

# The German Energiewende from the Nordic perspective: Conflicts and potentials for cross-border co- operation

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**Berlin, 4. November 2014**

# Norway: Europe's Green Battery

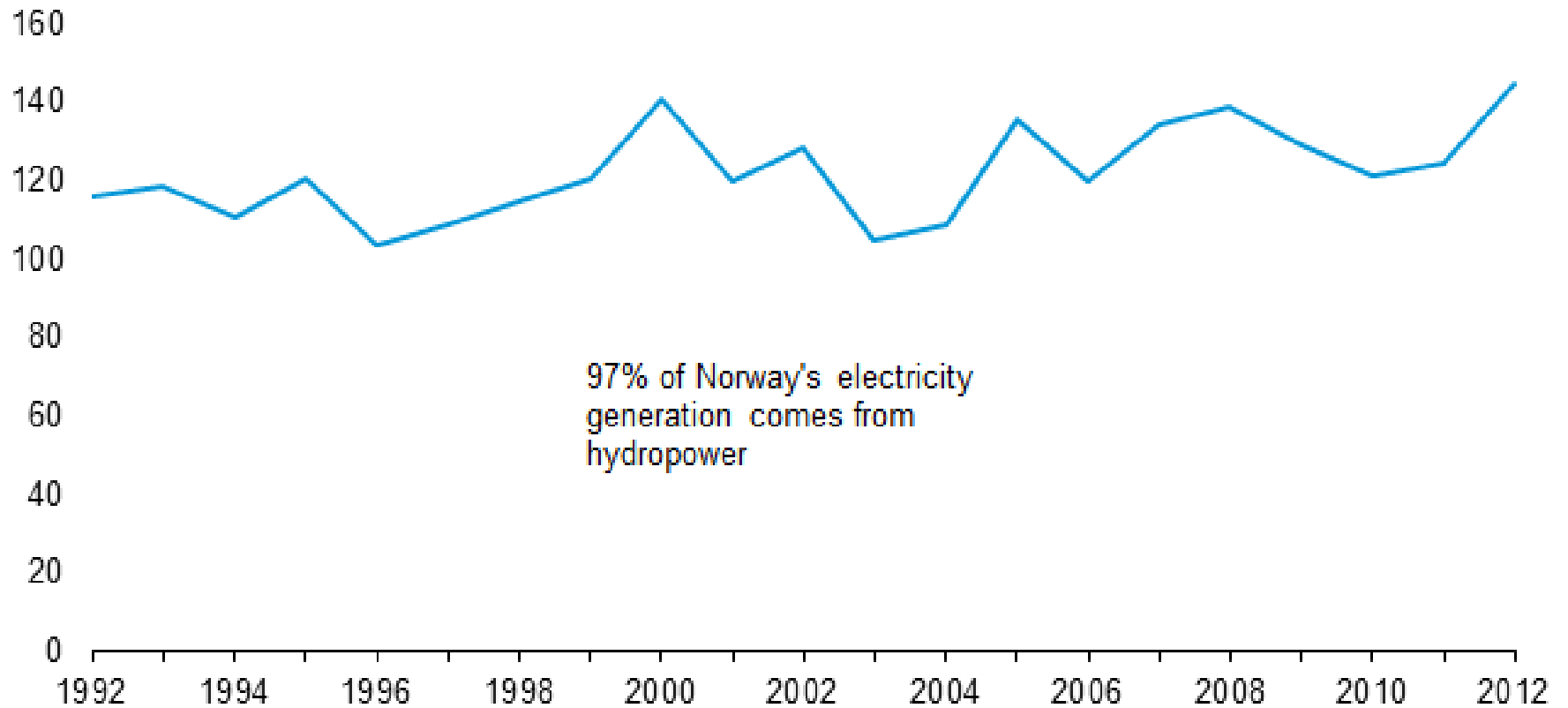



# Norway's energy resources

- A major energy nation in Europe based on a unique set of resources:
  - Hydropower
  - Petroleum
  - New renewable energy sources (wind power and biomass)
- One per cent of Europe's population, but:
  - 20 % of the hydropower resources
  - 40 % of the natural gas resources
  - 60 % of the oil resources

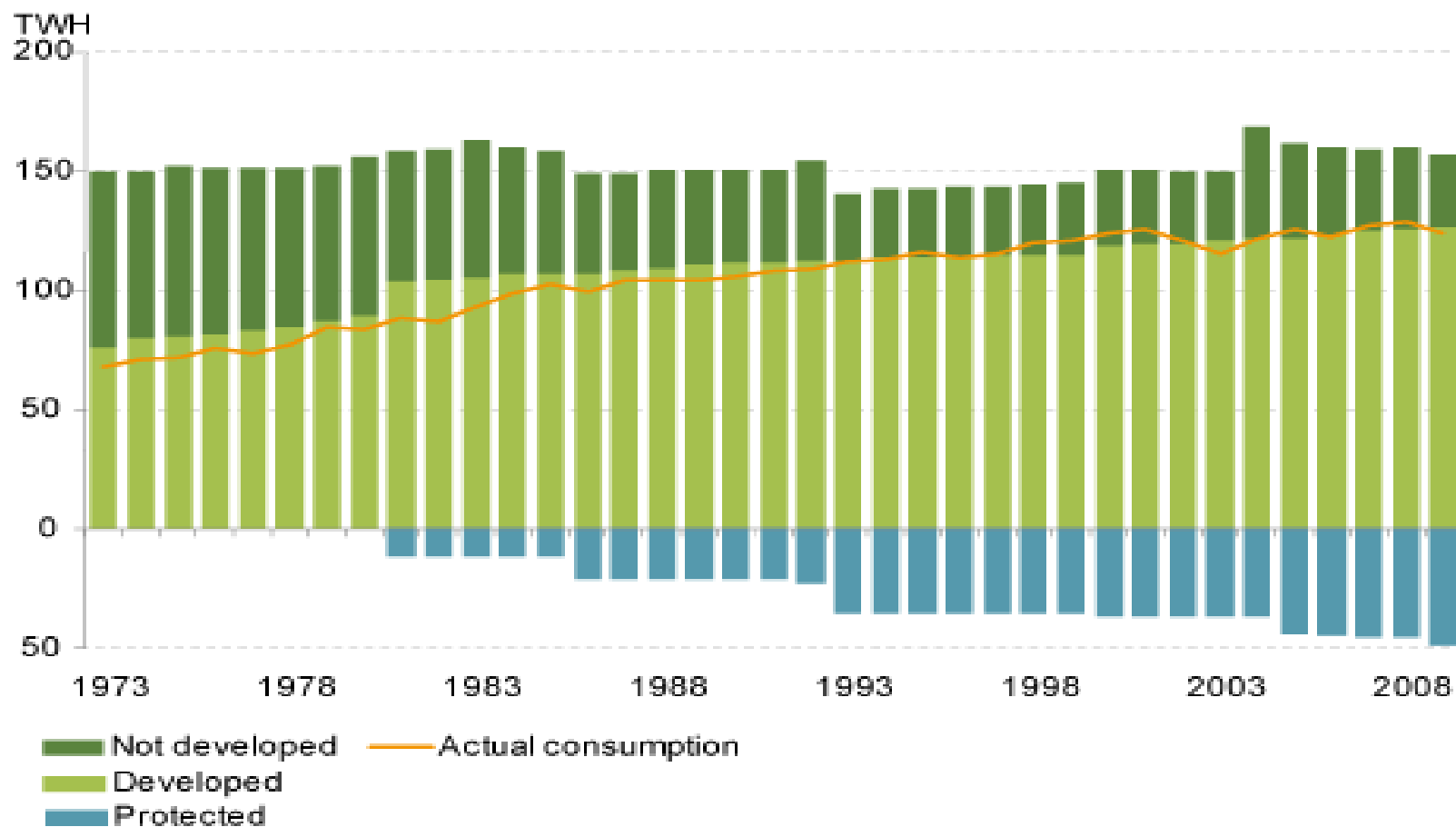
# Norway electricity generation, 1992-2012

billion kilowatthours



 Source: U.S. Energy Information Administration

→ **Hydropower resources in Norway, 1973-2009**



SOURCE: Norwegian Water Resources and Energy Directorate, 2010 / [www.environment.no](http://www.environment.no)

# Public acceptance issues

- Grid expansion (Gullberg 2013)
- Pumped storage (Ohlhorst et al. 2012)
- Electricity prices (Korpås 2014)
- Sea cables/ Interconnectors (Gullberg et al. 2014)

# Interconnectors approved October 2014



# The other type of balancing power

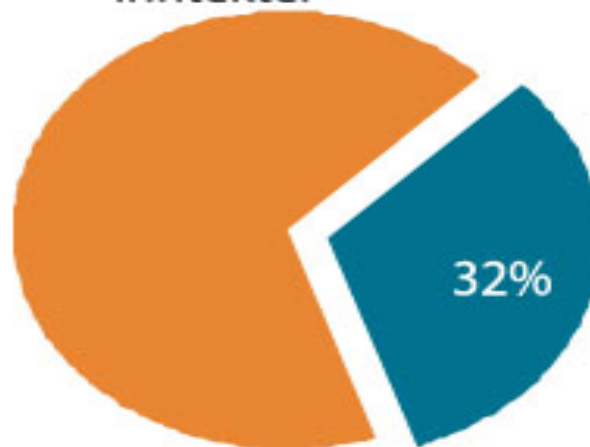
- Norway's economy is based on petroleum extraction and exports
- Powerful embedded interests that shape policy making in the energy sector
- Natural gas can be an important source of balancing power for Europe in the medium term (until 2030) if it replaces coal



Petroleumssektorens andel av BNP



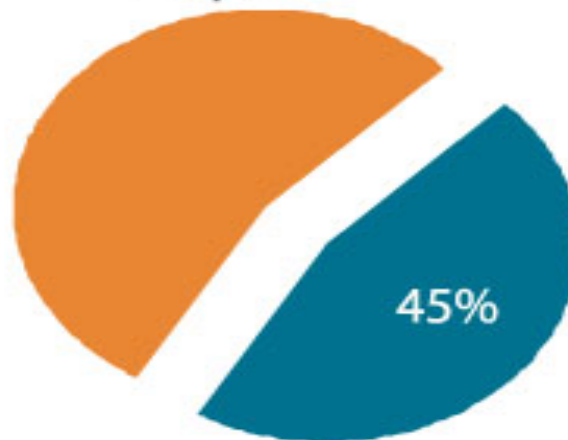
Petroleumssektorens andel av statens inntekter



Petroleumssektorens andel av samlede investeringer



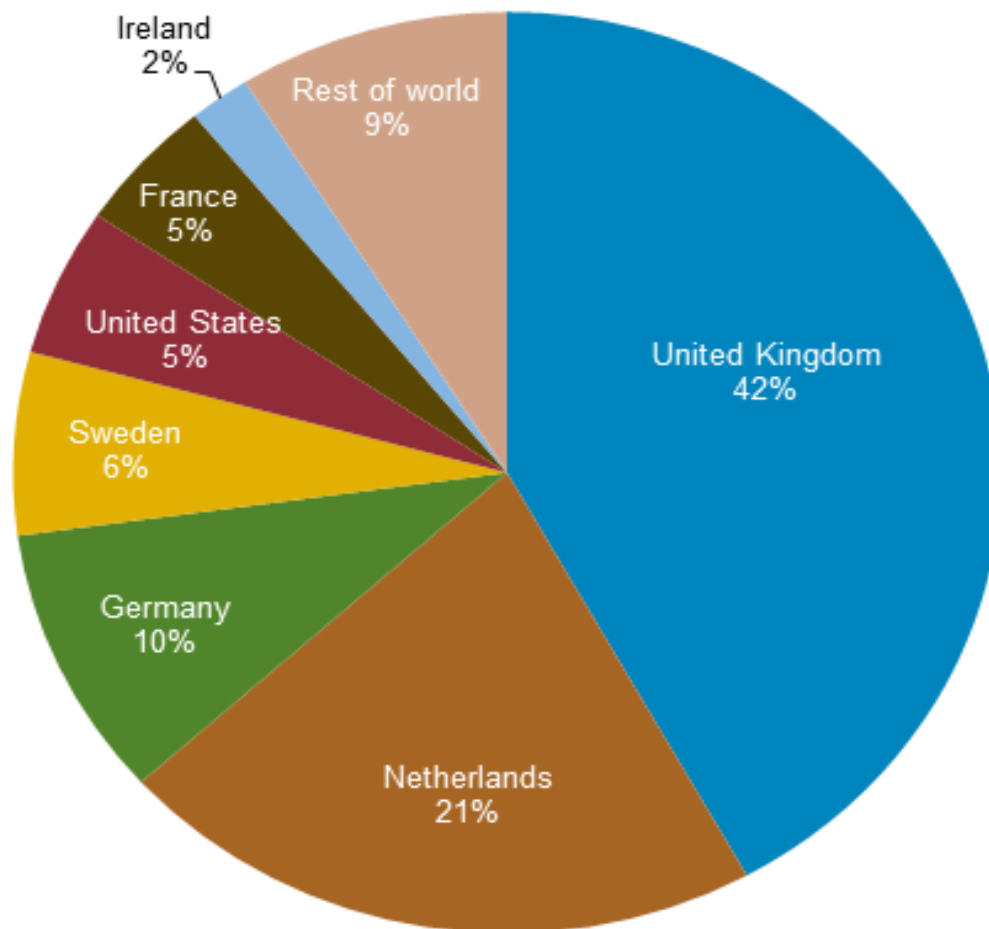
Petroleumssektorens andel av samlet eksport



*- The petroleum industry is Norway's most important industry sector, providing the largest share of national income and jobs for around 250 000 people. It is of utmost importance that we deliver good politics in this area.*

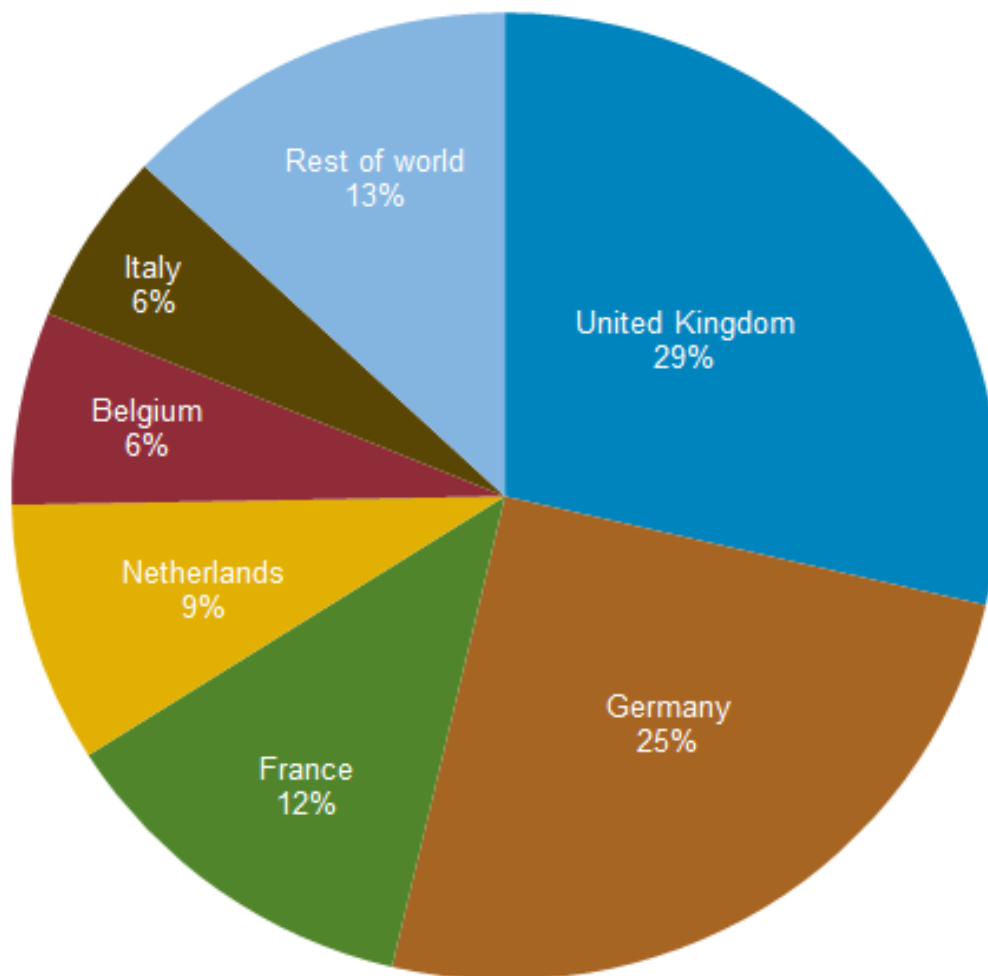
Tord Lien, Minister of Oil and Energy, 2014

## Norway crude oil exports by destination, 2013



Source: Statistics Norway

## Norway natural gas exports by destination, 2013



Source: Statistics Norway

Note: Preliminary 2013 export data includes both LNG exports and exports by pipeline

# Two types of balancing power from Norway

- Natural gas will continue to be part of the picture in coming decades – price issues
- Hydro power will likely become more important - public acceptance issues

# Thank you for your attention!

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