BASF and Shale Gas

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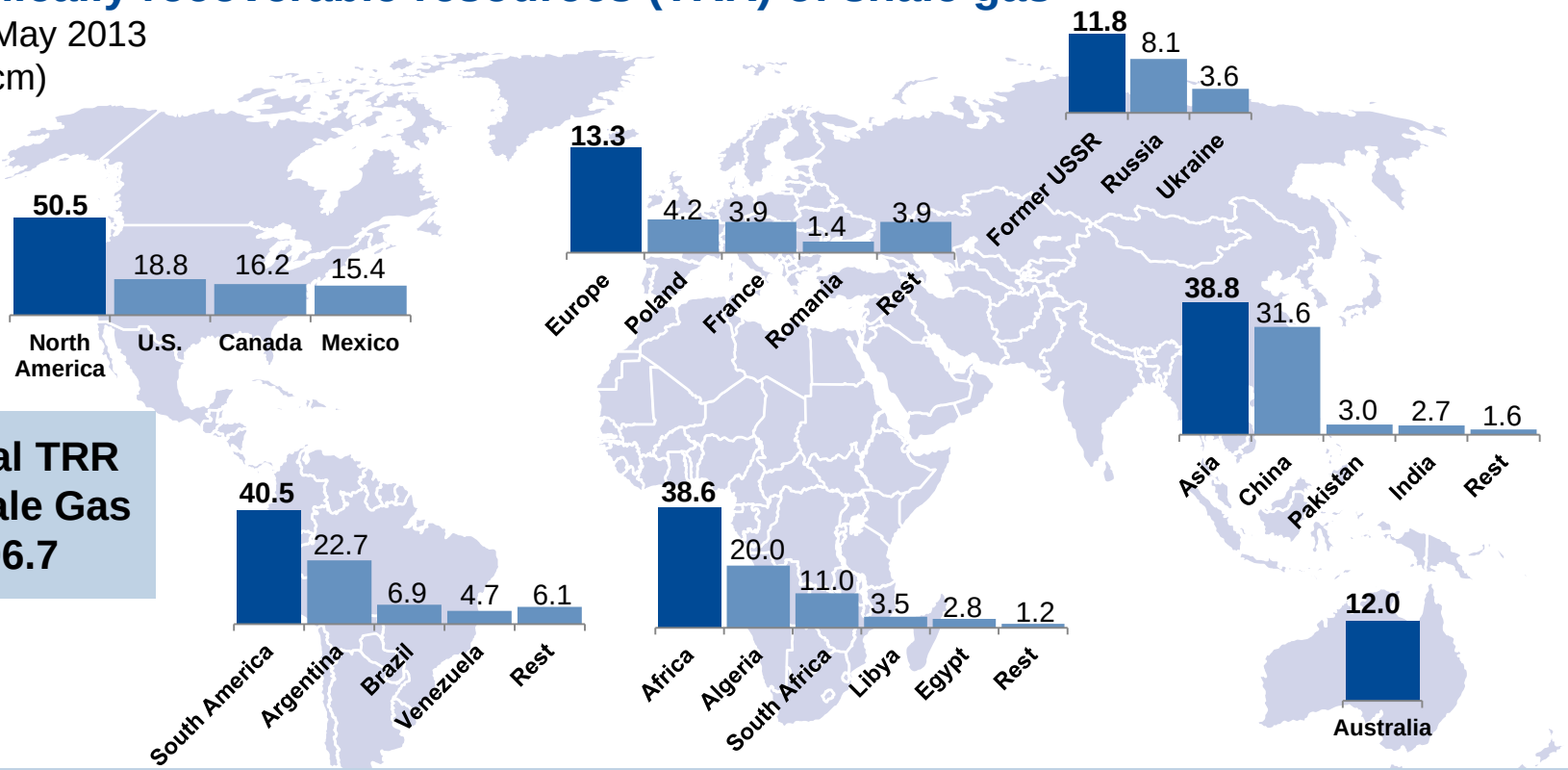
Roland Merger, GRD/B

Global Shale Gas Resources

There is plenty of shale gas

Technically recoverable resources (TRR) of shale gas

Status May 2013
('000 bcm)



Global TRR of Shale Gas 206.7

- Estimates of shale gas resources are often uncertain and changing
- TRR of shale gas does not mean that the resources are also economically feasible to recover

* Middle East only includes assessment of Turkey and Jordan; other Middle East & Caspian countries are excluded, but could hold significant resources.

Source: EIA, June 2013

BASF segments

Chemicals

- Petrochemicals
- Monomers
- Intermediates

Performance Products

- Dispersions & Pigments
- Care Chemicals
- Nutrition & Health
- Paper Chemicals
- Performance Chemicals

Functional Materials & Solutions

- Catalysts
- Construction Chemicals
- Coatings
- Performance Materials

Agricultural Solutions

- Crop Protection

Oil & Gas

- Oil & Gas

BASF segments and shale gas

BASF is a consumer of natural gas

Chemicals

Petrochemicals

Monomers

Intermediates

Performance Products

Dispersions & Pigments

Care Chemicals

Nutrition &

Functional Materials & Solutions

Catalysts

Construction Chemicals

Coatings

Performance Materials

Agricultural Solutions

Crop Protection

Oil & Gas

Oil & Gas

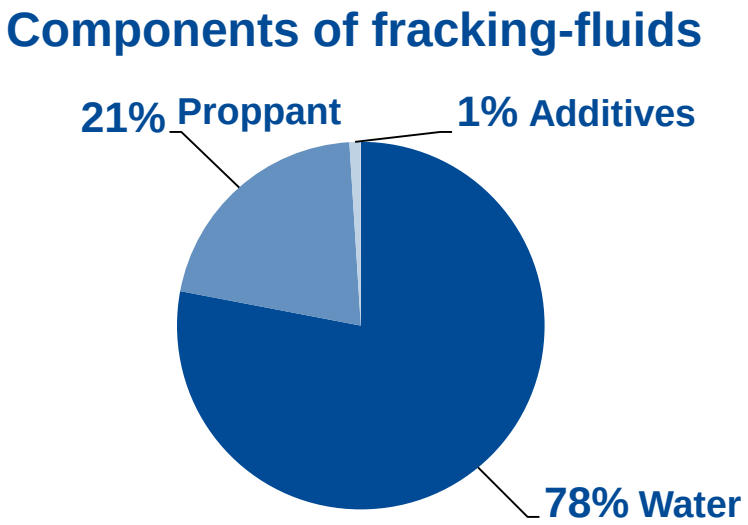
BASF products are used in shale gas production

BASF is a supplier of natural gas

BASF as a seller of chemicals

- BASF supplies chemicals into oil field service companies engaging in fracking

- BASF supplies single components:
  - Friction modifiers
  - Thickeners
  - Surfactants
  - Scale inhibitors
  - Biocides



These are used for the manufacture of fracking fluids.

BASF as supplier of Natural Gas

- E.g. Germany: 12% of natural gas from domestic production (declining)
- Assumed shale gas resources worth exploring
- Research whether shale gas production in Germany is feasible should be supported
- Hydraulic fracturing is well-established in conventional production 1/3 of conventional gas production requires fracking.
  No approvals in Germany since 2011, gas production is declining.
- **Wintershall** has 30 years of experience in hydraulic fracturing in Europe, Russia and Argentina

Wintershall
Set for further growth upstream

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Share of Oil & Gas in BASF portfolio

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Overview

Share of Oil & Gas in BASF portfolio

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Average EBITDA* 2009-2013
(€ billion)

Oil & Gas
2.3 (24%)

BASF Group w/o Oil & Gas
7.4 (76%)

Cumulative capex** (plant, property, equipment)
(€ billion)

Oil & Gas
6.4** (31%)

BASF Group w/o Oil & Gas
14.5 (69%)

Key facts

- 2009-2013:
  - Oil & Gas: Solid profit contributor to BASF Group
  - Oil & Gas accounted for 31% of BASF Group capex
- EBITDA share of Oil & Gas in BASF's portfolio expected to remain in the same order of magnitude in the upcoming years
- Capex share of Oil & Gas business in BASF portfolio will slightly decline

* Excluding non-deductible oil taxes **Fixed assets, tangible assets from acquisitions, activated exploration expenditures

Focus on Core regions

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Exploration & Production: Clear regional focus

Focus on Core regions

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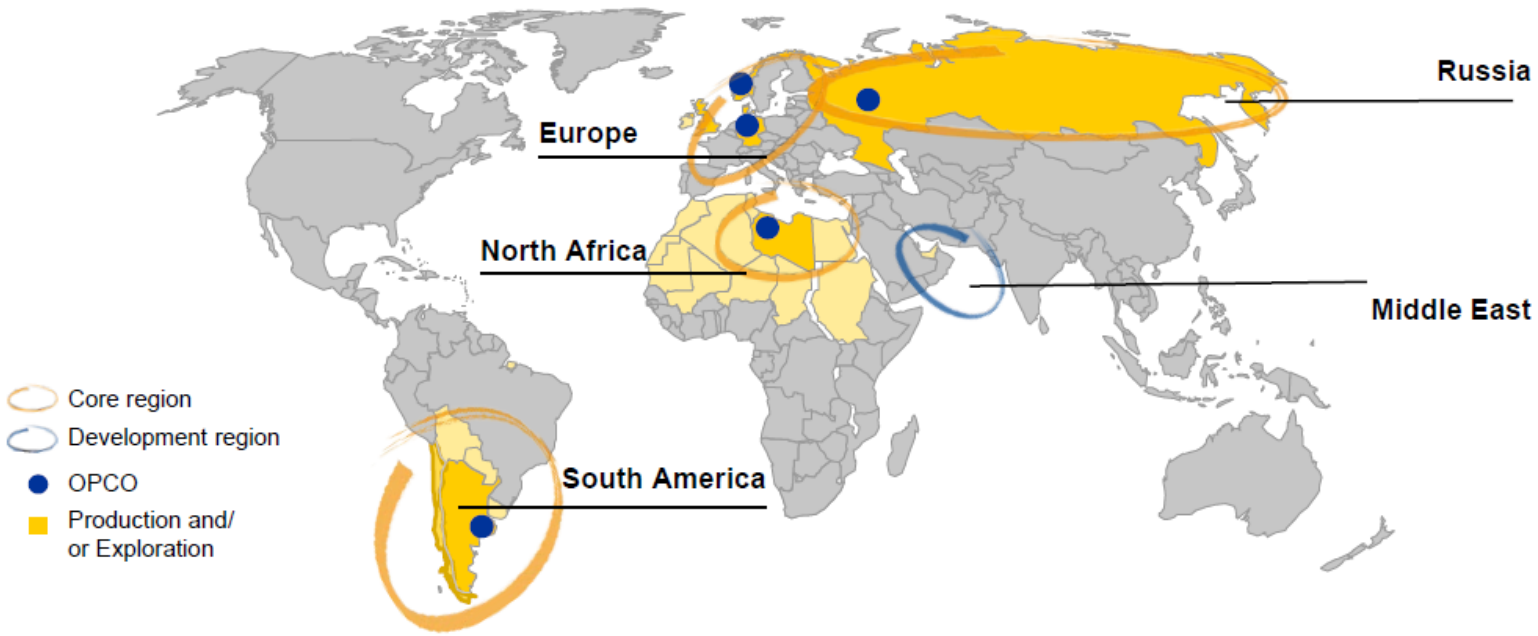

Increased security of supply for Europe

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Nord Stream

Increased security of supply for Europe

wintershall

Nord Stream offshore pipeline

- **Pipeline capacity:** 55 billion m³ per year via two 1,220 km subsea pipelines
- Successful gas deliveries since November 2011
- JV between Gazprom 51%, BASF/Wintershall and E.ON* 15.5% each, Gasunie* and GDF SUEZ* 9% each
- Total **BASF investment:** €1.15 billion

Nord Stream onshore

- System expansion: OPAL (October 2011), NEL (October 2012)
- Increased transportation capacity to NL, B, F, CZ through system upgrade including storage Jemgum
- Germany as distribution hub for Europe
- Total **BASF investment:** €1.15 billion

* Indirect through subsidiary companies

Securing the supply of South Europe

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South Stream

Securing the supply of South Europe

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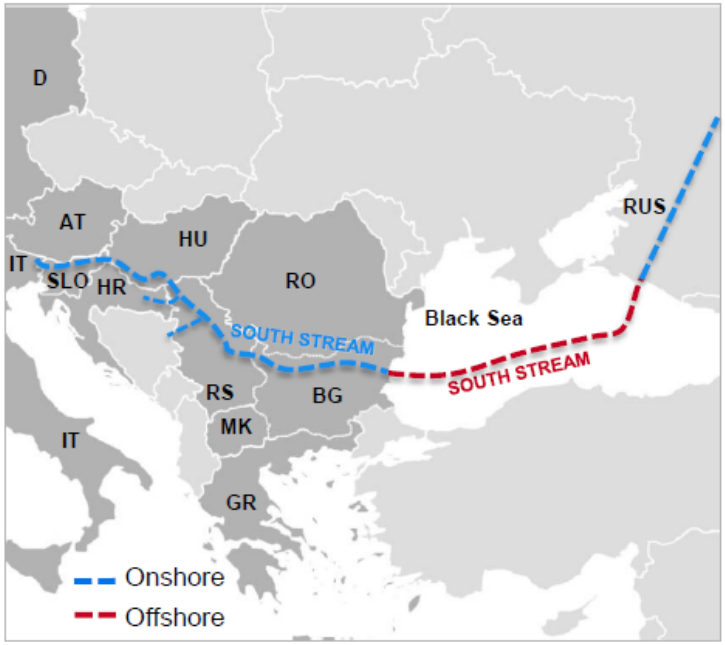
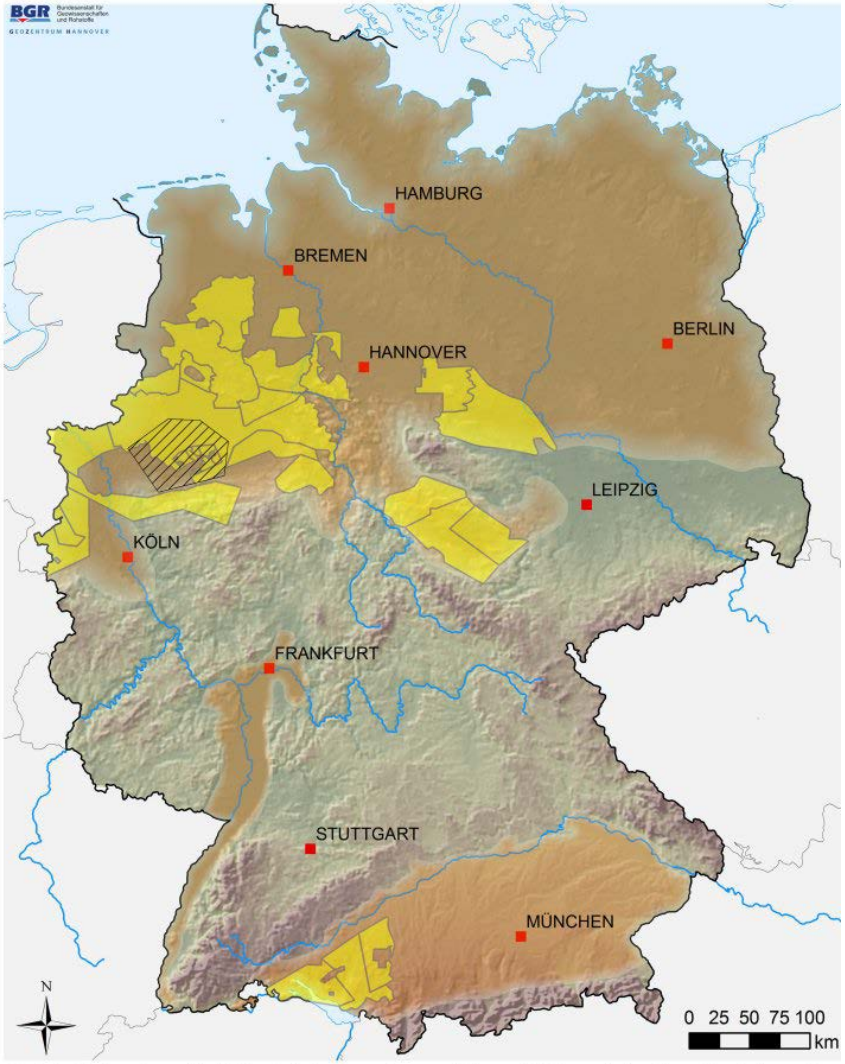


Key facts

- Wintershall acquired 15% stake in South Stream
- South Stream consortium to develop, construct and operate the offshore section of South Stream
- First direct connection of Southern Europe to the world's largest natural gas reserves in Russia
- **Total investment (offshore):**
  ~ € 10 billion
- **Planned capacity:**
  63 billion m^3 p.a. via 4 parallel pipelines each ~ 930 km
- Start-up: End of 2015 earliest

BASF as supplier of Natural Gas



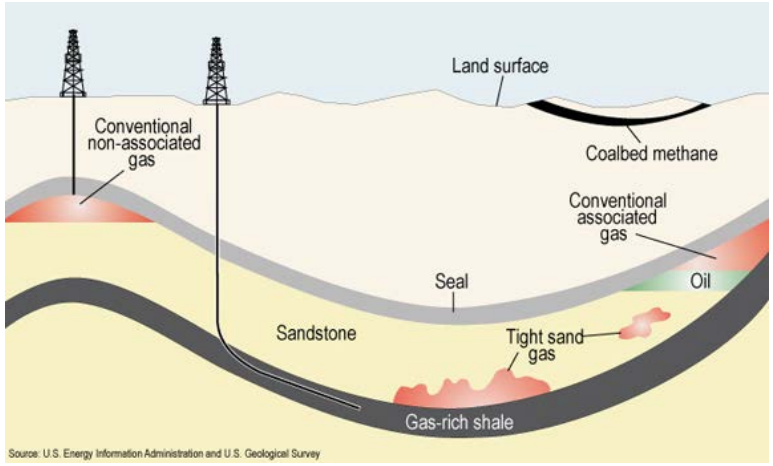
Shale Gas in Germany

- Resource estimates: 700-2300 bcm
- Equivalent to 13 years of German demand or :
- Keep current domestic production level for another 100 years

Quelle: Bundesanstalt für Geowissenschaften und Rohstoffe Hannover

Shale gas production techniques and possible environmental hazards

- Combination of two established technologies: horizontal drilling and hydraulic fracturing.
- Shale reservoirs are generally deep below surface and groundwater layers.
- Water, sand and additives are pumped at pressure into the shale, opening up hairline fractures that allow gas to flow.
- Thousands of meters of impermeable rock separate fractures from drinking water aquifers.
- Fractures cannot propagate to the surface.



Quelle: US Energy Information Administration and US Geological Survey

Wintershall is acting responsibly

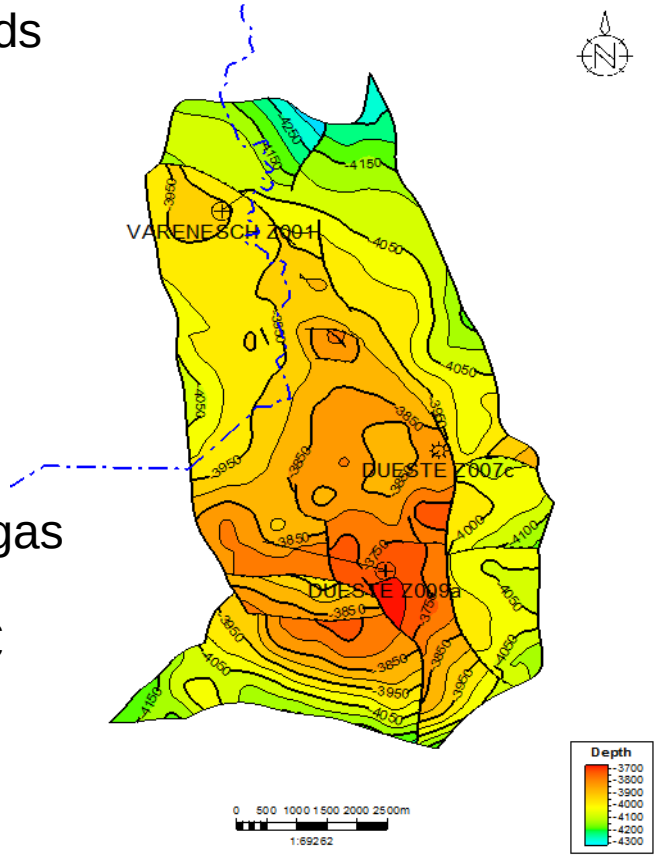
- Information on all projects on „**www.heimische-foerderung.de**“
- Self-Commitment to Maximum of Transparency and Safety

Wintershall Selbstverpflichtung für heimische Förderung

Wintershall ist Deutschlands größter Erdöl- und Erdgasproduzent. Wir fördern seit mehr als 80 Jahren Energie. Wir verpflichten uns generell, die Auswirkungen unserer Tätigkeit auf Menschen und Umwelt kontinuierlich zu minimieren. Um auch als Betriebsführer bei der Förderung insbesondere aus unkonventionellen Lagerstätten ein Höchstmaß an Sicherheit zu garantieren, bekennen wir uns mit der 2011 verabschiedeten Wintershall Selbstverpflichtung zu einem Maximum an Transparenz und Umweltschutz. Für uns gilt: Wirtschaftliche Interessen haben keinen Vorrang gegenüber Gesundheits-, Arbeits- oder Umweltschutz.

Düste Z10
The model project

- **Geological target:** carboniferous tight gas sands
- **Realization:** 4380 m of vertical drilling
  Extensive data collection
  Fracking required
- **Potential Z10:** up to 870 mil m³ of natural gas production,
  investment approx. 30 mil €
- **Total potential „Düste Karbon“:** 20-40 bcm natural gas
  thereof 25% recoverable
  (best case)

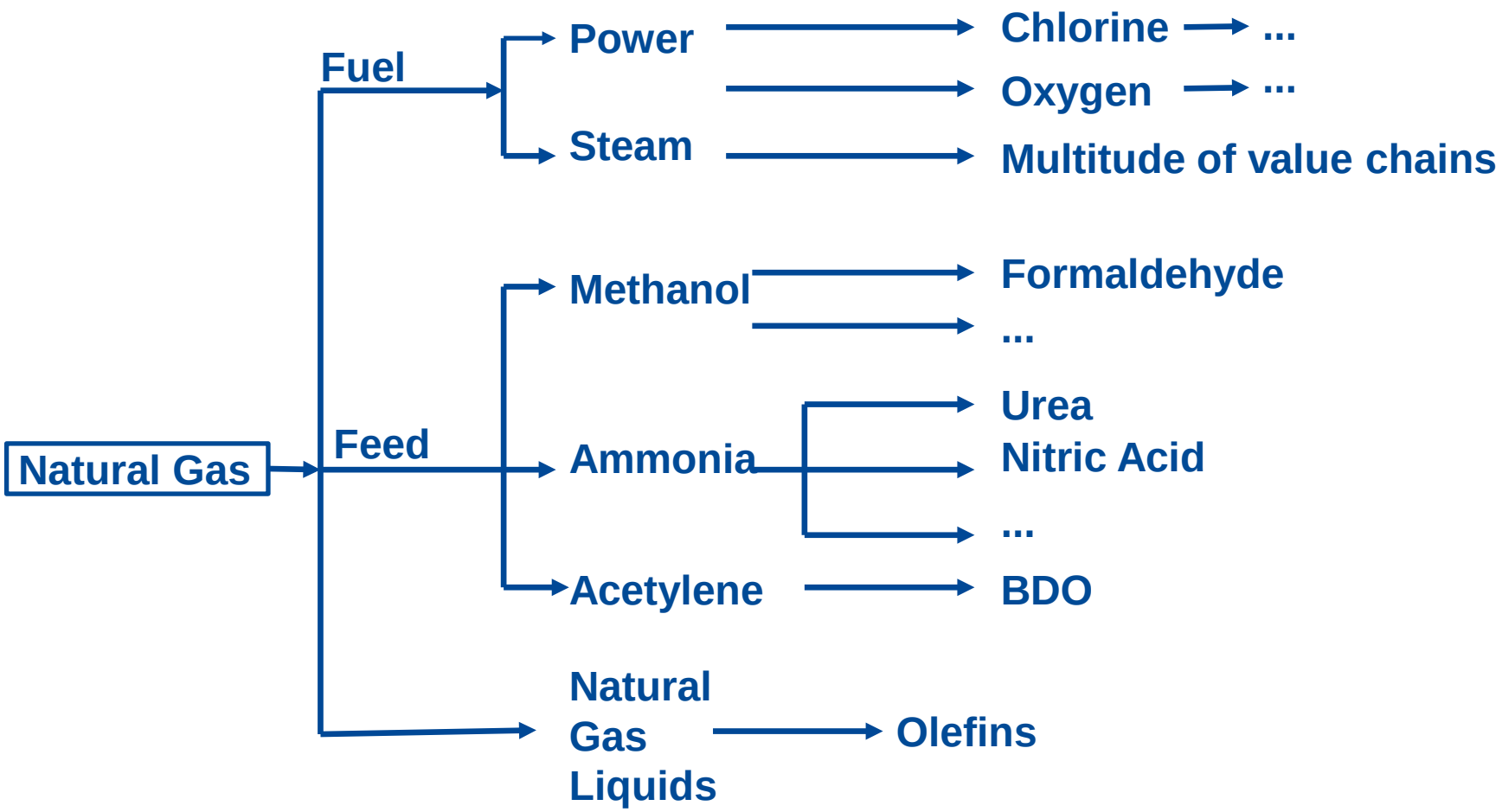


Quelle: wintershall Wir fördern Zukunft.

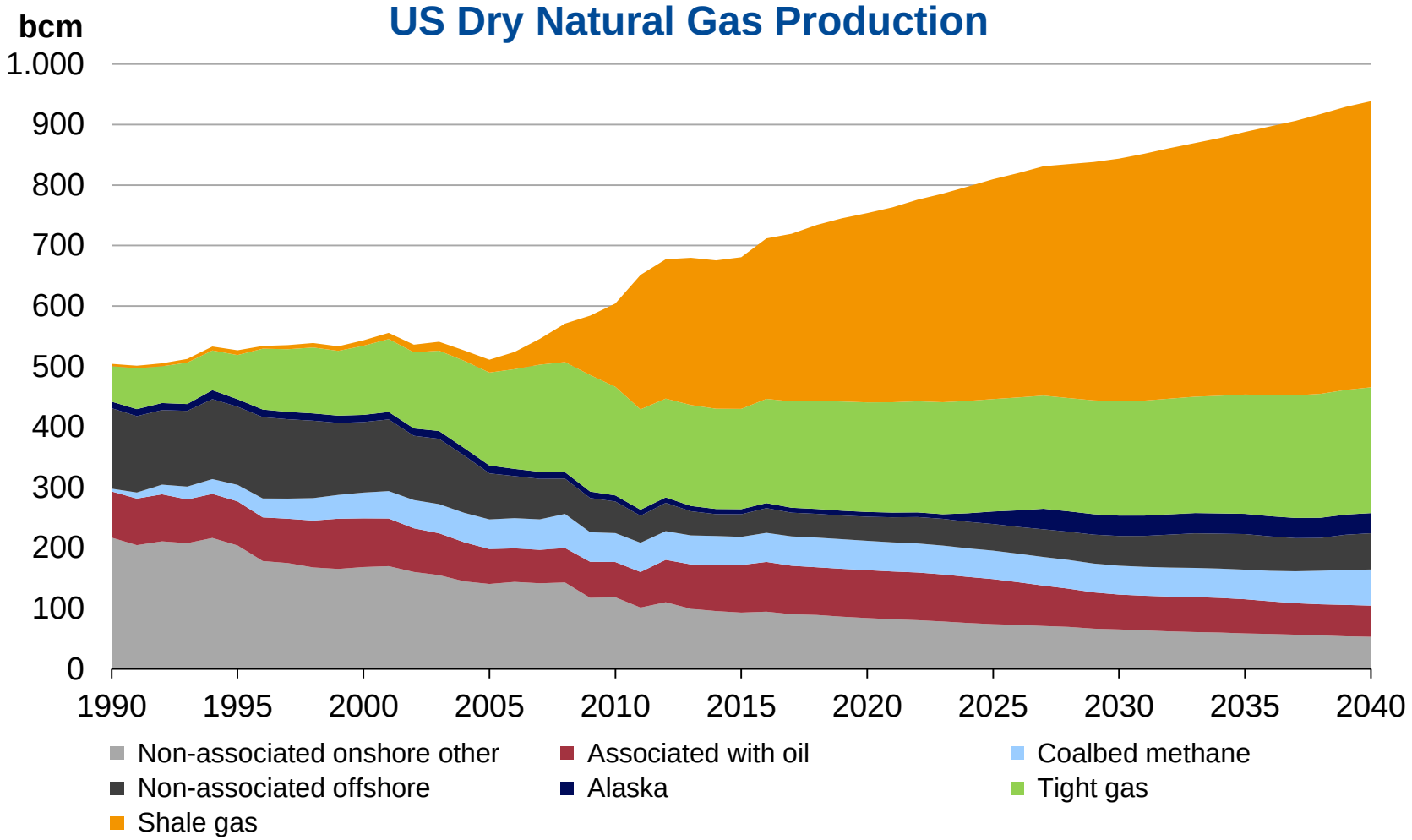
BASF as a Natural Gas Consumer

- natural gas is the basis for a multitude of chemical value chains
- investment decisions in the chemical industry largely depend on raw material situation
- low natural gas cost in US support C1-based and energy-intensive value chains

BASF as a Natural Gas Consumer



What is BASF doing in the US?



Source: EIA AEO 2013

Geismar, LA

2012: **New Methylamine Plant** Geismar, LA

2014: World scale **Formic Acid plant** Geismar, LA

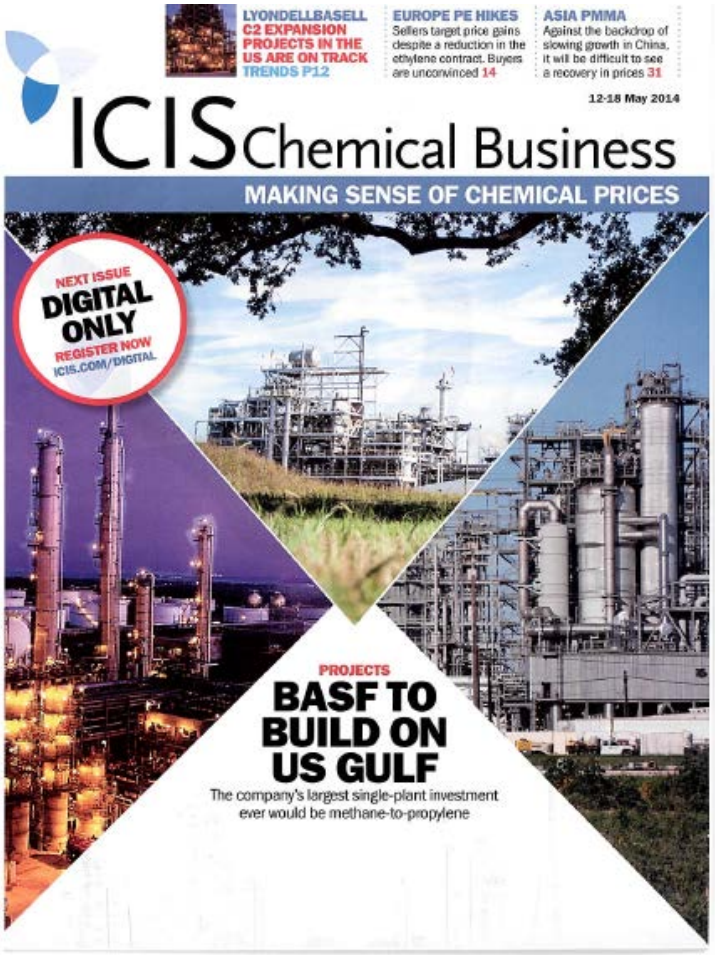
Port Arthur, TX

2013: **Revamp of steam cracker** Port Arthur, TX
(ethane processing and addition of 10th furnace, now > 1 mil t/a ethylene)

Freeport, TX

Announced: **Ammonia JV** with Yara

US Gulf Coast



Methane to Propylene plant,

US gulf coast;

largest BASF single-plant investment to date

Effects on US Economic Growth

Until 2020 cheap natural gas in the US will result in huge growth:

- 46,000 new jobs in the chemical industry
- 72,7 bn USD investments in the chemical industry

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Source: IHS-Global Insights, ACC

BASF and Shale Gas - Summary

BASF views shale gas as an opportunity

We therefore

- support **research on shale** gas also in Europe
- use the fracking application as a new **market for chemicals**
- take advantage of the low energy prices in the **US for new investments**

Wintershall - Selbstverpflichtung

- Freiwillige Prüfungen auf Verträglichkeit für Umwelt und Wasser

- KEIN Hydraulic Fracturing in Trinkwasserschutzgebieten

- Regelmäßige Prüfung der Bohrung auf Unversehrtheit

- Fachgerechte Entsorgung der anfallenden Wässer

- Offene und transparente Kommunikation

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