



A Sea of Opportunity in Europe

Focus on the Dutch North Sea

Eric van Ewijk, EBN



Introduction to Europe & the North Sea

*Dutch Offshore Gas
A Sea of Opportunity*

Setting the scene: Permian vs. North Sea basin

Location Permian & North Sea basins



Basin comparison

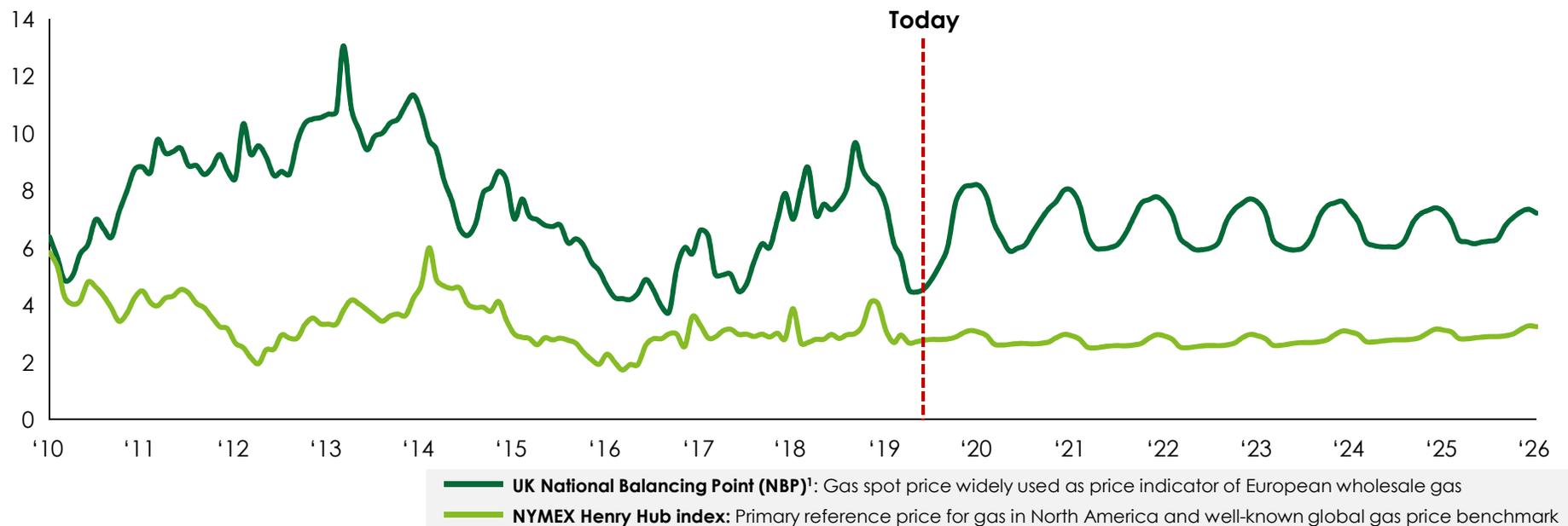
- The Permian Basin covers more than **86,000 sq. mi.** (220,000 km²), and extends across an area of approximately **250 miles** (400 km) wide and **300 miles** (480 km) long
- The North Sea covers an area of **290,000 sq. mi.** (950,000 km²), and extends across an area of over **600 miles** (970 km) wide and **360 miles** (580 km) long

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Gas price levels are significantly higher in Europe than in North America

Natural gas market prices (\$US/Mcf)



Note: 1. Projected NBP price levels based on future contract quotes
Source: EBN analysis

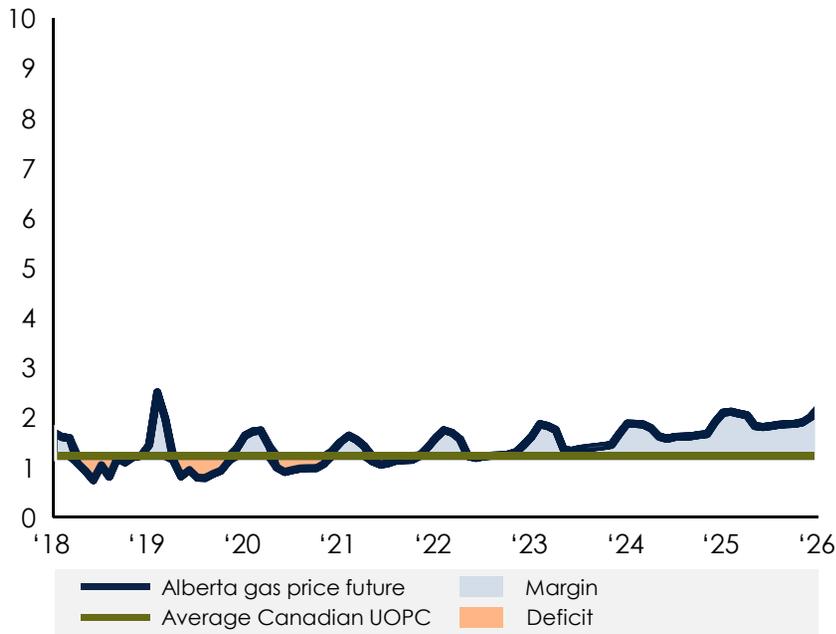
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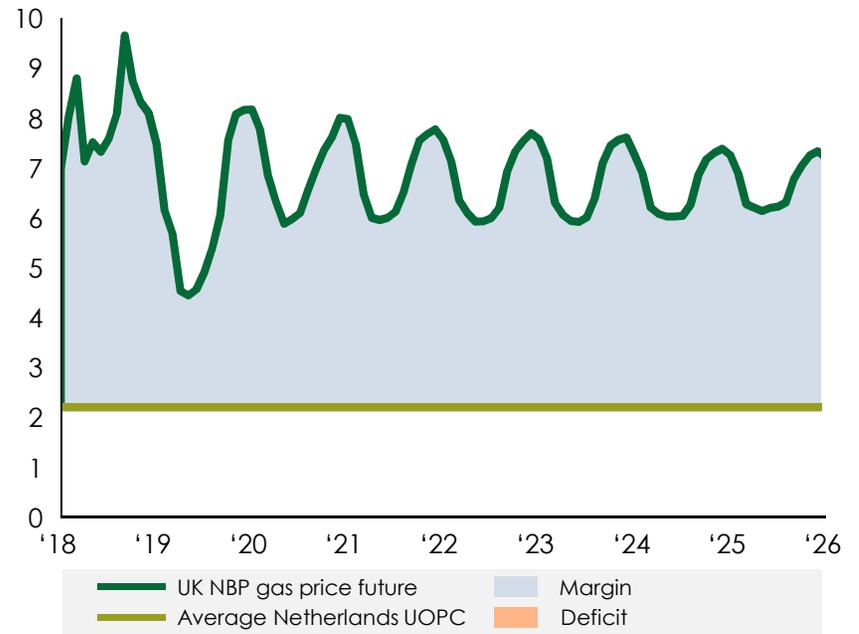
Introduction to Europe & the North Sea

This substantial price difference is not offset by a large divergence in production costs, as these are only slightly higher in the Netherlands than in North America

Alberta futures (\$US/Mcf) vs. (onshore) average Canadian Unit of Production Cost (\$US/Mcf)



NBP futures (\$US/Mcf) vs. offshore average Netherlands Unit of Production Cost (\$US/Mcf)

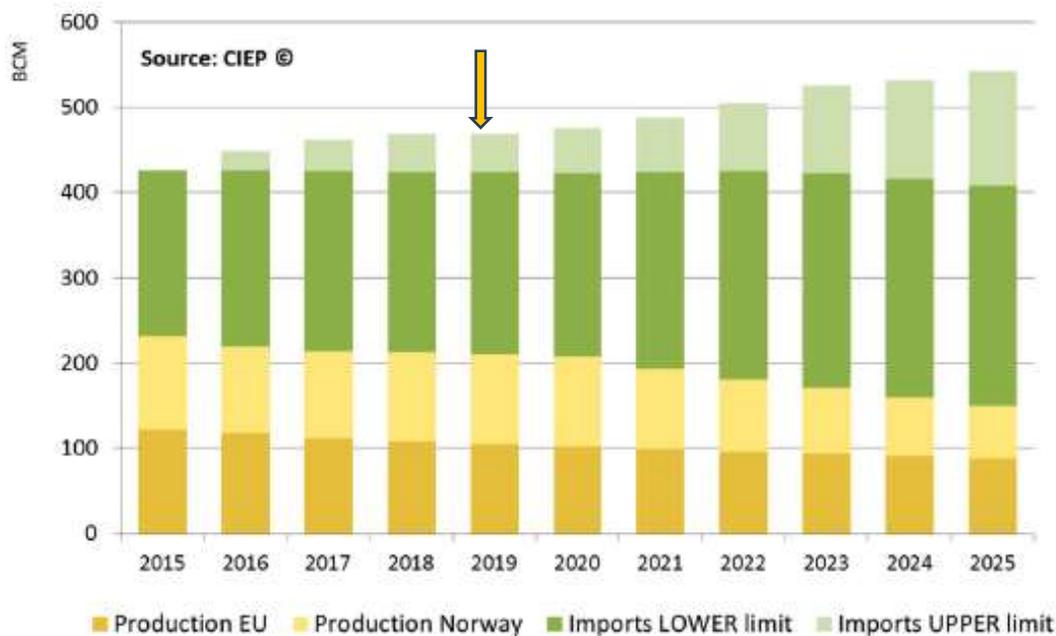


Source: EBN analysis

www.ebn.nl



European future production and imports



Source: Clingendael International Energy Programme

Total gas requirements in Europe climbs from 475 to 530 BCM (18.7 Tcf/j) in 2025
Production declines from 205 to 150 BCM (5.3 Tcf/j)
Current deficit of 270 BCM will increase to 380 BCM/j (13.4 Tcf/j)
This deficit in supply needs to be covered by new production and/or imports



Introduction to the Netherlands

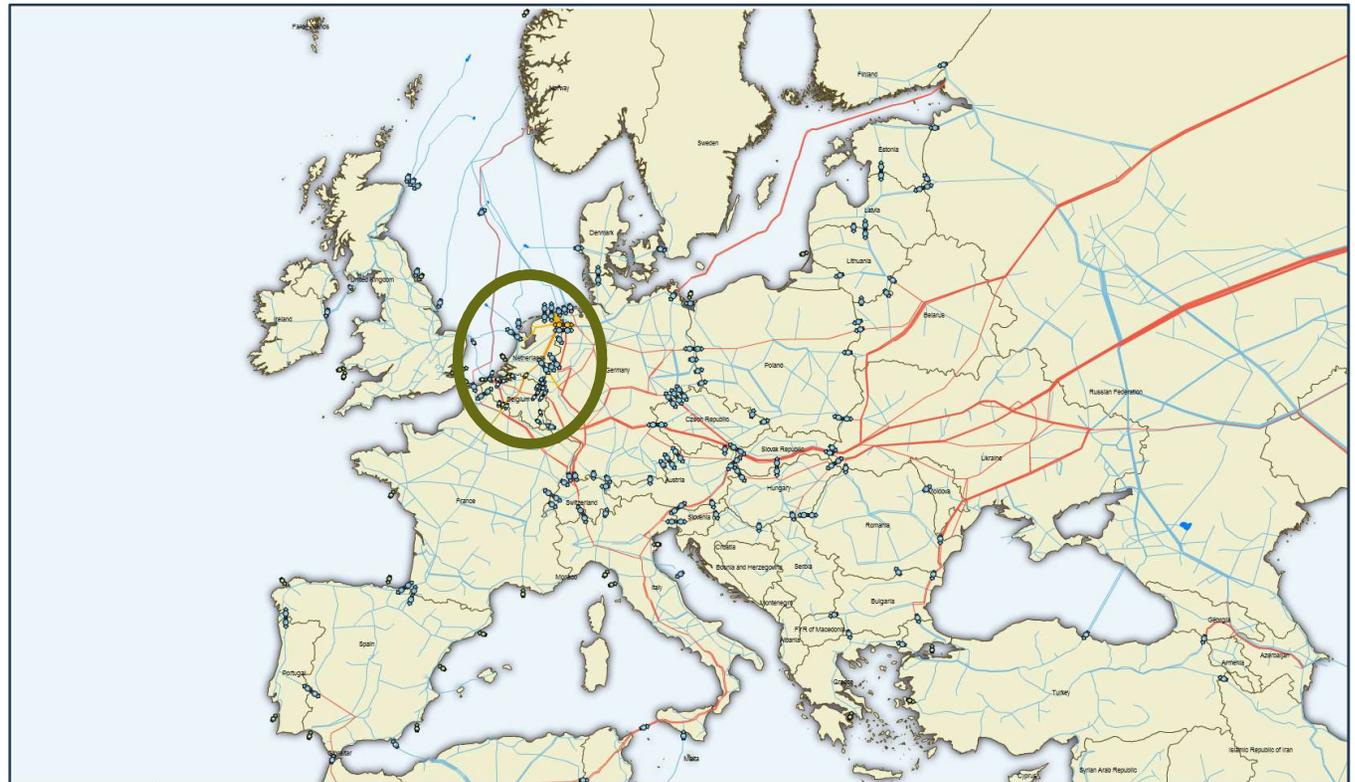
Dutch Connections

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The European gas pipeline network

Extensive gas infrastructure exists in Europe facilitating a very liquid gas market
Large trunk lines are needed for imports from Norway and Russia.
LNG terminals are insufficient to cover import requirements

The Netherlands is strategically positioned, connections with all European markets are in place

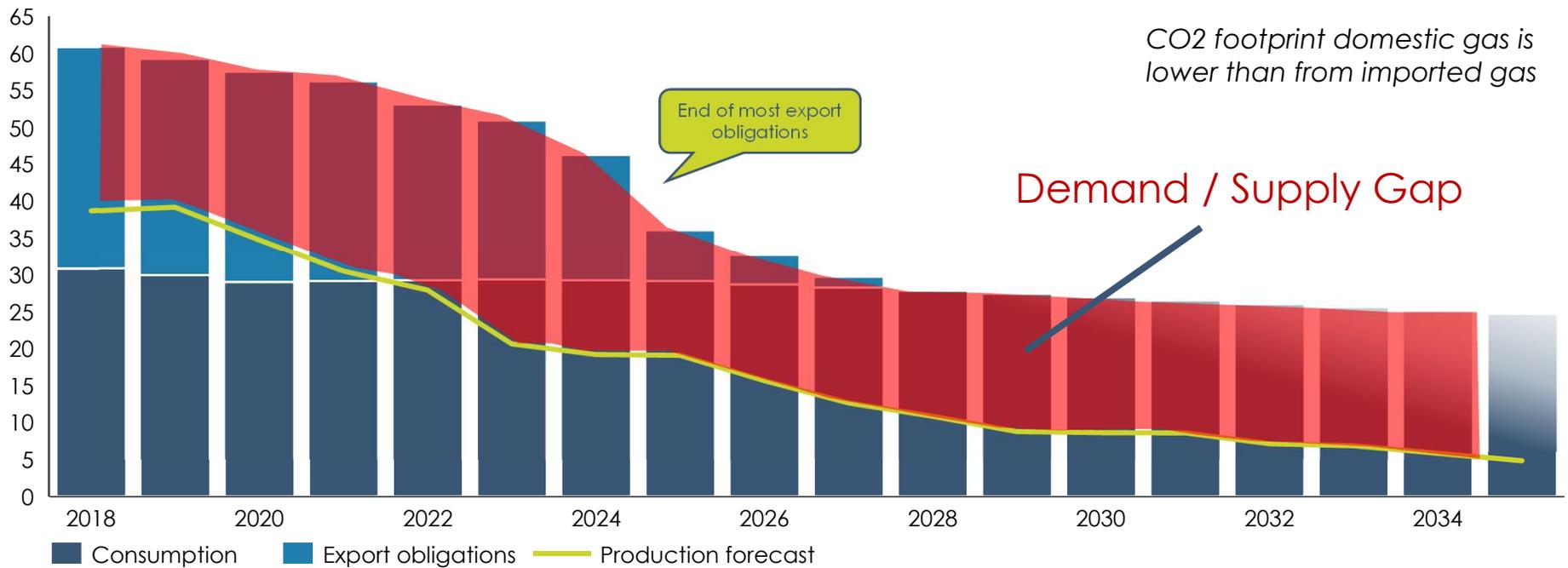


Dutch Deficit

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EBN wants to attract investment in underexplored areas to increase production and reduce the gap between gas production and demand during the energy transition

Forecast of gas production and demand in the Netherlands (Bcm)



Source: EBN analysis

www.ebn.nl



Data: NLOG, July 2015

EBN: Dutch State participant

- Industry partner & Co-investor in Oil, Gas & Geothermal
- Non-operating partner (40-50%) for oil & gas companies
- Shares held by the Dutch State

2018 results:



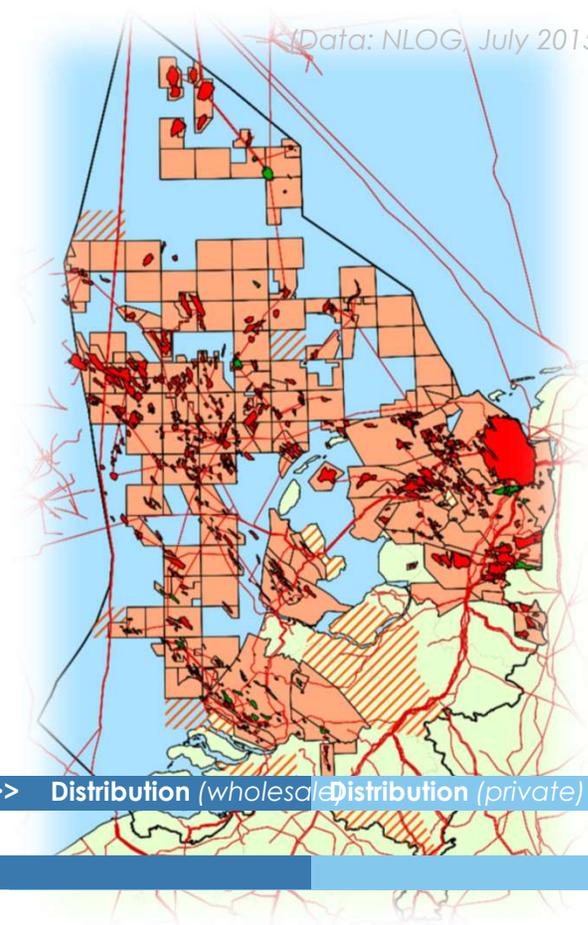
14 bln Nm³
~490 Bcf



2.3 mln bbl

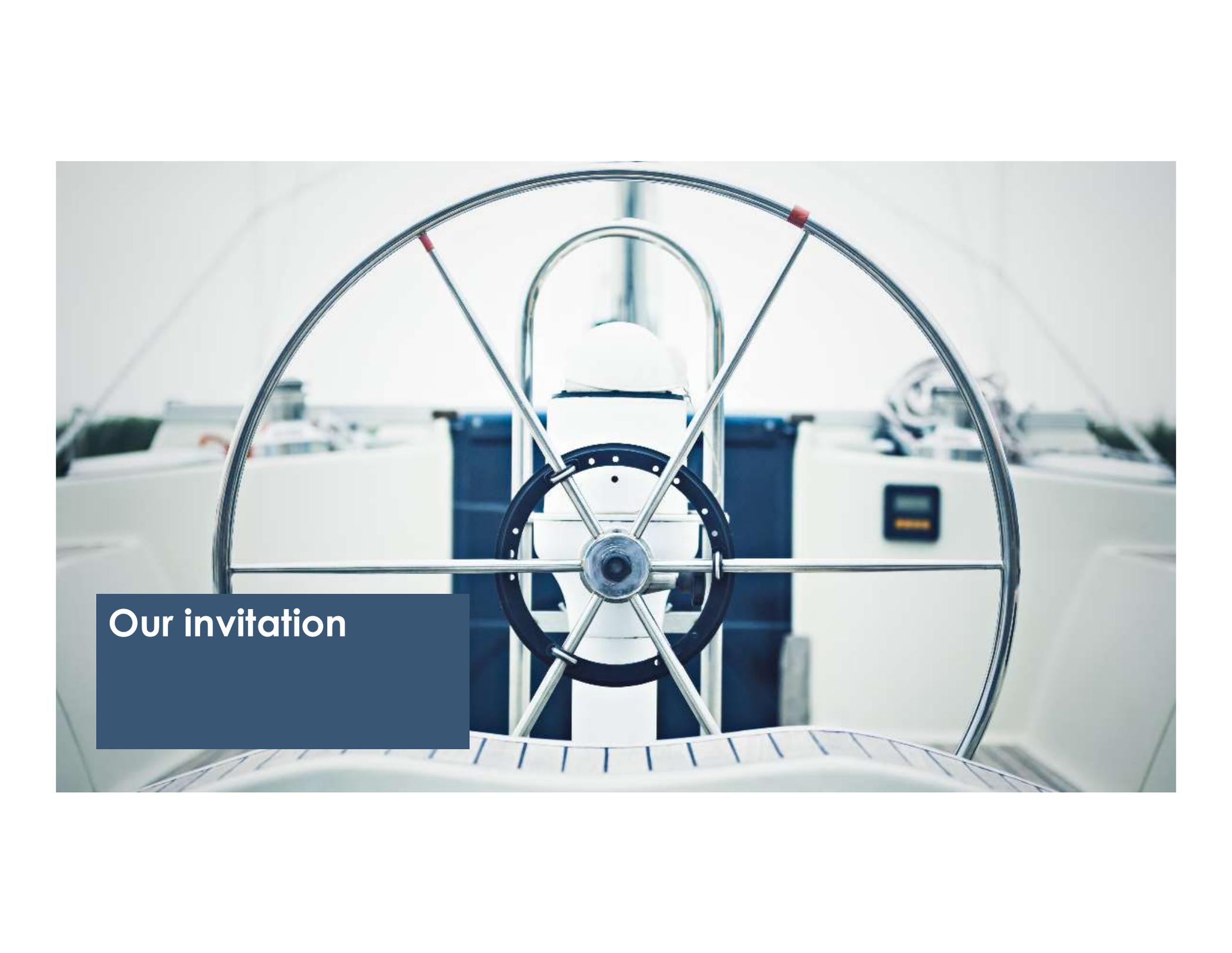


€ 962 mln
State revenues



Exploration >> Production >> Gas storage >> Distribution (wholesale) Distribution (private)

EBN's influence and responsibilities



Our invitation

EBN's invitation

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EBN derisks exploration, provides credibility in the market and a superior credit rating whilst sharing knowledge and experience

EBN value propositions



Note: 1. Additionally, EBN also releases generic Dutch mining data to the public via www.nlog.nl
Source: EBN analysis

www.ebn.nl



EBN's invitation

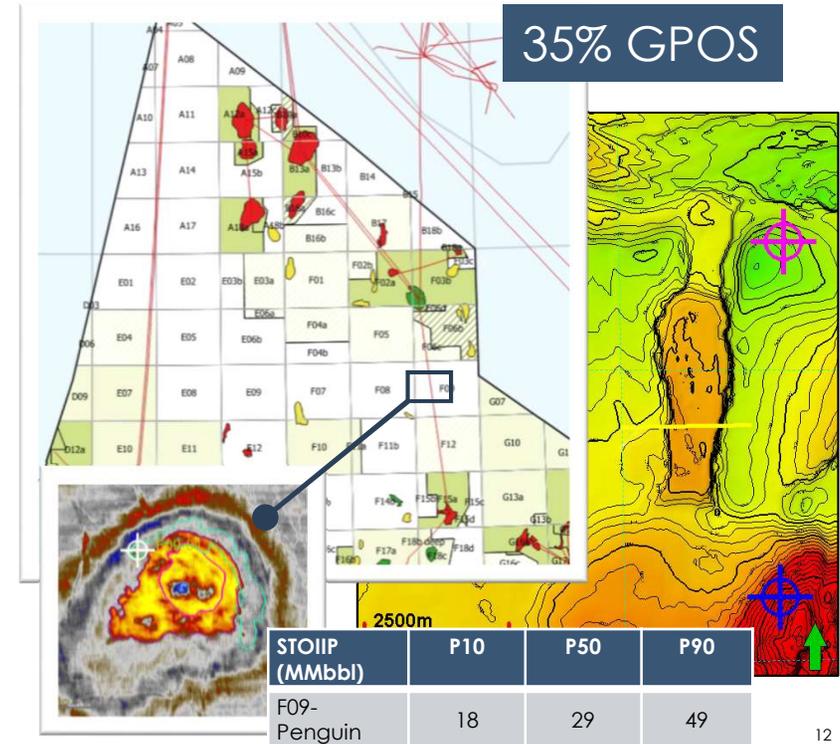
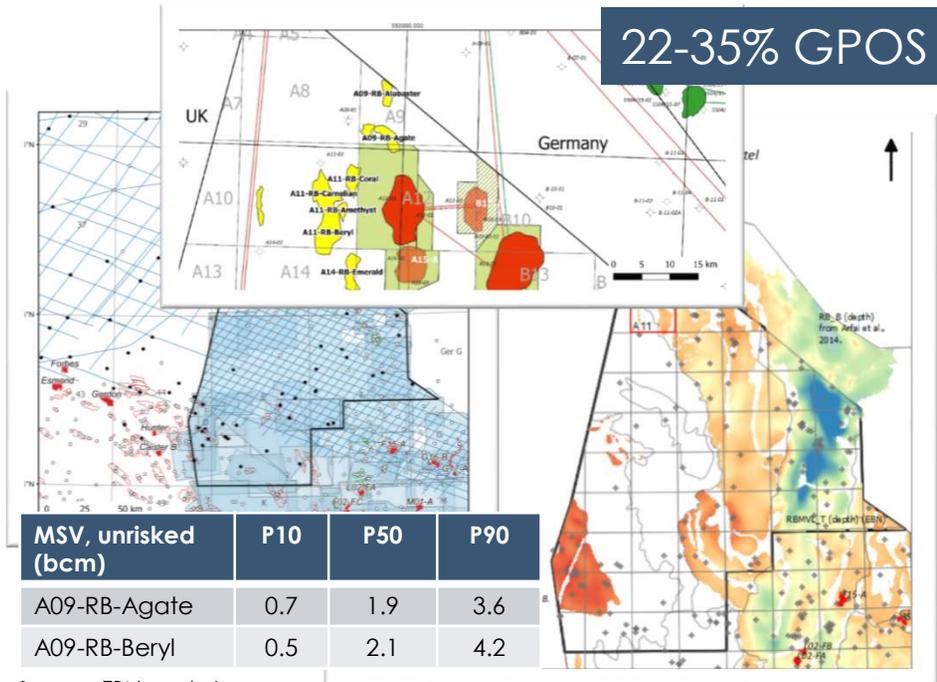
Available on request

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EBN has prepared sample teasers for high POS, clustering exploration opportunities in unlicensed, underexplored areas in proximity to infrastructure

Triassic plays (e.g. A09-RB-Agate & A11-RB-Beryl)

Shallow plays (F09-P06 & F09-Stelvio)



Source: EBN analysis

www.ebn.nl



**Business case for
investment in the
Dutch basin**

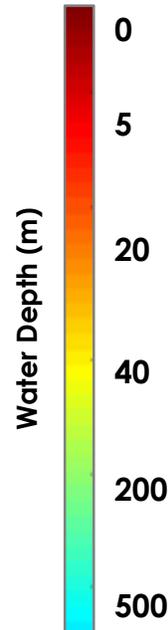
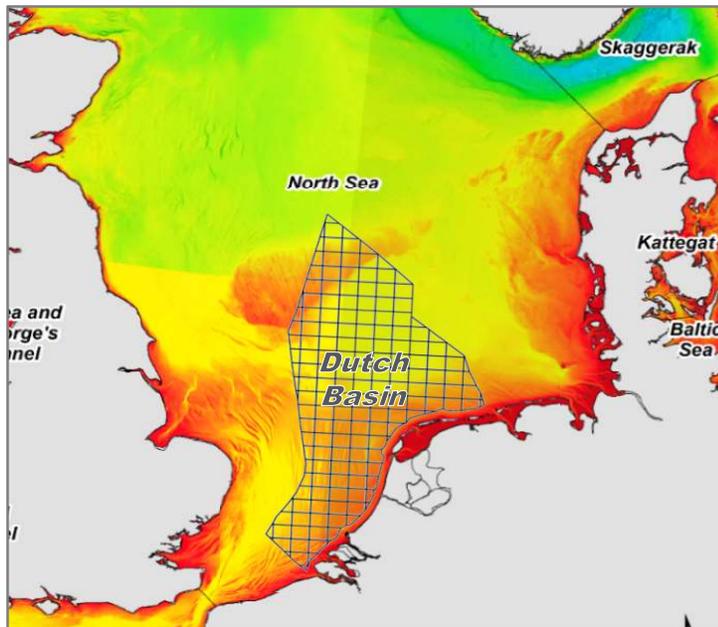


Favorable prospectivity

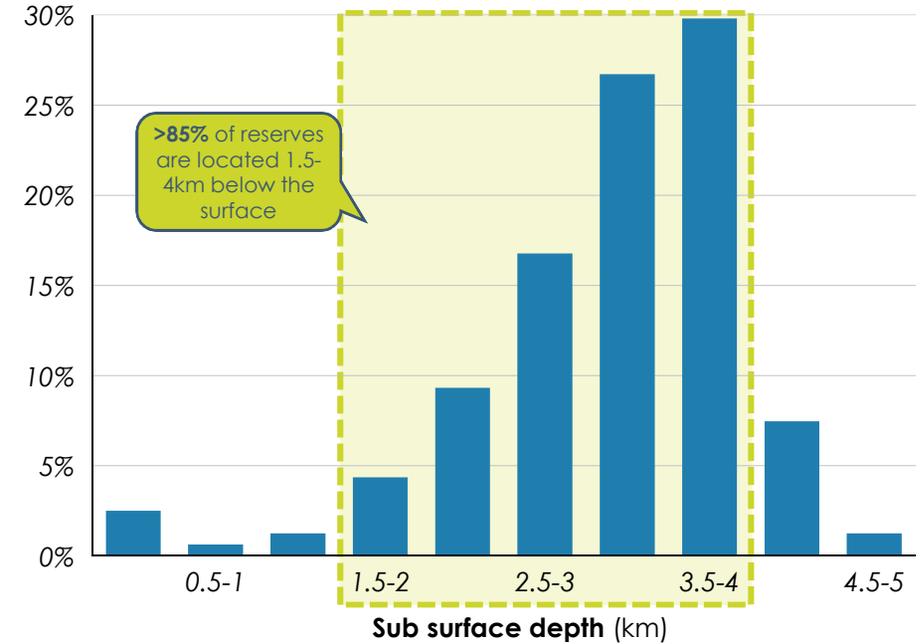
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Prospectivity in the Netherlands offers low risk investment requiring minimal investment in shallow water and shallow subsurface...

Bathymetry of the Southern North Sea



Subsurface depth of Dutch offshore gas reserves



Source: EBN; NLOG

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Favorable prospectivity

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...meaning production can be performed through relatively low-cost, small modern platforms

Modern Dutch (gas) production platforms

No expensive helicopter flights but W2W



Built by HSM Offshore BV,
2017, Schiedam, the
Netherlands

Location North Sea block L13.
Dimensions:
Topside 13,5x13,5x15,0 m.
Monotower dia. 4,5/3,5 m. x 50 m.
Monopile dia. 4,5 m. x ong. 40 m.
Weight topside 255 ton
Monotower 312 ton
Monopile 360 ton

Source: EBN annual publication Focus 2018

www.ebn.nl

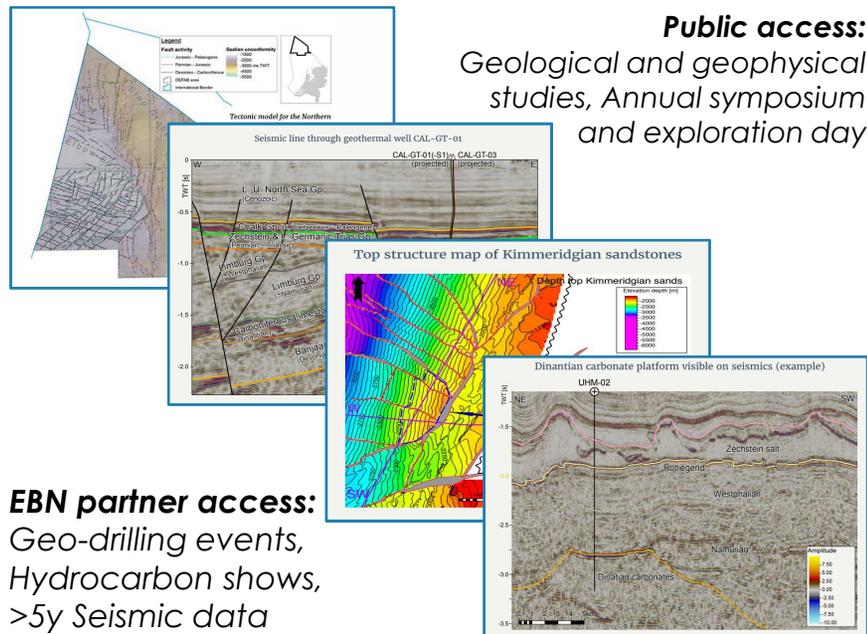
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Favorable prospectivity

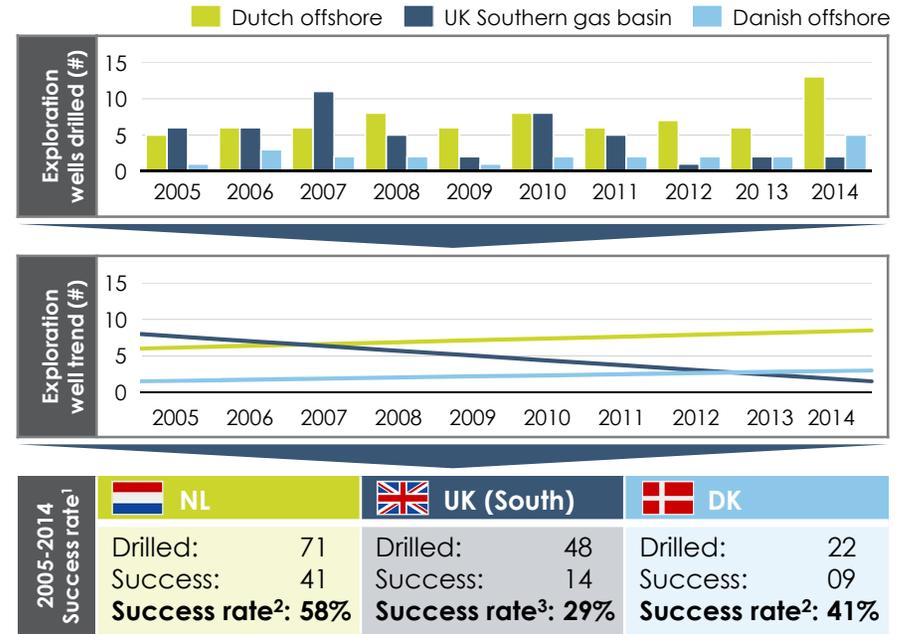
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Whilst the highest success rate in the Southern North Sea is supported by free access & analysis of rich exploration data

Examples of high quality data sharing



Intensity and success rate of SNS exploration



Note: 1. 2005-2014; 2. Rate of economic success, relevant factors project dependent; 3. Rate of 'significant discoveries' (i.e. production tests yielded more than 400,000 m3/d)
Source: EBN; NLOG

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Favorable prospectivity

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EBN continuously performs geological and geophysical research and uses proprietary models to locate new resources and screen them for economic viability

EBN studies

- EBN uses the proprietary ExploSim and InfraSim models to test the **economic viability** of currently known prospects based on **costs**, prognosed **gas prices**, existing **infrastructure** constraints, and platform **CoP predictions**
- Using the **Play Based Exploration** method, EBN is continuously **adding prospective resources**

Plays/reservoirs

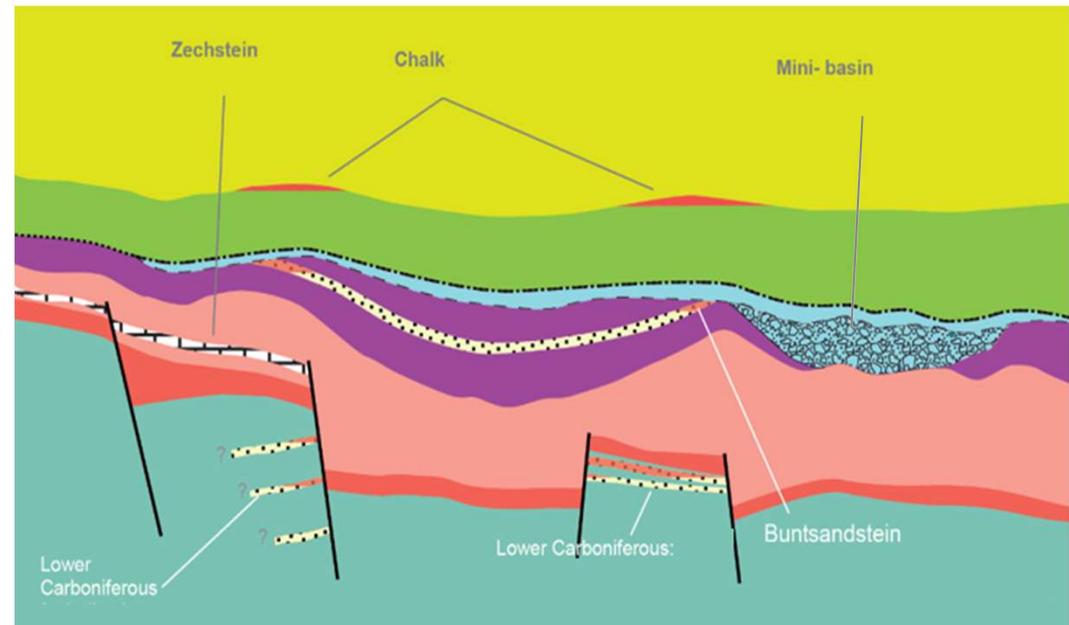
- Tertiary - Shallow gas
- Chalk
- Upper Jurassic - Lower Cretaceous
- Triassic
- Carboniferous - Lower Carboniferous & Dinantian

Source: EBN

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Examples of Dutch plays

NON-EXHAUSTIVE



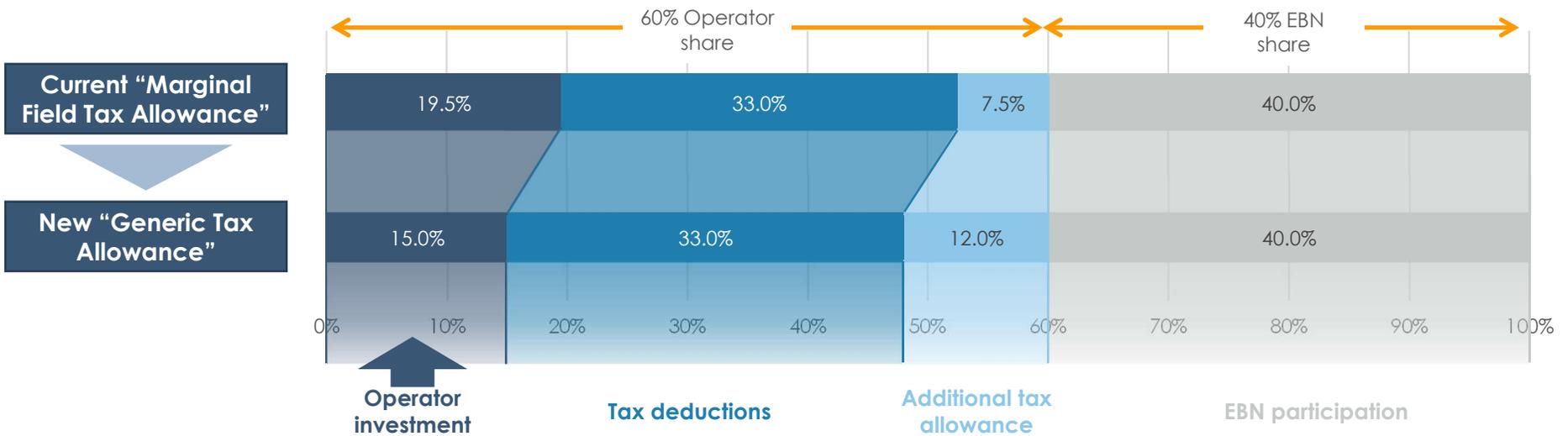
Generous tax allowance

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Operators will only bear 15% of exploration investment costs due to an updated tax allowance (expected end of 2019)

Operator's exploration investment burden

- **EBN invests 40%**
- The new tax allowance **reduces operator investment to 15% of total investment**



Source: EBN analysis

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Supportive E&P ecosystem

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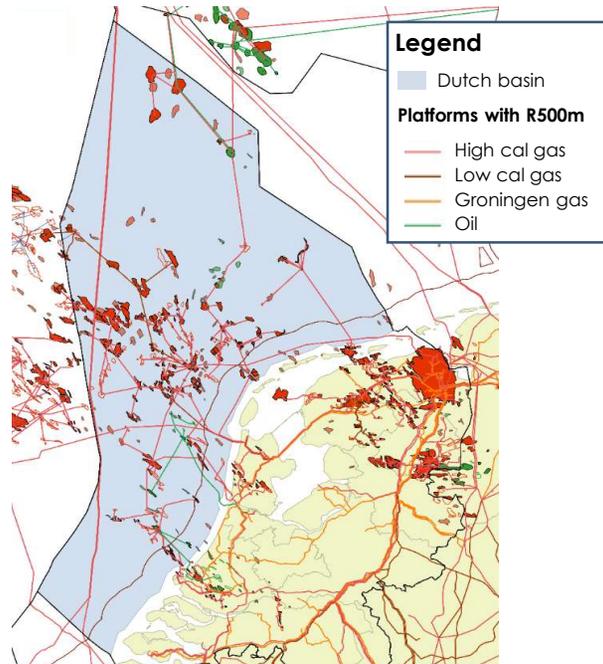
The Dutch basin hosts extensive infrastructure and a mature service industry

Infrastructure and service providers in Dutch basin

Drilling

Materials and equipment

Offshore installations



Construction, shipbuilding & repair

Transport and logistics

Seismic and hydrographic surveys

Source: Association of Dutch Upstream O&G Suppliers (IRO); EBN analysis

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Stable regulatory environment

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Whilst the Government of the Netherlands offers its full support

Summary of excerpts from the Ministry of Economic Affairs and Climate



Government of the Netherlands

Our Dutch gas ...

...benefits the climate:

- *"Carbon footprint of imported gas is higher"*
- *"Methane emission within Dutch gas chain is lower than for other countries"*

...benefits the economy:

- *"Increases economic activity and job security"*
- *"Yields monetary benefits to the Dutch state"*



Government of the Netherlands

Our Dutch gas ...

...drives the energy transition:

- *"This growth and development of knowledge and infrastructure related to gas exploration is of vital importance"*
- *"It drives further developments in geothermal energy and subsurface carbon storage"*

...safeguards the energy supply:

- *"We should be able to obtain natural gas without large dependencies on foreign suppliers"*

Stable regulatory environment

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The Netherlands operates an Open Door policy meaning that applications for licenses can be applied for at any time

Netherlands Application Process

Phase 1: Surveying

Generally no permits required for offshore seismic surveys¹

Notification of seismic survey

- Notification of desire to carry out a seismic survey to the Inspector-General of Mines (4 weeks in advance)
- Disclosure of survey program, including details on which surveys will take place, where and when

Publication of seismic survey results

- Communication of results within 1 year of seismic survey completion

Phase 2: Prospecting

Year-round license application process

Submission of license application at the Ministry, including:

- Indication of area and time period
- Documentation regarding company data
- Geological report
- Detailed work plan (*within 4 weeks after submission*)

Consideration of application

- Invite to third parties to submit competing applications
- Consultation of the State Supervision of Mines and Mining Advisory Council

Notification of approval

Entry into agreements with EBN/other partners

 Operator responsible  Ministry responsible

1. Separate permission is only required when there are also nature, shipping or defence interests in the areas concerned
Source: EBN

Business case for Dutch exploration

The business case for investment in the Netherlands is primarily driven by the country's favorable prospectivity, generous tax allowances and mature ecosystem

Why explore in the Netherlands

- **EBN as your partner** invests, facilitates and shares knowledge
- Favorable prospectivity in shallow water and subsurface includes **many underexplored areas**, and the highest success rate in the area
- Your **financial exposure** on exploration activities is **reduced to 15% through tax allowance and co-investment**
- **Guaranteed offtake** and **mature infrastructure**
- **Stable** and internationally oriented **investment climate**

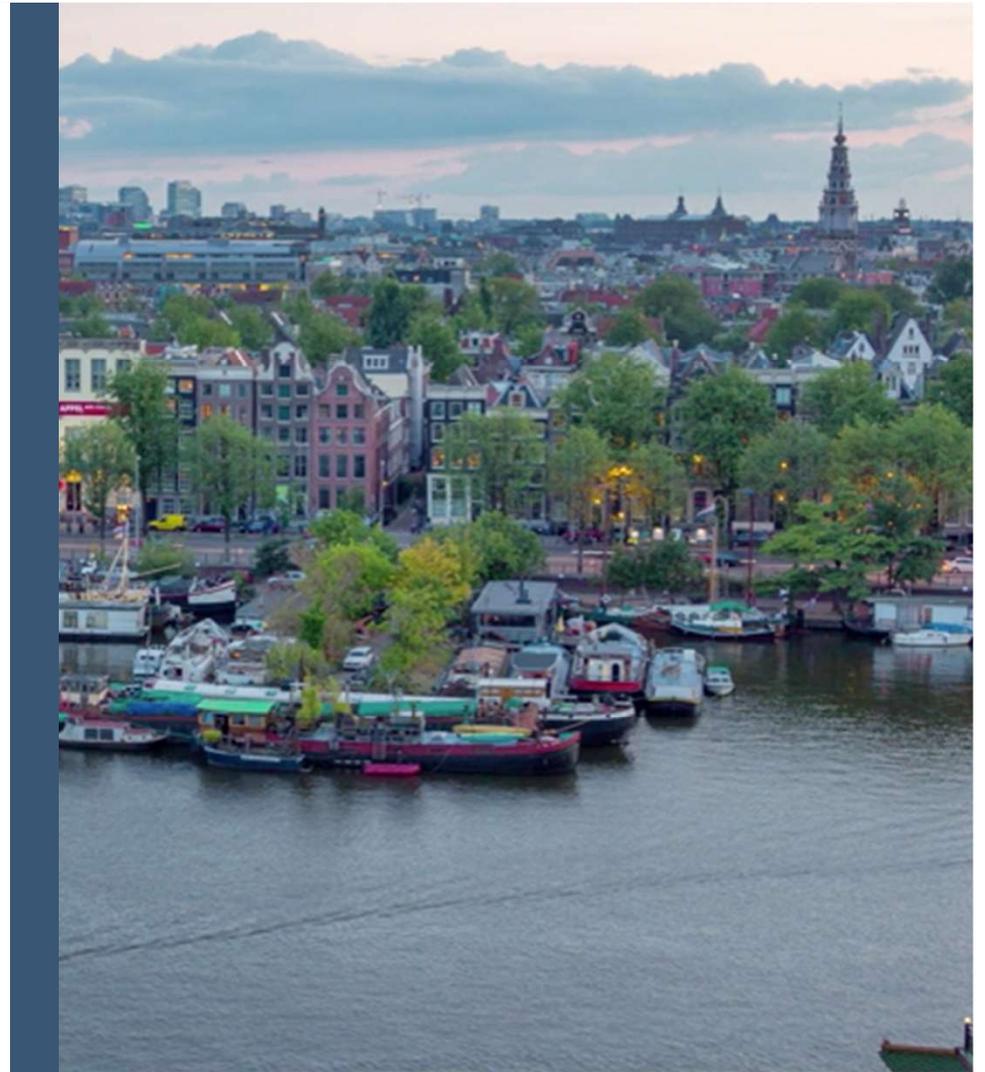


The Netherlands
- A Sea of Opportunity -

Brochure available

Thank you for your
attention

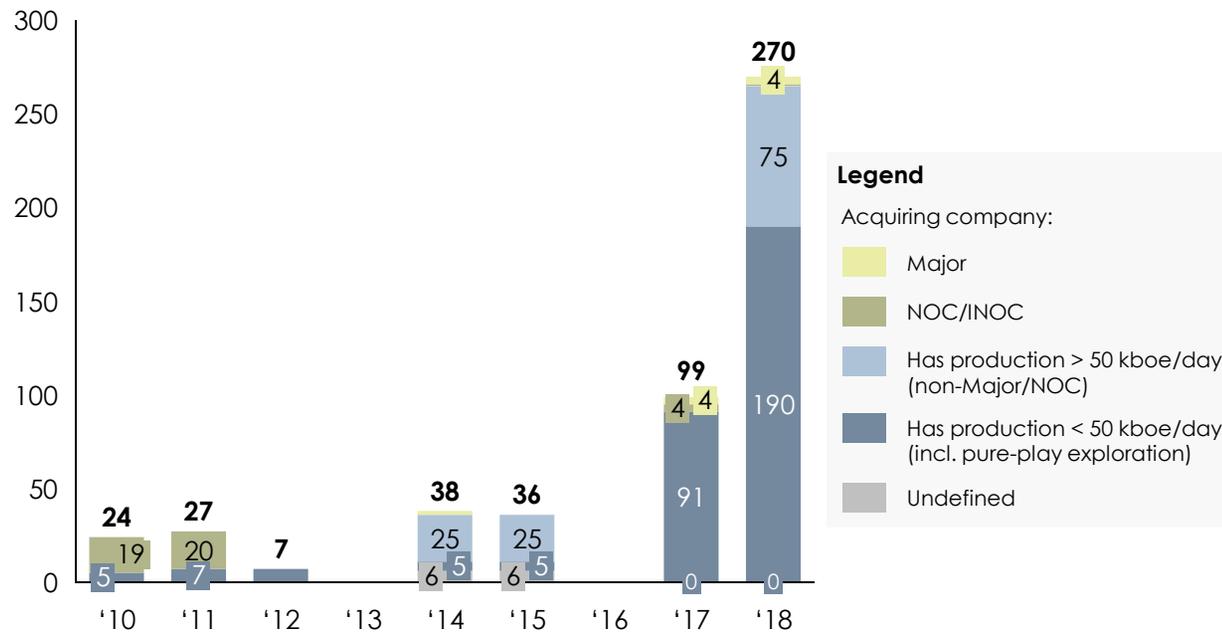
Contacts: eric.ewijk-van@ebn.nl
exploration@ebn.nl
www.ebn.nl



Attractive Basin

The Dutch basin typically offers very strong yields for marginal set up costs, prompting small - mid-sized players to enter the basin in recent years

Activity in the Dutch basin (# transactions incl. share purchases)



Source: Rystad Energy, EBN analysis

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Observations

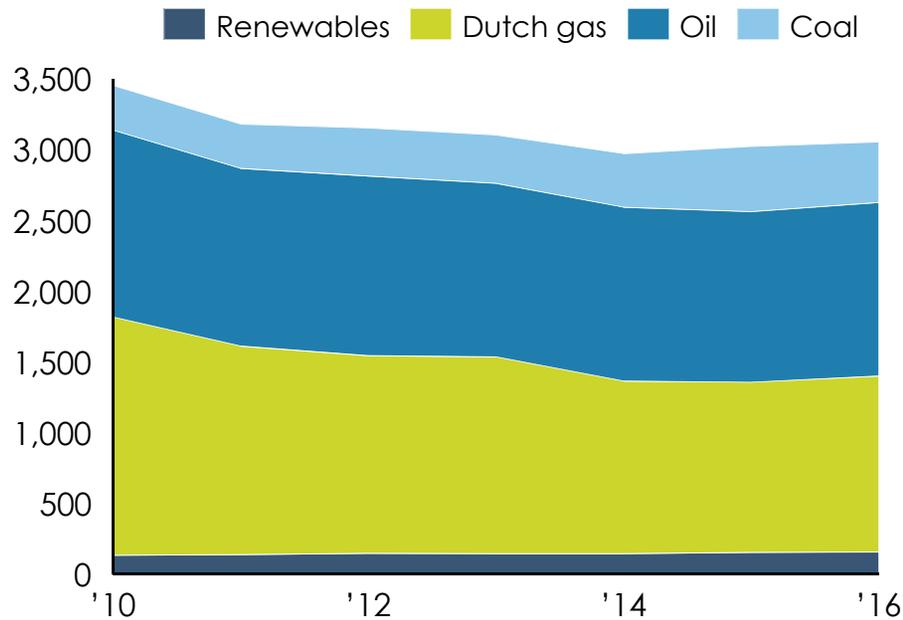
- Recent years show a **steep increase** in acquisition **activity** in the Dutch basin
- This trend is primarily driven by the **large number** of **transactions** undertaken by **small – mid-sized** E&P and exploration **companies**
- This is leading to **increased incidence** of these **small – mid-sized players**, as they are **acquiring** primarily **from** companies with **high production volume**

Guaranteed downstream offtake

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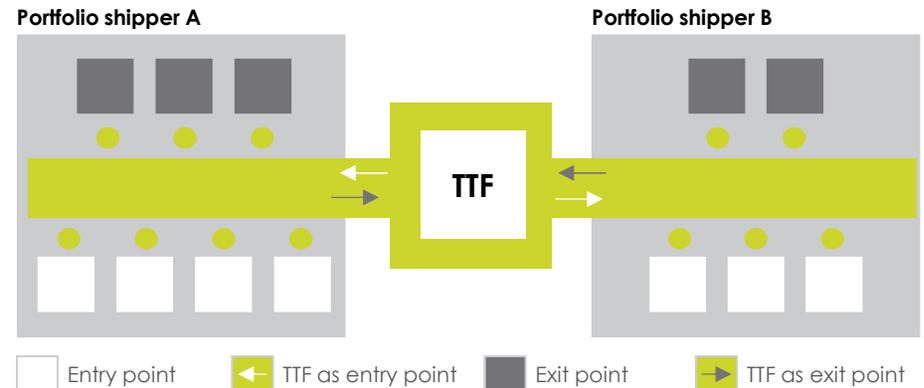
The Netherlands provides a mature market with stable consumption and EBN can facilitate downstream access with its 40% stake in gas wholesaler GasTerra B.V.

Energy consumption (PJ)



Facilitated downstream access through TTF

- The Title Transfer Facility (TTF) is a **virtual market place** where market parties have the opportunity to **transfer gas** that is already present in our system ('entry-paid gas') to another party
- GasTerra B.V. is obliged to **purchase all volumes** against competitive market rates in this system



Source: CBS; GasUnie transport services

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