



# 100% Renewable Energy Supply by 2050: Shale Gas and the Global Carbon Budget

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# Why 100% Renewable Energy?

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## 1. Climate

- at least 80% less Greenhouse Gas globally by 2050

## 2. Conventional oil/gas scarcity

- BAU: we need “4 times Saudi Arabia and 4 times Russia for 2030”

## 3. Threats of unconventional fuels

- CTL, GTL, deep water oil, shale gas, tar sands - more impacts than just carbon

## 4. Nuclear development

- What to do with 100,000 tonnes toxic waste for next 10,000 years?

## 5. Equity

- 1.4/2.7 billion people lack access to electricity/safe cooking energy

## 6. Costs

- No-regret technologies, easy to implement, hardly any fuel, and no adaptation costs

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CTL: Coal To Liquid GTL: Gas To Liquid
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# The role of natural gas – the ‘conventional wisdom’

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- *Low carbon fuel – good for climate*
- *Clean fuel – good for health*
- *Replacing coal and oil wherever possible*
- *Flexible fuel – Renewable power back-up*
- *Bridge towards full renewable supply*



# Shale Gas and environmental implications

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- *Water pollution*
- *Water use*
- *Chemical use*
- *Land clearing*
- *Land use*
- *GHG emissions over lifecycle*
- ***Impacts on the global carbon budget***

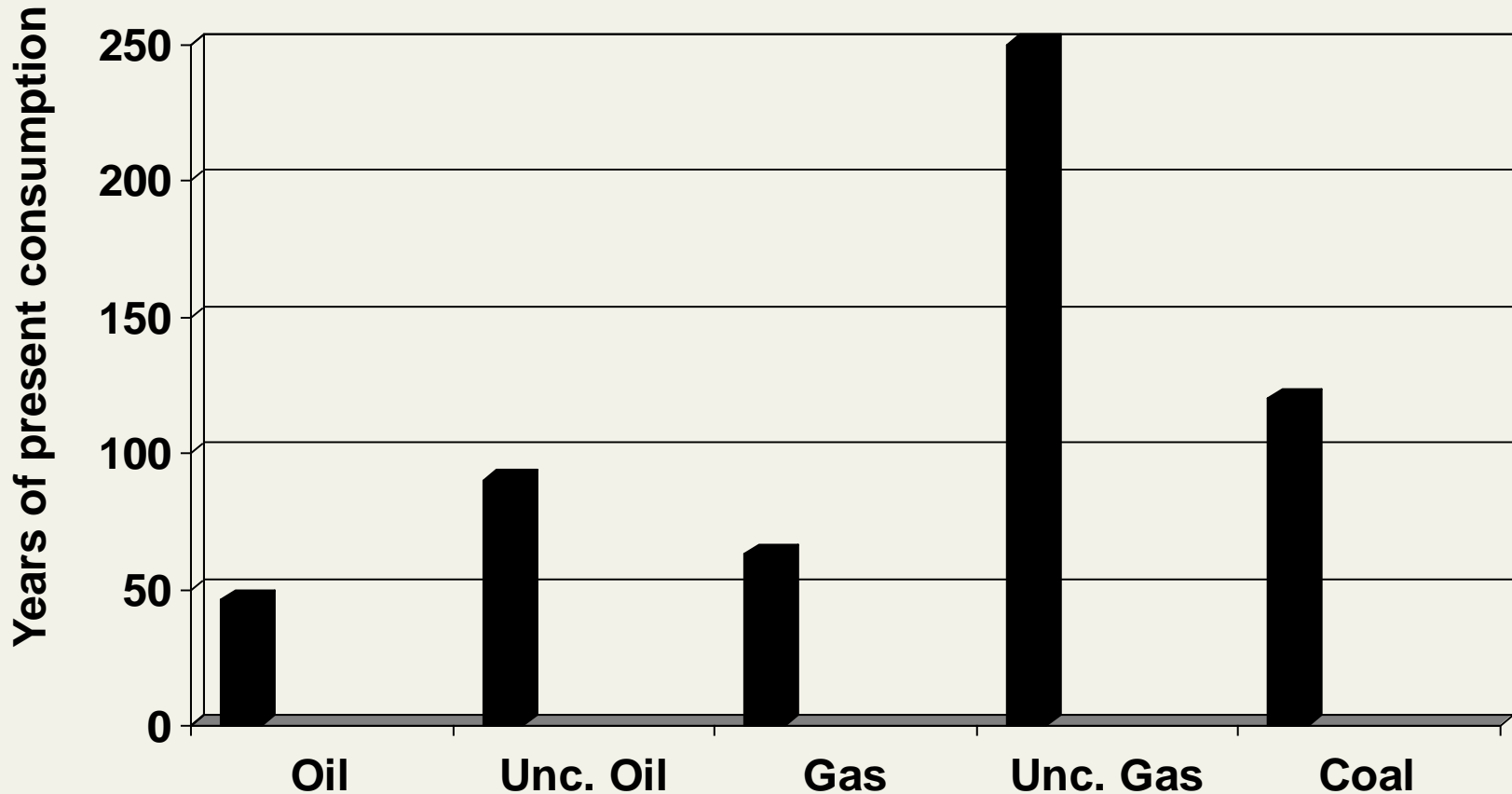


## IEA assessment on Shale Gas and Climate

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- ***IEA – The Golden Age of Gas Scenario:*** An increased share of natural gas in the global energy mix will put us on a carbon emissions trajectory reaching 35 Gt in 2035, consistent with stabilising greenhouse gases at around 650 ppm, resulting in a likely global temperature rise of over 3.5°C, well above the widely accepted 2°C target.
- This is because lower prices for natural gas will lead to an increased demand for gas. In this scenario, **gas will not only displace coal but also nuclear power and suppress renewable energies.**

# Global fossil conventional and unconventional oil & gas reserves

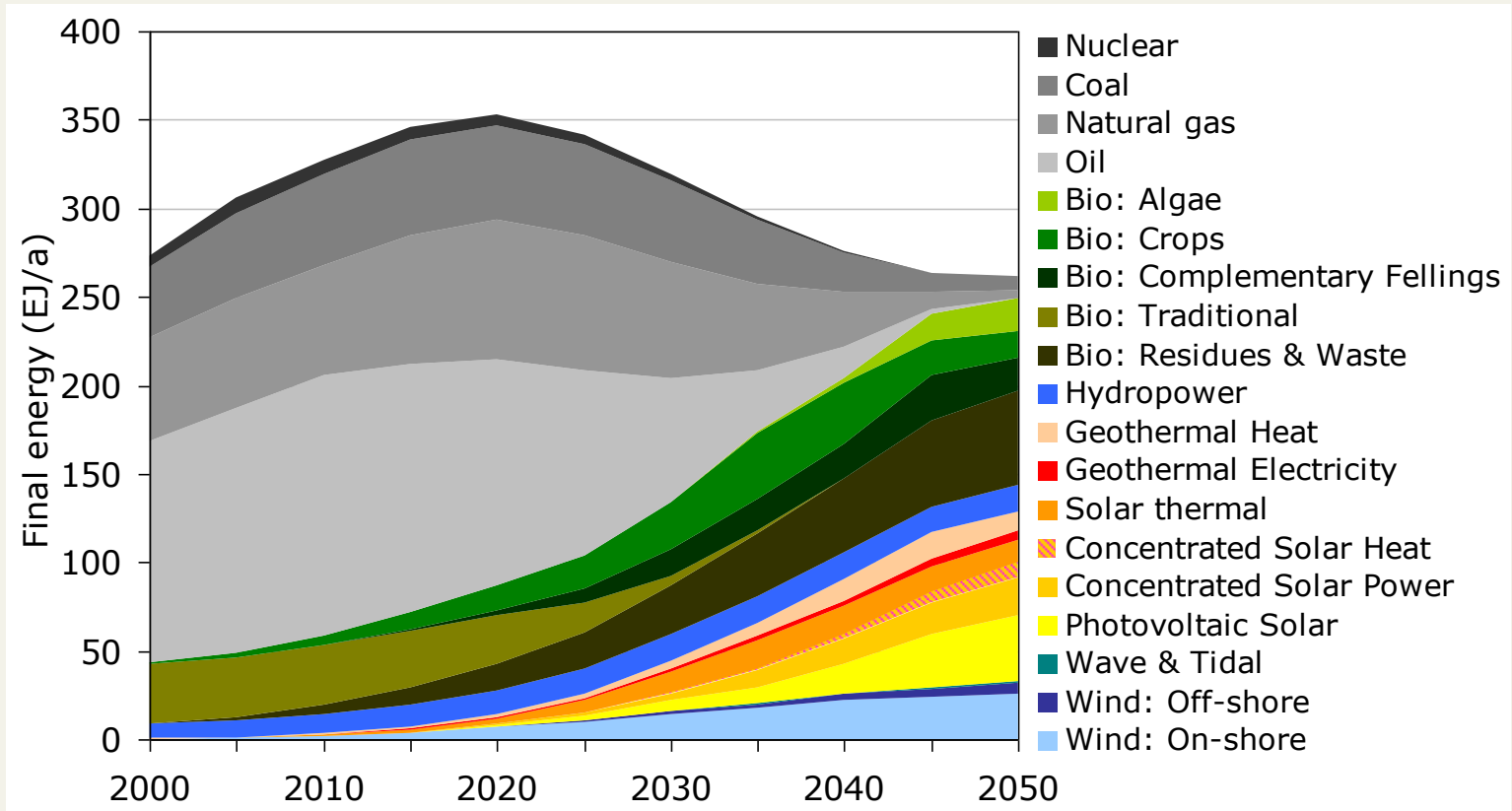


Sources: BP Stat. Review 2010;  
IEA WEO 2009, 2010, 2011;  
US Geolog. Survey 2010

April 2011



# The Energy Report



Almost 100% renewable energy worldwide by 2050 is possible.

Source: *Ecofys/ WWF*



## Summary

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- ***There is already too much carbon out there***
- ***Shale gas will increase the carbon reserve base***
- ***Shale gas may contribute to substantially exceeding the 2-degree threshold***
- ***Price decreases may impact negatively on renewable energies***
- ***WWF campaigns for 100% renewables by 2050 worldwide ([wwf.panda.org](http://wwf.panda.org))***