The general picture of shale gas: why that hype?

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Outline

- Natural Gas and Shale gas: what's the difference?
- How is it produced?
  - Hydraulic Fracturing (Fracking)
- Environmental aspects
- How much do we have?
- Where is it located?
  - Worldwide – Europe – Germany
- The Shale Gas Information Platform „SHIP"

Facts about natural gas

- Fossil fuel
- Natural gas is the cleanest fossil fuel (compared to coal)
- in the medium term, natural gas necessary to perform the energy transition in Germany

conventionally produced natural gas

- overwhelming part of the actual production
- thick deposits in few regions
- decline in the foreseeable future

unconventionally produced natural gas

- Shale gas, Tight Gas, Gas hydrates
- deposits in many regions of the world
- difficult to produce

Shale gas production

- First drilling for Gas Shale in 1821 in the Appalachian Basin (USA)
- Technology of hydraulic fracturing is applied on the grand scale since the 1940ies (also for conventional natural gas)
- since 2000 Shale Gas – Boom in the US
- more than 13.000 new drillings per year
- until 2010 more than 510.000 drillings only in the US (EIA, 2012)

What actually is shale gas?

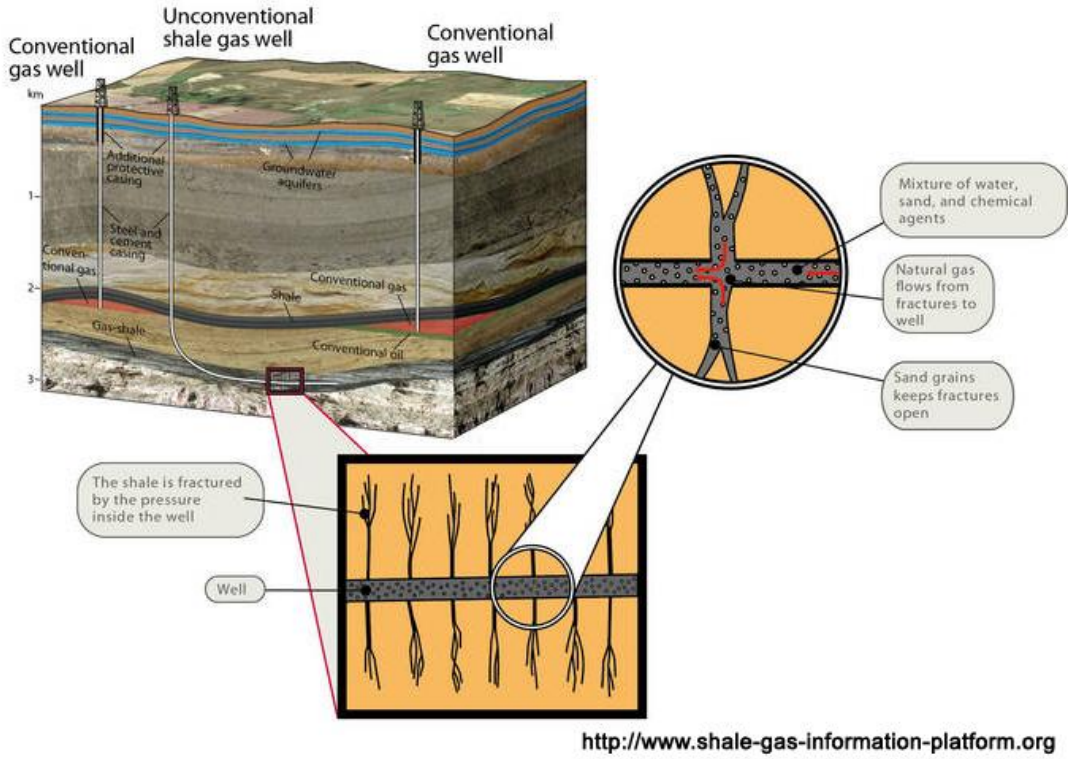
- A natural gas that is trapped in shale
  - Very dense rock
  - tiny pores
- Shale gas is extracted with the help of

→ **Hydraulic Fracturing**

Hydraulic fracturing

fracking of the shale through the injection of a mix of water, sand and chemicals under high pressure

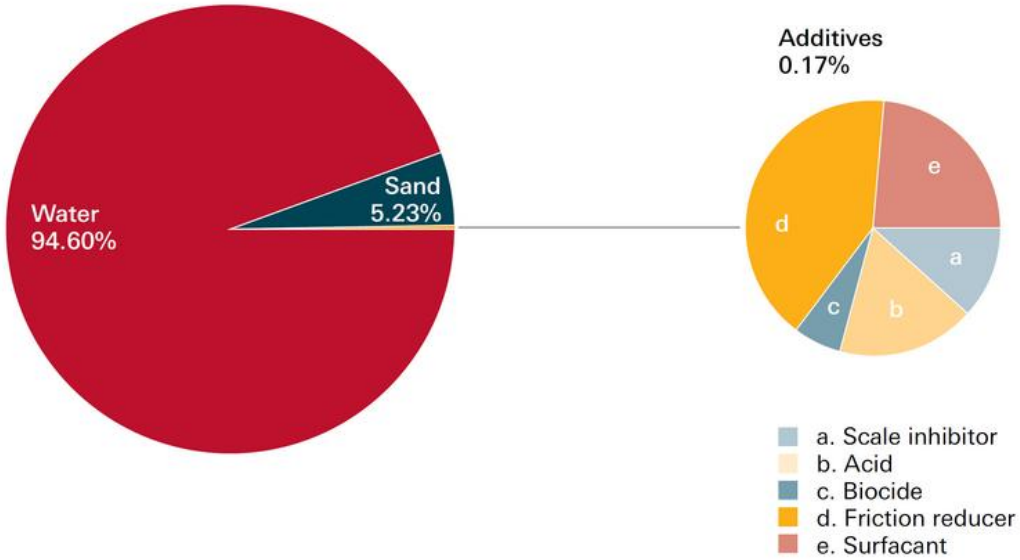
- thus, production of fractures
- through them transport of the shale gas to the earth's surface



Hydraulic Fracturing

Composition of the fluid:

- 99,83% Water and Sand
- 0,17% additives



Current research about frac-fluids without hazardous chemical additives

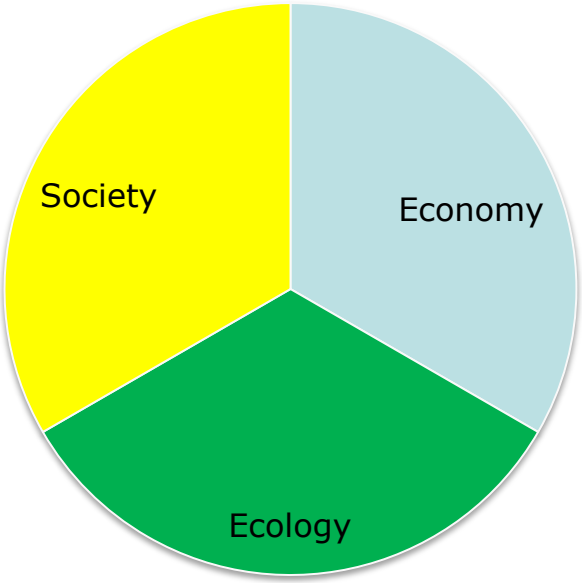
- Only water, starch and bauxite sand
- alternatively only additives from the nutrition technology
- UV-radiation instead of biozides (to control activity of um bacteria)

Environmental aspects

Potential Problems:

- Water demand and –usage incl. chemical additives
- Surface and groundwater contamination
- disposal, e.g. of used water
- Induced seismicity
- Green house gas emissionen during production process
- Contamination of soils
- Land use and traffic volume
- Noise emissions
- **Public Acceptance**

Sustainability is not only about the environment…



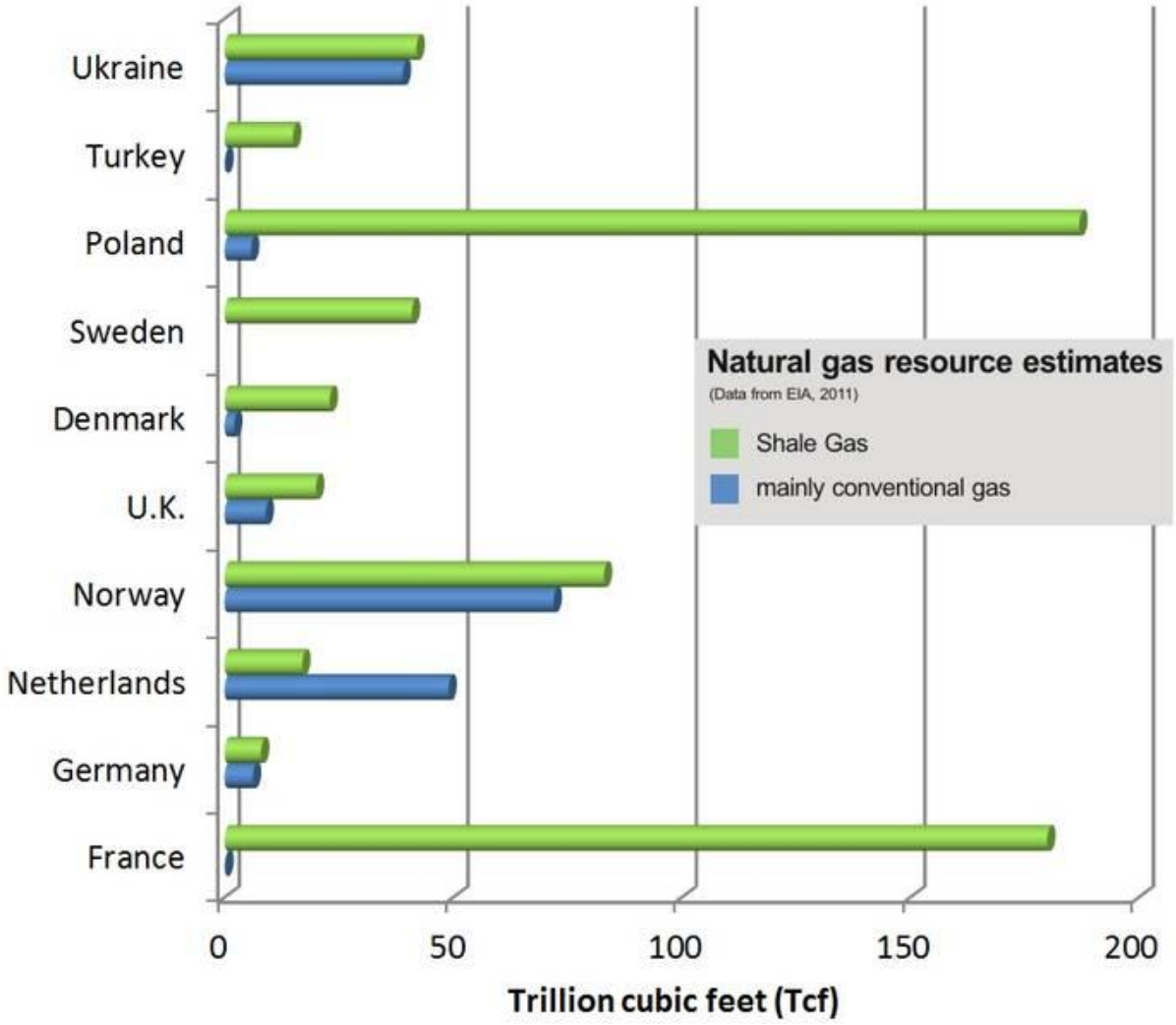
❖ responsible usage of **all** ressources – Economy – Society – Ecology

❖ If we don‘t want shale gas exploration and production in Germany, do we care about env. standards of natural gas production abroad?

❖ Is shale gas already part of the mix of the natural gas that Germany imports?

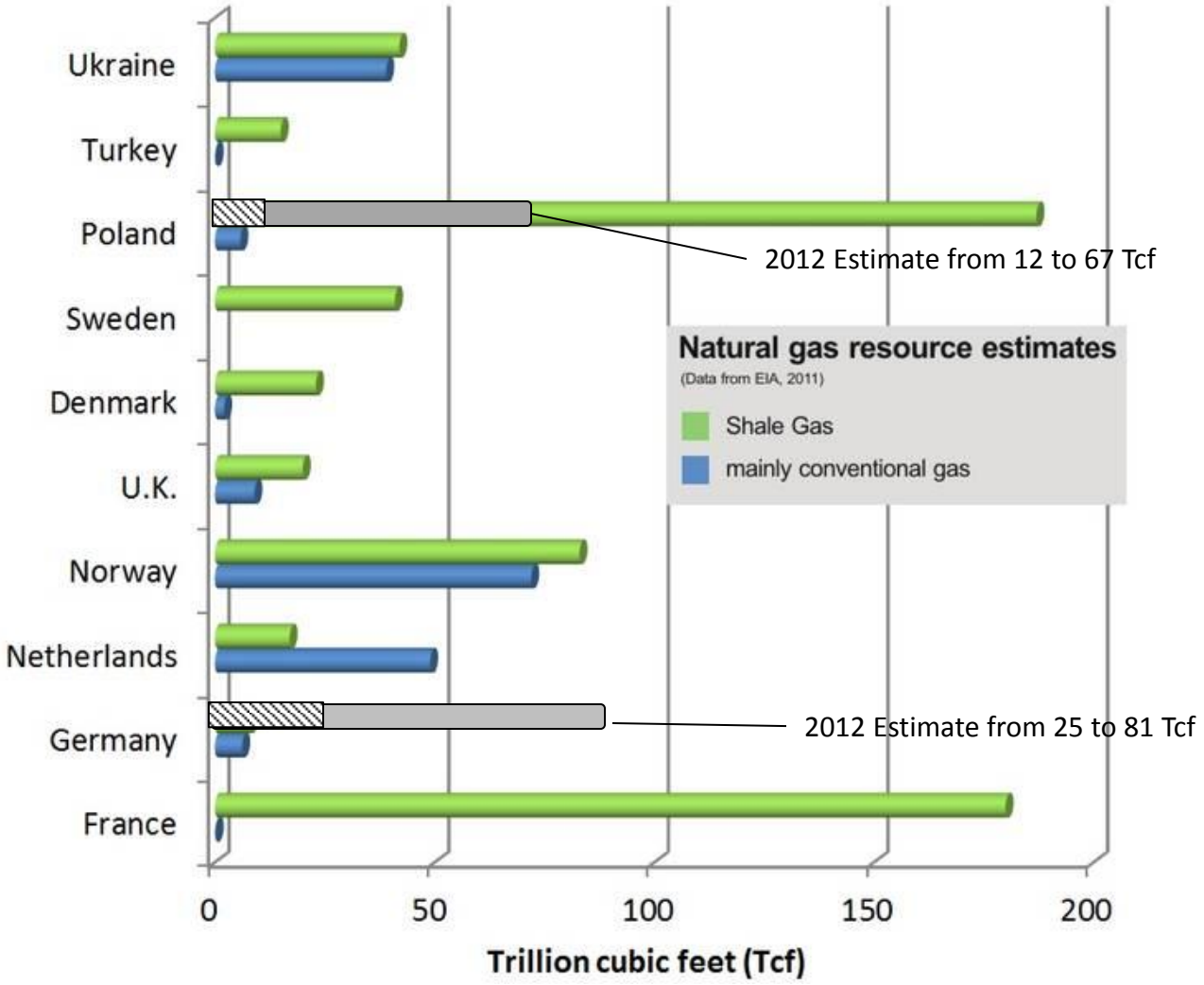
❖ How much natural gas do we want/need for our purposes?

New estimates of shale gas potential for Europe 2011



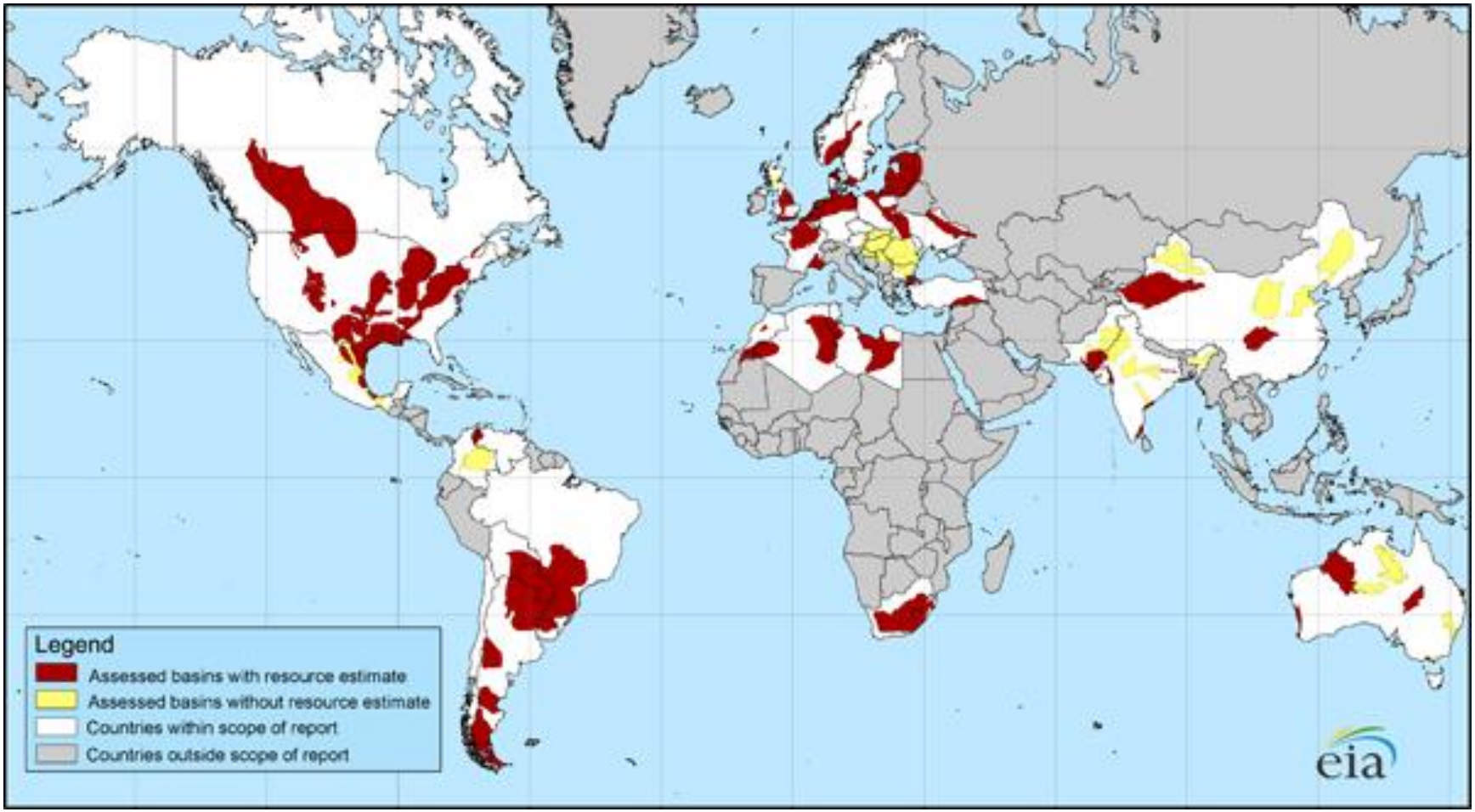
Source: Estimated technically recoverable shale resources for selected basins in some European countries (Data from U.S. EIA "World Shale Gas Resources: An Initial Assessment of 14 Regions Outside the United States", 2011).

New estimates of shale gas potential for Europe 2012



Source: Estimated technically recoverable shale resources for selected basins in some European countries (Data from U.S. EIA "World Shale Gas Resources: An Initial Assessment of 14 Regions Outside the United States", 2011).

Where can shale (gas) be found?



Source: EIA (U.S. Energy Information Administration) 2012

Where are gas-bearing shales located in Europe?

Source: International Energy Agency Golden Rules Report 2012

Shale Gas Information Platform

- Expert network
- Internet platform to provide information and improve knowledge transfer about shale gas
- financed by the Ministery for Education and Research (BMBF) within the framework of the GeoEn-Project
- Information from different points of view
- Focus on Europe

Shale Gas Information Platform

Possibilities to participate:

News Alert per Email to automatically receive news on SHIP

Thank you for your attention!

Literature

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- International Energy Agency (IEA) www.iea.org
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