



Taking a broader view

DNV GL in Energy

Global reach – local competence



150+
years

100+
countries

100,000+
customers

12,500
employees

Internal use only

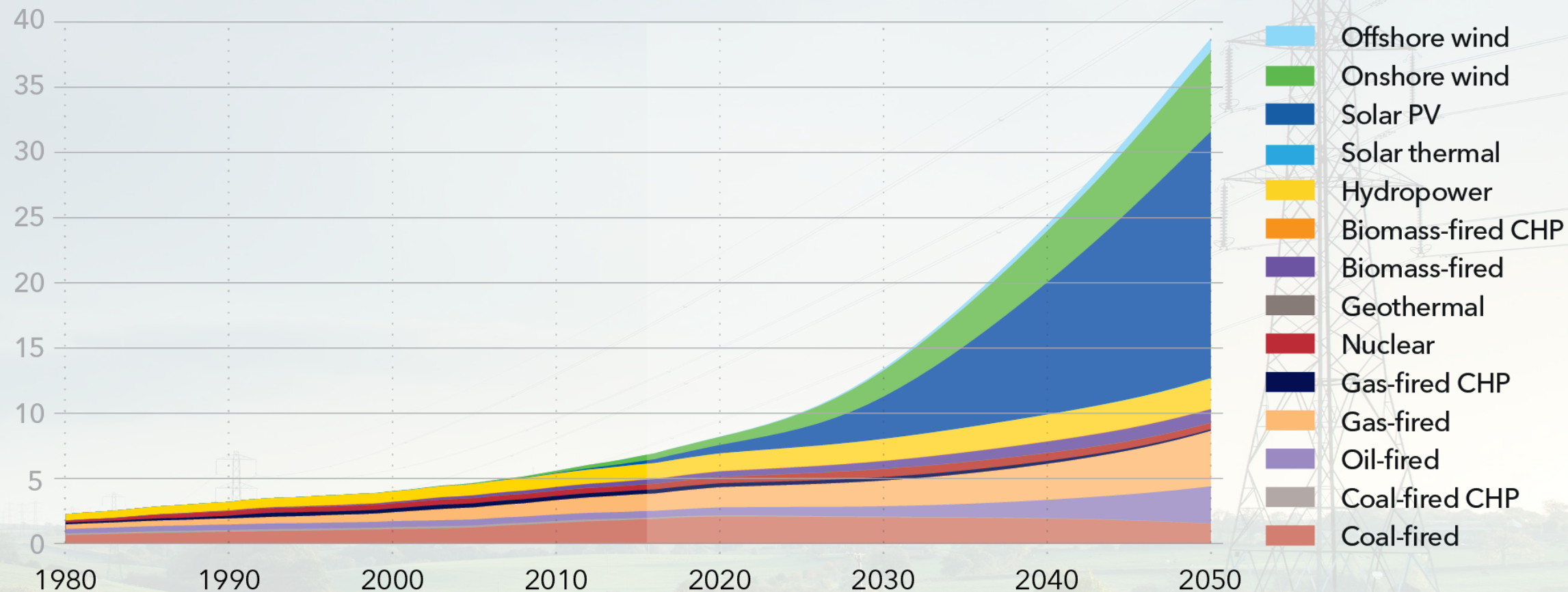


LET'S TALK **EXPERIENCE**

Internal use only

MORE THAN 5x NEW INSTALLED CAPACITY

Units: TW



Internal use only

FINANCE

400GW

We have carried out 400GW of wind Energy Production Assessments (EPA) globally up to 2017

200GW

We have conducted due diligence processes for approximately 200GW of wind energy globally

100GW

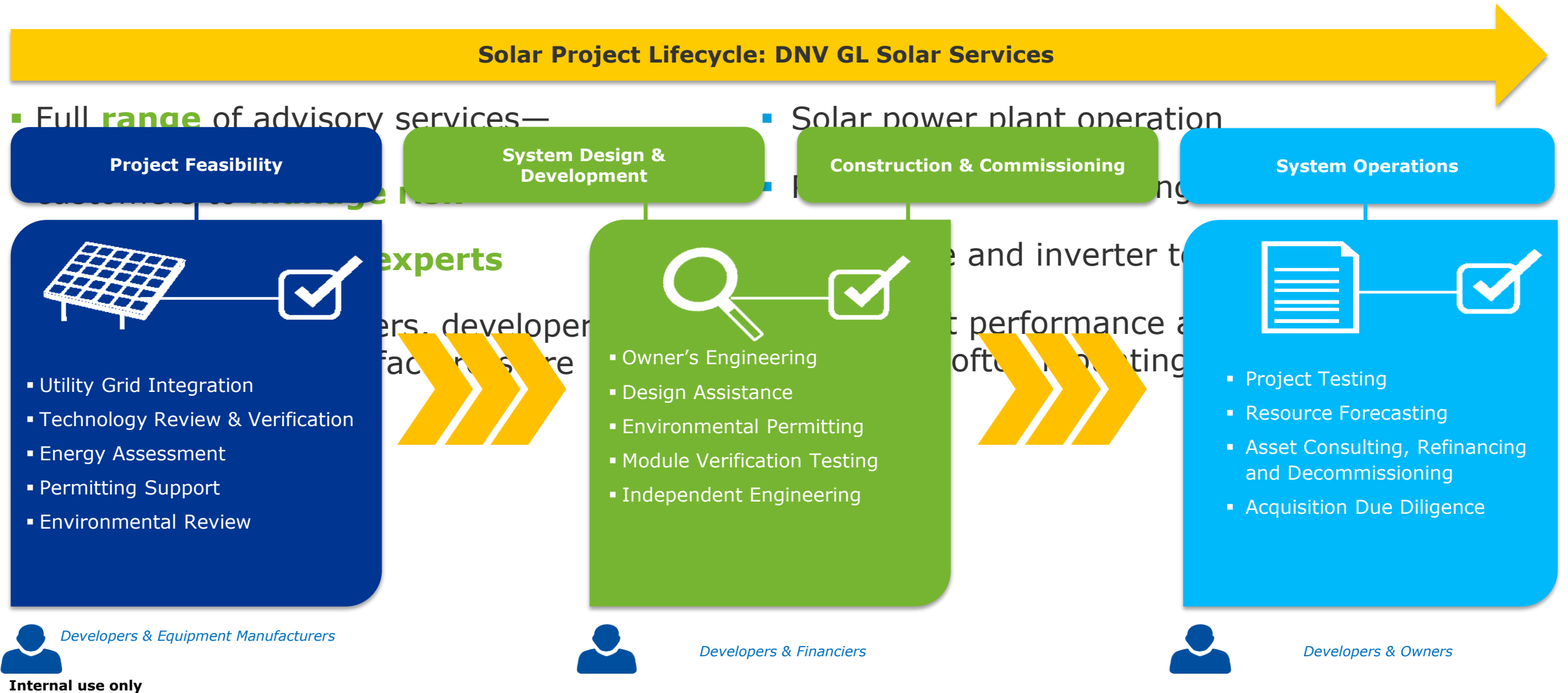
Our EPA data has been validated through evaluating 100GW of wind energy production data

5000

We have carried out energy assessments and technical due diligence for 5,000 solar projects

Internal use only

In a reduced margin environment, quality is a must



Key Equipment Risk - Floating Systems

High-density
Polyethylene



Galvanized steel



Solar tracking



Other early
concepts



There are many floating systems suppliers with various philosophies at different evolution stages

- Challenges to classify various floating PV suppliers
- Challenges to find specific standards for floating systems
- Concerns with long term quality, performance and reliability of the products and solutions from various floating PV suppliers

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Recommendation - floating systems

Manufacturing Quality Processes

- Quality control in manufacturing process
- Manufacturing documentation control
- Reuse of manufacturing waste %
- RMA process
- Compliance to QHSE standards
- Factory Acceptance test procedure

Health & Safety

- RoHS IEC 62321:2008
- Water Quality BS6920:2000

Environmental

- Freezing test: Tensile strength meets requirements after test [-20 °C, 120hr]
- Temperature test: Tensile strength meets requirements after test [-40 °C to 85 °C]

Process Documentation

- Design and installation manual
- Operations and installation manual
- Work method statements
- Installers training and qualification
- Testing and commissioning documentation
- Warranty documents T&C

Performance

- Water Tightness test
- Accelerated UV aging
- Material Thickness

Mechanical

- Dynamic load fatigue
- Concentrated load test
- Surface drop hammer test
- Wind tunnel test:
- Tensile strength test

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Thank you

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SAFER, SMARTER, GREENER

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