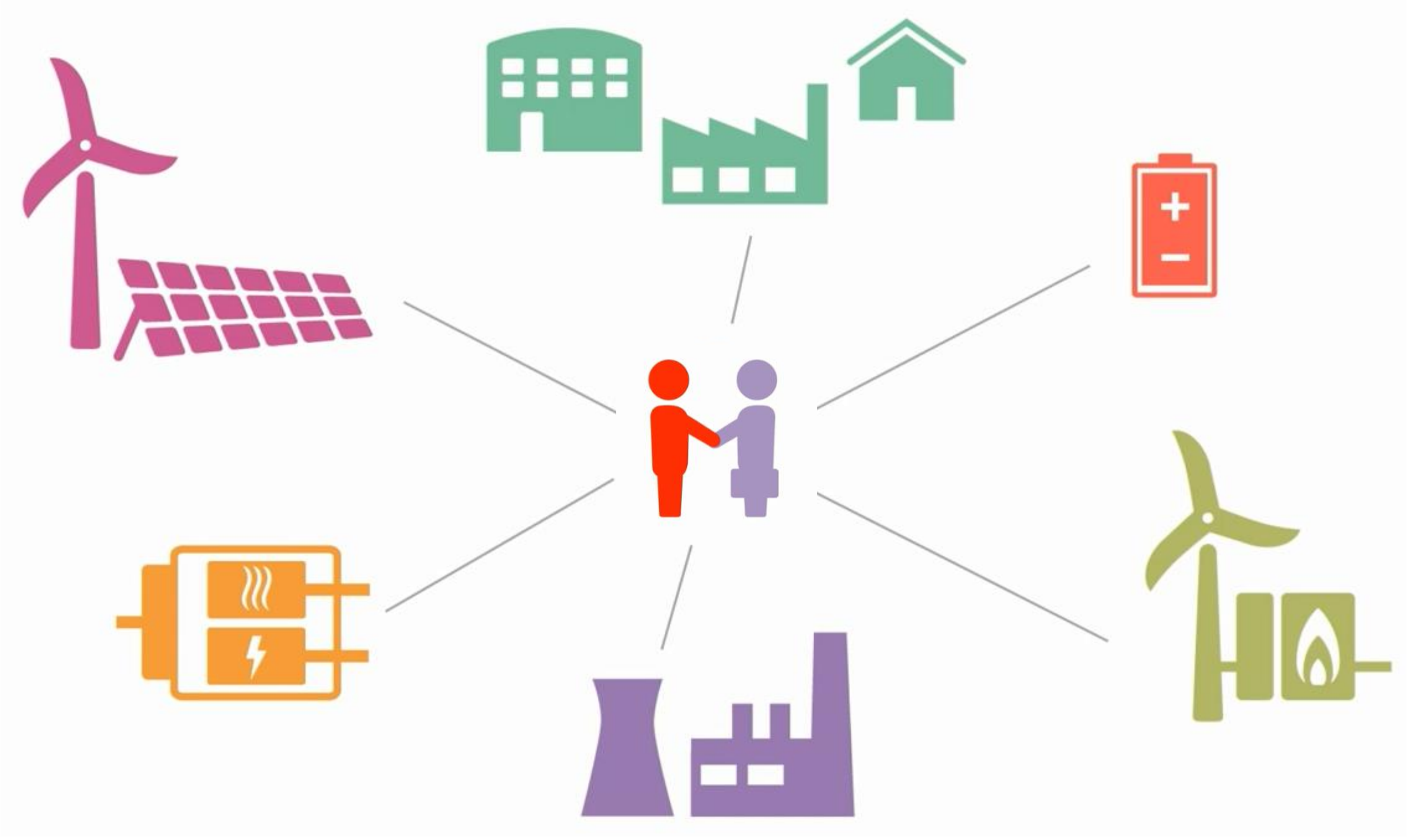
*% = additional transmission capacity

Smart coupling

Energy Networks
Connecting platform



Challenge #2: building smarter energy partnerships



B2C Solutions – Selected examples

PV/ battery



- **PV B2C** ~3,500 PV contracts signed
- **PV & battery** launched in April 2016 for B2C customers
- **„Solarprofis“:** 170 O&M contracts signed in first 7 weeks

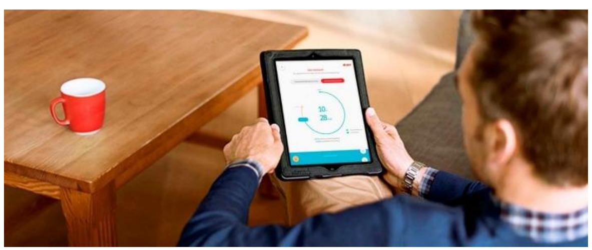
Customer engagement

Smart check

Saving energy toolkit (SET)

- **Smart Check** with ~35,000 customers in Germany, growing by ~10.000 registered users a month
- **SET** in the UK (~1 m SaaS[1], 0.8 m active)

Connected home



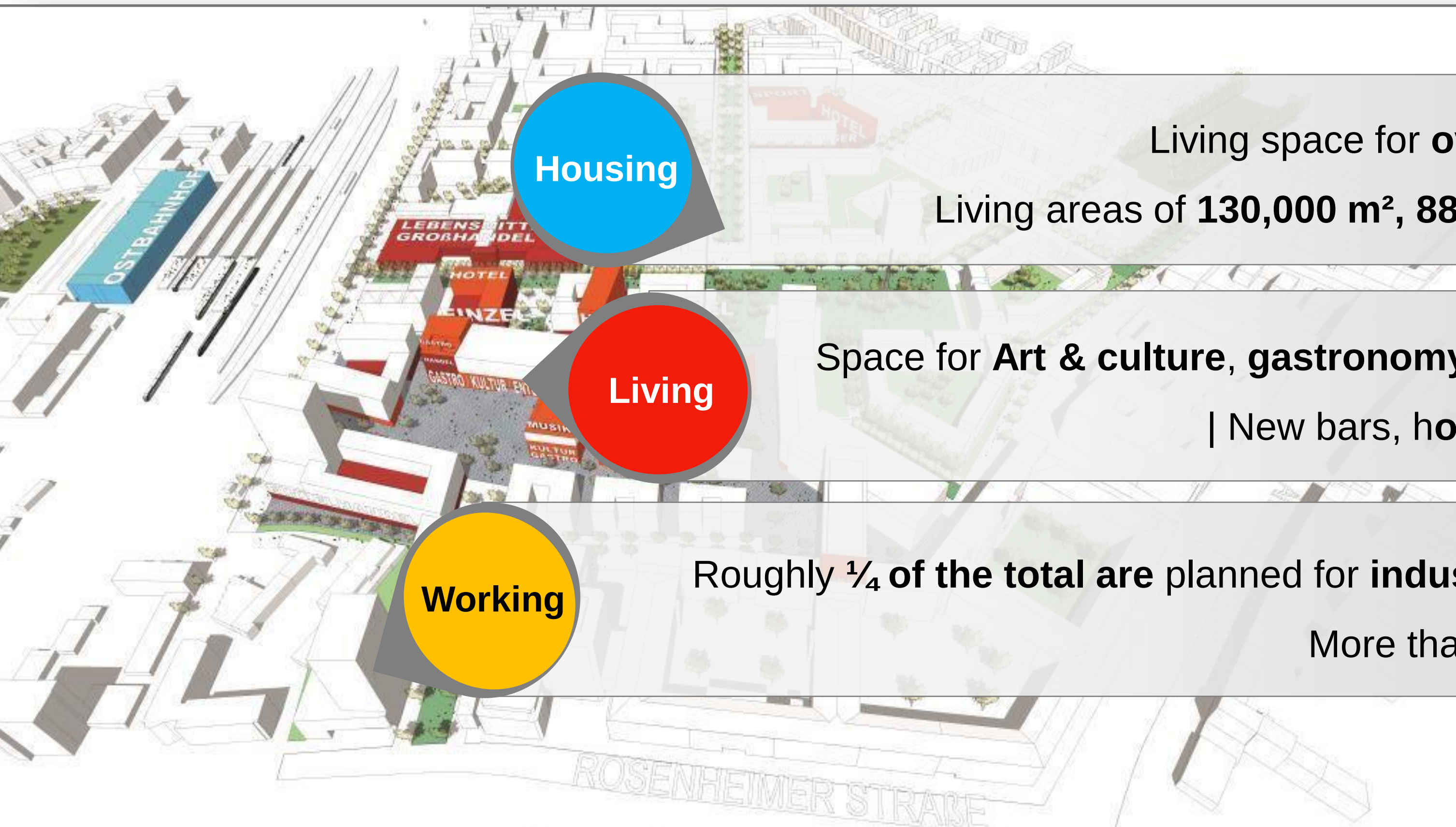
- Over 65,000 connected home devices deployed in large scale pilot projects

Value added services

- C. 400,000 customers make use of value added services, such as energy-related insurance services

1. Software as a Service provider: Opower

B2M: In the heart of Munich Bayernwerk Natur creates a new climate--friendly quarter



Housing

Living space for **over 3,000 people**|

Living areas of **130,000 m², 88.000 m²** land area

Living

Space for **Art & culture**, **gastronomy**, sport and shops

| New bars, h**otels** & restaurants

Working

Roughly **¼ of the total are** planned for **industrial real estate** |

More than **7,000 new jobs**

Bildquelle: Internetauftritt des Werksviertels München.

What does it all mean for offshore wind?

Changing perspectives for offshore wind

Times of offshore high margin projects are over

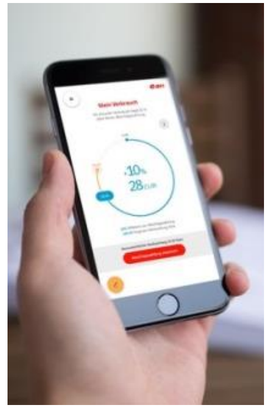
- Appropriate delivery models
- Excellence matters
- Scale matters
- Cooperation models matter

Times of low risk FIT are over

- See above
- Also for other RES

RES niche play is over

- RES need to take system responsibility
- System to be optimized cross-border for RES

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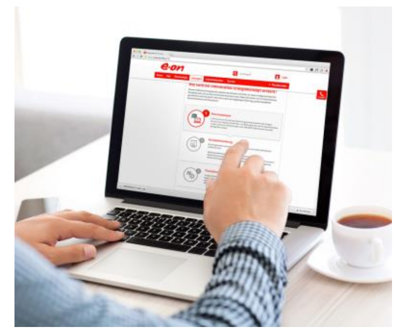


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