

# European Economic Area Financial Mechanism 2009-2014 GR03 Programme «Renewable Energy»

## **Energy profile: Norway**

# Section

## Facts about Norway

# General Information

- ✚ Total land area: 384 802 km<sup>2</sup>
- ✚ Population: 5,137,679
- ✚ Capital: Oslo
- ✚ Main resources/industries:
  - Petroleum
  - Natural gas
  - Hydropower
  - Minerals
  - Lumber
  - Seafood
  - Fresh water
  - Food processing
  - Shipbuilding
  - Pulp & paper products



# Knowledge shots (1)

- Classified as the most democratic country by the Democracy Index from 2010 to 2012
- 2<sup>nd</sup> largest exporter of seafood in the world
- 2<sup>nd</sup> largest gas exporter in the world
- 4<sup>th</sup> highest per capita income in the world on World Bank & IMF lists
- 5<sup>th</sup> largest merchant fleet in the world
- 6<sup>th</sup> biggest hydropower producer in the world
- 7<sup>th</sup> largest oil exporter

# Knowledge shots (2)

- ✚ 24% of EU natural gas imports come from Norway
- ✚ 95% of Norwegian electricity comes from RES (hydro & wind power)
- ✚ Allocation of 1% of its Gross National Income to international development cooperation (2011)
- ✚ Contribution of € 230 million to the EU programme budget (2010)

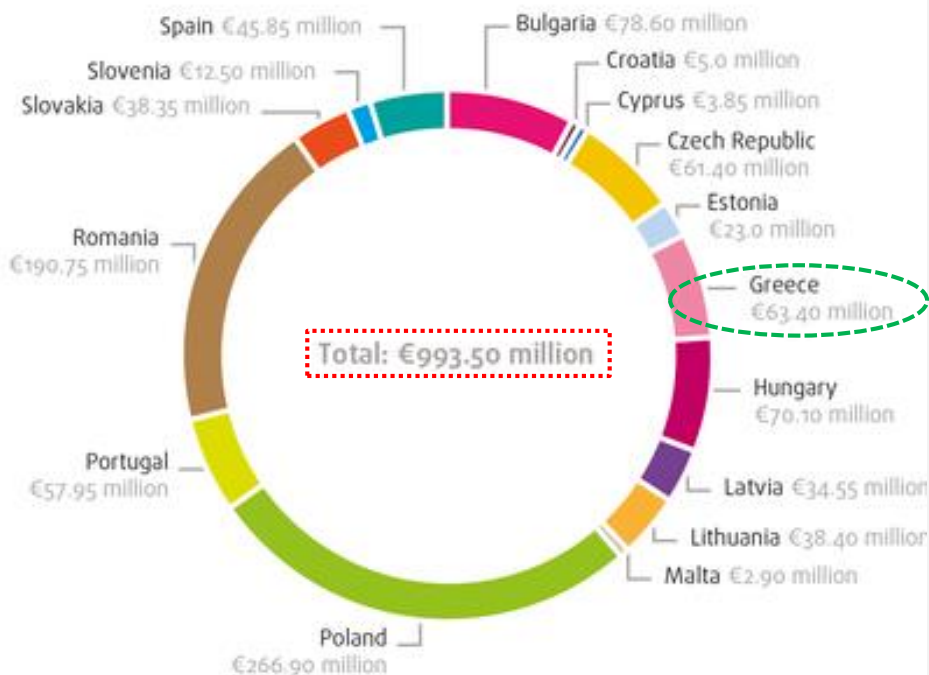
# The role of Norway through EEA

For the period 2009-2014, Norway is providing almost € 1.76 billion to efforts to reduce social and economic disparities within the EEA

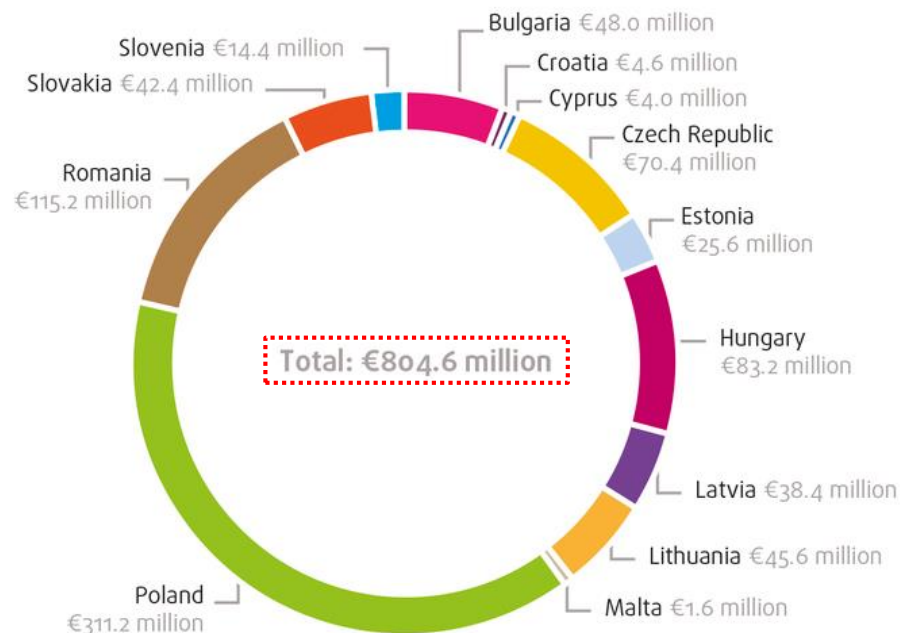
€ 952 million for EAA Grants (95.8%)

€ 804 million For Norway Grants

EEA GRANTS 2009-2014



NORWAY GRANTS 2009-2014



## Section

# Energy profile of Norway

# Key points of Energy Strategy

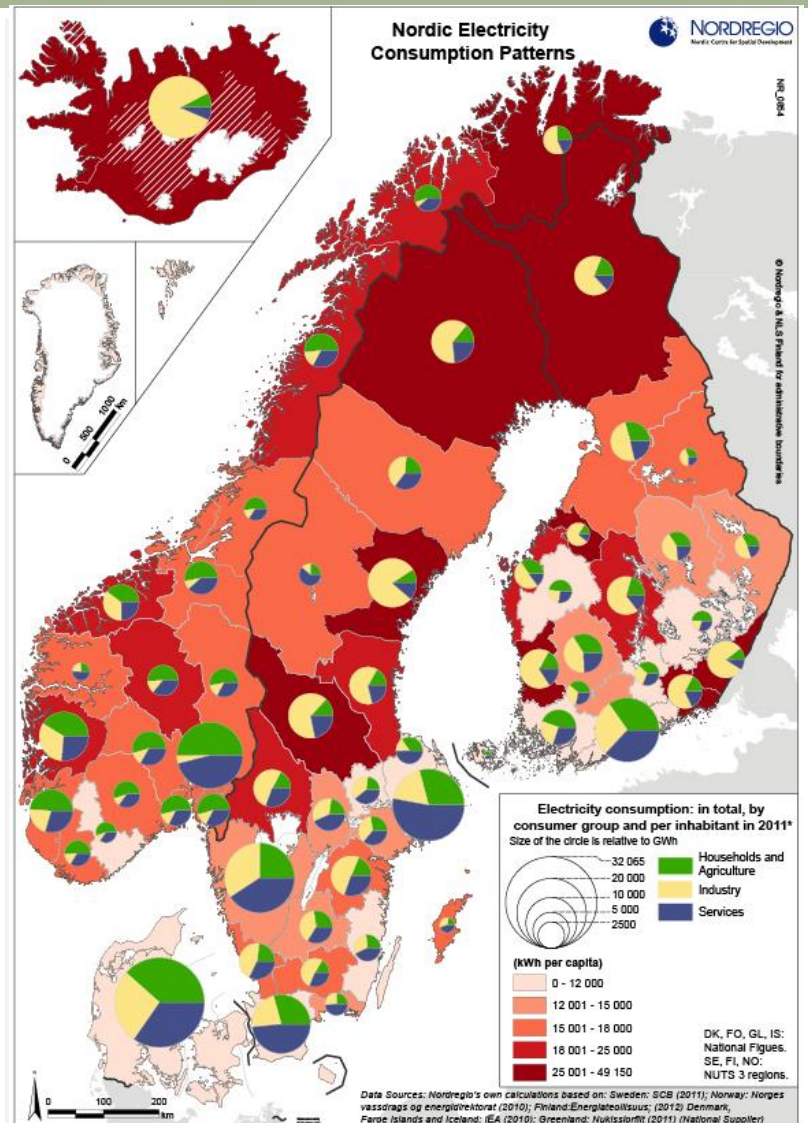
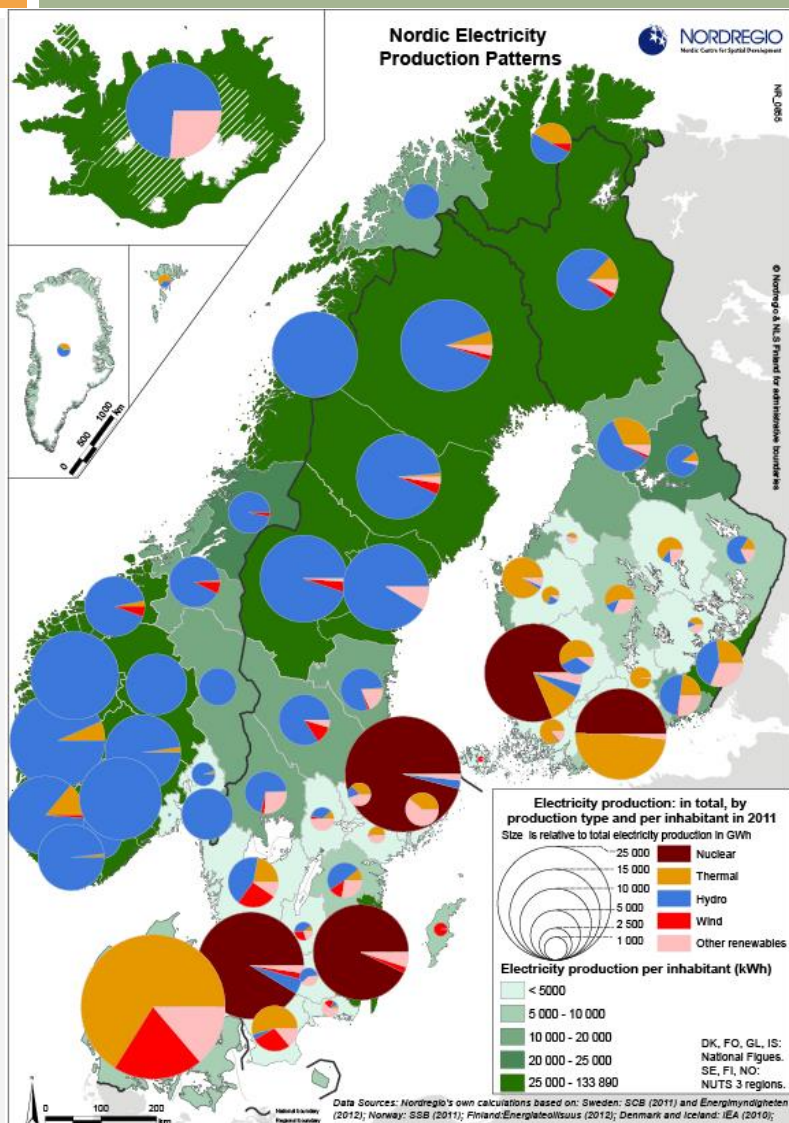
- ✚ Government' Goal: A climate-friendly energy system taking into consideration nature diversity, local communities & other public interests
- ✚ Norwegian target for RES: 67.5% in 2020
- ✚ Production of 148 TWh of electricity (2012)
- ✚ RES amounted 145 TWh, aiming to increase the renewable power production by an additional 13.2 TWh by 2020
- ✚ The 2020 RES target in transport sector: 10%
- ✚ National target to increase bioenergy use by 14 TWh by 2020



# Energy Status & Statistics (1)

- ✚ Electricity production
  - very high share of renewable energy
  - based on hydropower (143 TWh)
  - nearly all electric energy derives from hydroelectric power plants (96.7%)
- ✚ Norway has large oil and gas deposits representing
  - 45% of its total export
  - 20% of its GDP
- ✚ For the period 2006-2011:
  - new facilities with production capacity of about 5.3 TWh became operational
  - final permits granted to facilities with annual production capacity about 8 TWh

# Energy Status & Statistics (2)

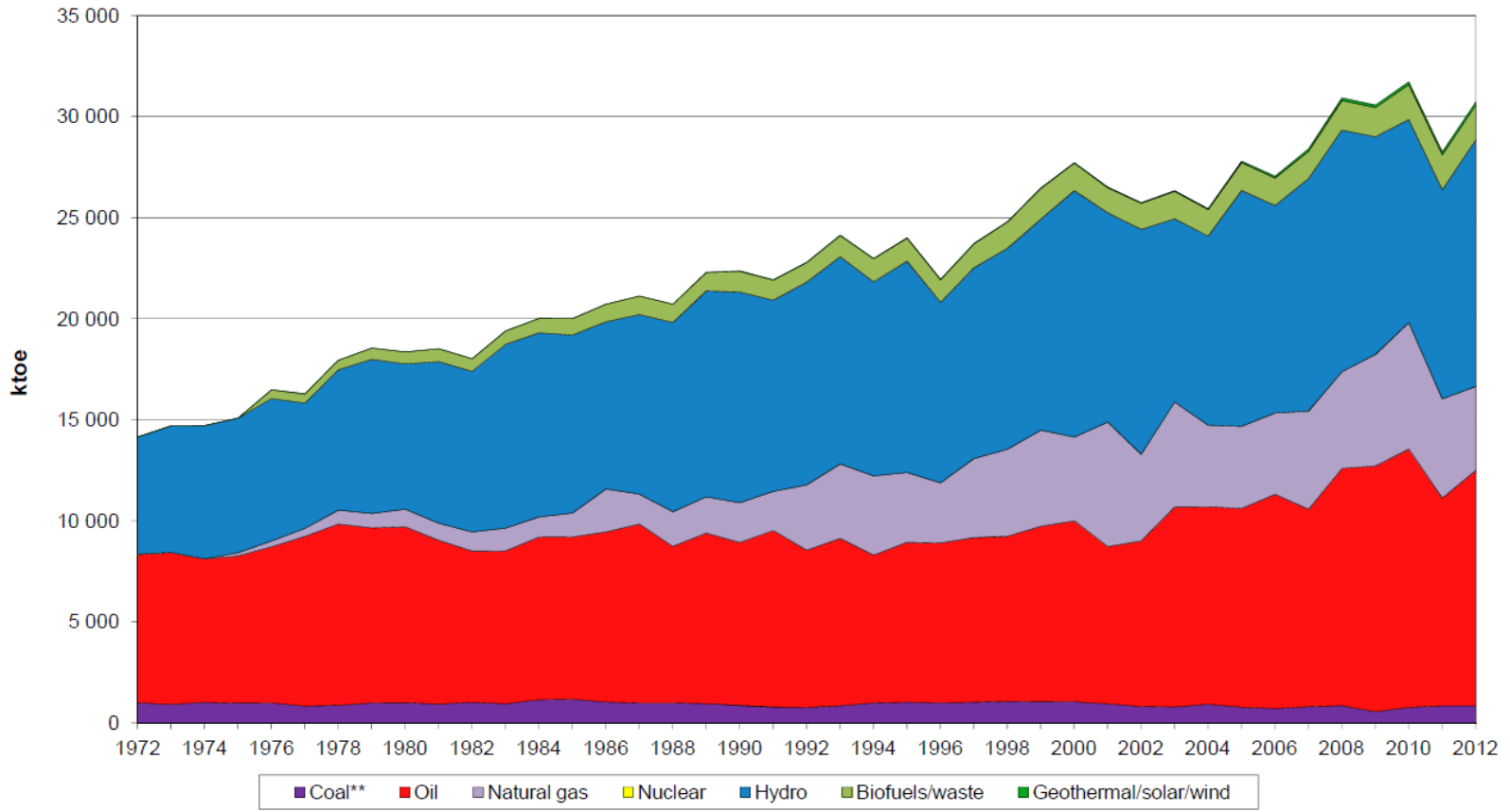


# Energy Status & Statistics (3)

IEA Energy Statistics

Statistics on the web: <http://www.iea.org/statistics/>

Total primary energy supply\*  
*Norway*



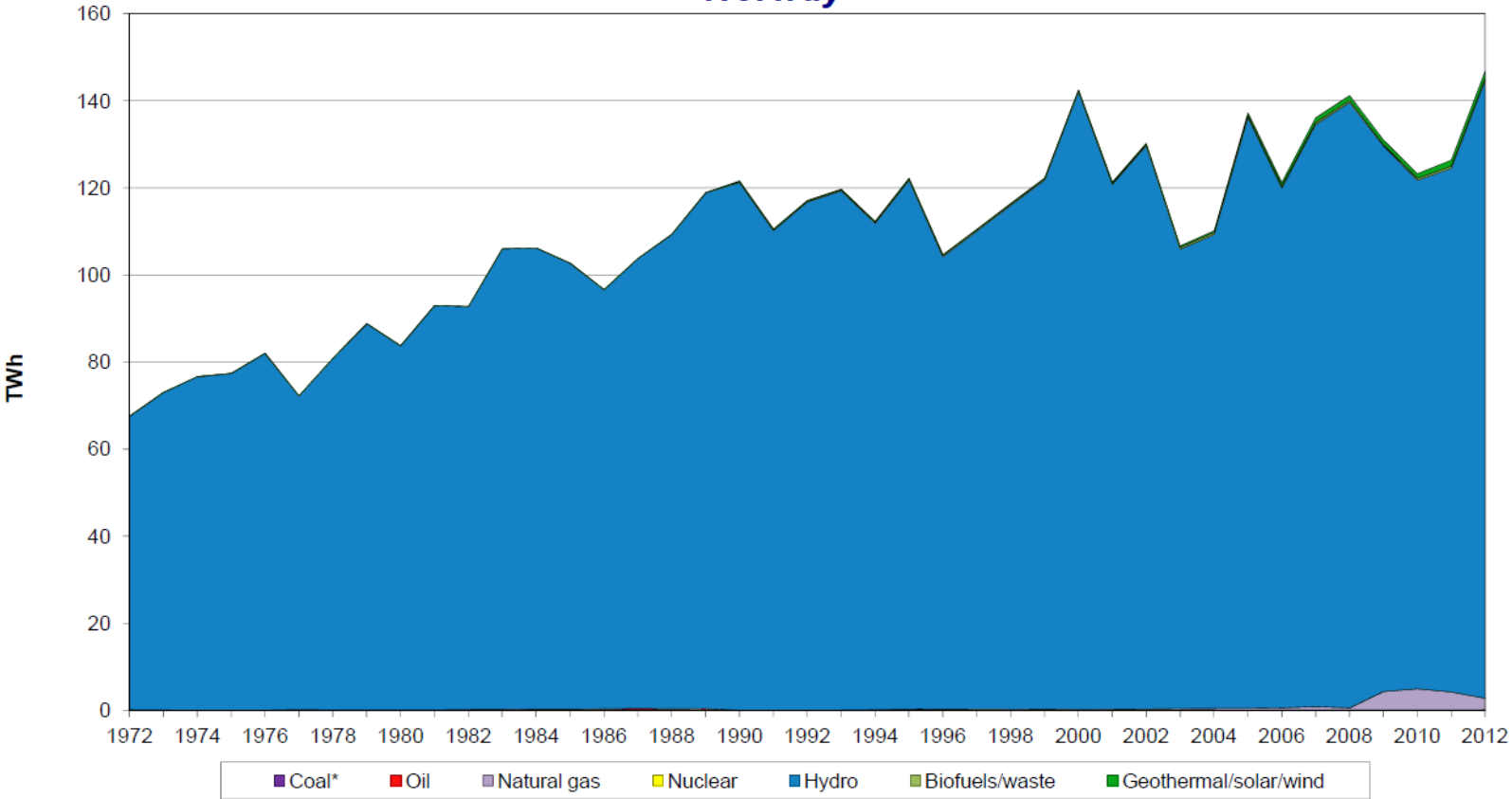
# Energy Status & Statistics (4)

IEA Energy Statistics

Statistics on the web: <http://www.iea.org/statistics/>

## Electricity generation by fuel

### Norway

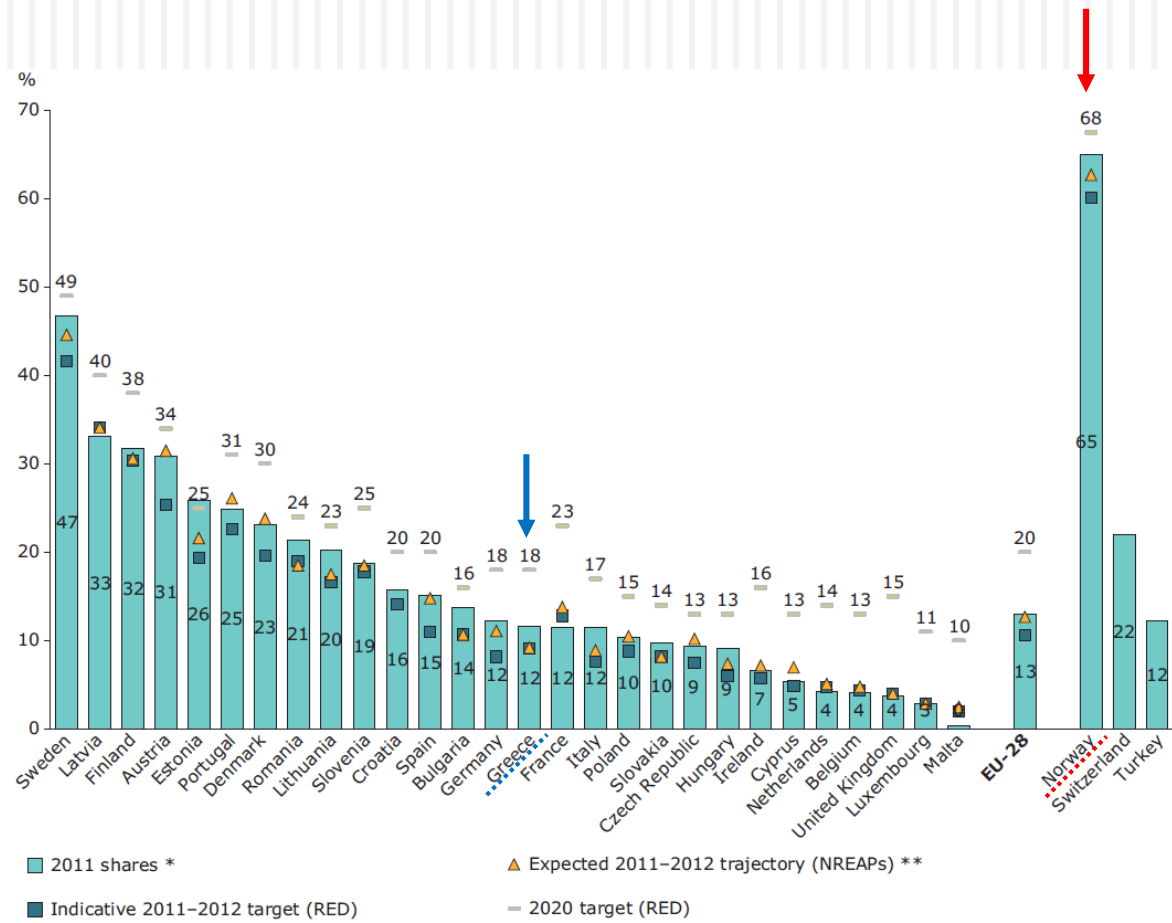


# Energy Status & Statistics (5)

- ✚ Use of RES also increasing in the transport sector → from 1.3 per cent in 2005 to 4.0 per cent in 2010
- ✚ Norway has one of the world's largest fleets of electric cars → 2.5 % of new cars (Q1 2012)
- ✚ Carbon Capture and Storage (CCS) investments (~€430 million, 2011)
- ✚ Increased production of renewable energy depends on a well-functioning electricity grid
  - In 2010, Statnett's (Norwegian System Operator) investments totalled nearly €233 million
- ✚ The Norwegian renewable energy sector comprises (2010):
  - ≈2 000 companies
  - 50 000 employees
  - a revenue of 200 billion NOK (24.6 billion EUR)

# Overview of renewable energy utilization in EEA countries

Share of renewable energy in gross final energy consumption in EEA countries



**Note:** \* Values for Norway and Switzerland are for 2010 shares  
 \*\* Value for EU-28 assumed to be identical to that of the EU-27

## Section

# RES market institutions & players

# Flow chart of supporting & funding low-carbon energy RD&D in Norway

✚ Energy issues are addressed by the Ministry of Petroleum & Energy and a number of underlying agencies

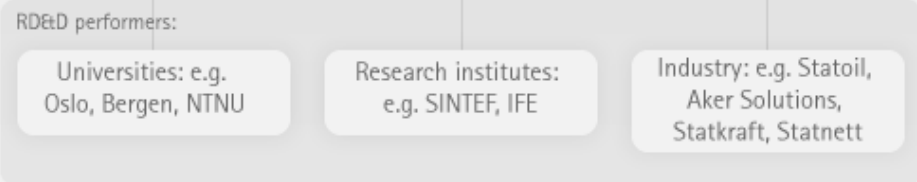
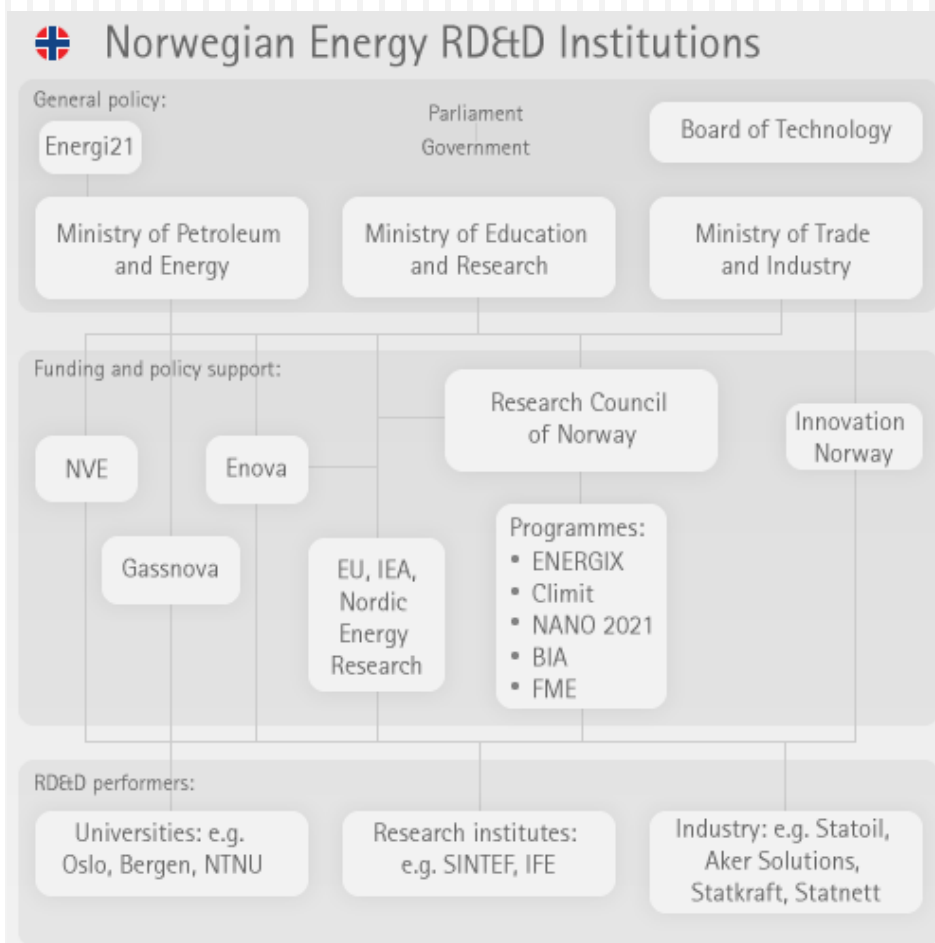
## ■ Energi 21 strategy

promotes & co-ordinates research, development, demonstration (RD&D) & commercialization of new technologies for the growth of sustainable economic activity & supply-side security in the energy sector

## ■ Programmes

ENERGIX, Climit etc.

■ Public research funds for low-carbon energy are mainly channelled through the Research Council of Norway (RCN)



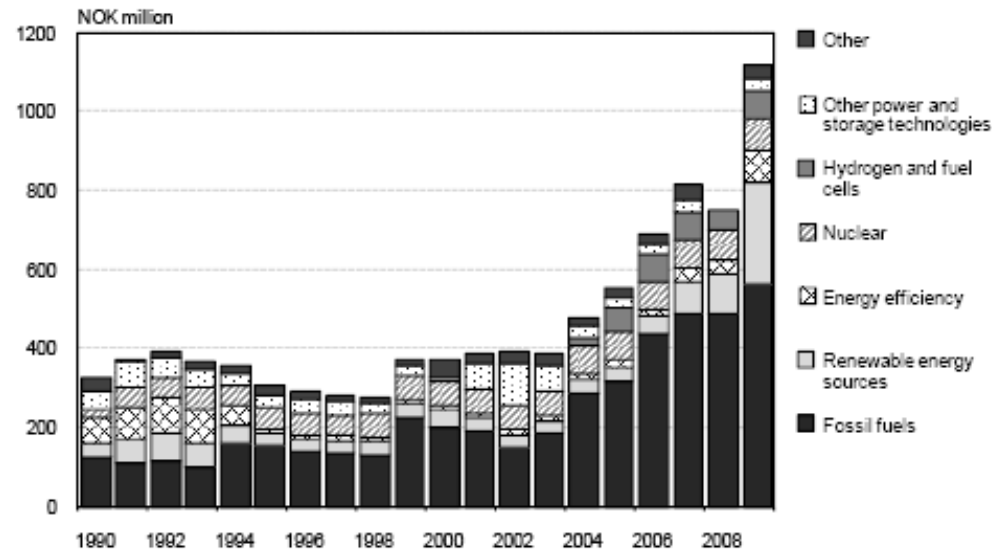


# Energi21 strategy

- ✚ This specific energy strategy has 6 priority areas:
  - Renewable energy production: hydropower, wind power and solar energy
  - Energy systems (electricity):
    - transmission grid, offshore/onshore
    - distribution grid
    - policy structures, framework conditions, and power market
  - Raising energy efficiency in industry
  - Renewable thermal energy:
    - biomass heating
    - geothermal energy
    - distributed heating and cooling solutions
  - Carbon capture and storage (CLIMIT Programme)
  - Frameworks & social analysis


# Funding RD&D on Energy

- ⊕ Since 2003, public spending on RD&D has dramatically increased
- ⊕ Almost being tripled in 2009, reaching €126 million
- ⊕ 50% goes for fossil fuels sector
- ⊕ Great funding increase for CCS, RES & Energy efficiency
  - 15% of RD&D funds for CCS
  - 23% of RD&D funds for RES
  - 7% of RD&D funds for EE



# Key Norwegian RES Market Actors

**Energy Strategy & Policy**



NORWEGIAN MINISTRY OF PETROLEUM AND ENERGY

Universities

**Funding & Policy Support**



norden  
Nordic Energy Research



The Research Council of Norway



INNOVATION NORWAY



NVE



enova



GASSNOVA



transnova  
- for bærekraftig mobilitet

**Performers**



**SINTEF** **IFE** Institute for Energy Technology



Statkraft



**Statnett**



Statoil



**Aker**Solutions™



**NTNU**

# Norwegian RE clusters



Networking organization for promoting cooperation between Norwegian & foreign players, Norwegian authorities, companies & participants with an international experience.



A network of institutions in the greater Oslo region for innovation.



A non-profit industry organization representing 270 companies in producing, distributing & trading electricity. Portfolio of 130 TWh (99%), 2.5 million customers (91%), 15,000 employees, gross turnover €10 billion.



Cluster of energy & industrial businesses, research communities & local government. Contributes to profitability, developing wind power & reduced energy cost for wind power production.



Norwegian wind energy association, actively involved in promoting onshore power as well as marine renewables in domestic market.



An industry cluster focusing on offshore wind.



Develops smart & sustainable energy innovation & business development. Cooperating around energy & ICT activities.



An industry cluster of Norwegian companies cooperating & exploring business opportunities within the electric vehicle market. Developing, testing & commercializing products & services to enhance electric vehicles.

# New Trends in Energy & RES technologies

- ⊕ Offshore wind energy
- ⊕ New batteries
- ⊕ Solar cells
- ⊕ Micro-sized power plants
- ⊕ Fuels & fertilizer from CO<sub>2</sub>

**Thank you for your attention...**