Renewables in the Changing Energy Situation

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Recent Trends in Renewables

- **Strong growth continuing in 2011 despite uncertain economy**

- **Markets rapidly moving to different regions**

- **PV markets still concentrated in too few countries**
Current context – Full of uncertainty

- Uncertain economic recovery
- Geo-political turmoil in North-Africa / Iran and impacts on oil prices
- Unconventional gas in the US – and elsewhere?
- Post-Fukushima concerns on nuclear
Sluggish Electricity Demand

OECD power generation, 2007=1.00

Conventional generation is 370 Twh below 2007

Total electricity demand in 2011 still below 2007 levels
Impacts on RE

- Very different impacts depending on robustness of RE policy support framework

- In some countries very low energy demand → no additional capacity of any kind needed

- Cost of capital and access to credit more difficult → higher costs of up-front capital intensive renewables
Oil price trends and burden on GDP

World: Oil Burden & Price

Contributing to the next shock?

1st oil shock
2nd oil shock
3rd oil shock
Post-recession recoveries

Source: IEA 2012
Impacts of high oil prices

■ General:
  ● Strong driver for energy security and diversification
  ● Make gas more expensive via indexation
  ● BUT make unconventional production more profitable (oil shale, oil sands, GTL)

■ Electricity
  ● Around 1000 TWh produced worldwide → RES-E attractive

■ Transport
  ● In principle make biofuels more competitive
    (BUT also production of some biofuels more expensive via high oil and fertilizers price)
  ● Render electro mobility more attractive

■ Heat
  ● Make RES-H applications more competitive
    (23% of fuels for heat in OECD oil)
Continuing deglobalisation of gas markets

Source: IEA 2012
Unconventional gas in the world
The 2010 picture

- North America ~ 420 bcm
- Latin America Tight ~ 2 bcm
- Europe CBM < 1 bcm
- FSU Tight ~ 20 bcm CBM < 1 bcm
- Middle East & Africa Tight: NA
- Asia Tight ~ 30 bcm CBM ~ 6 bcm
- Australia CBM ~ 5 bcm

- So far, it is essentially a North American gas story... from the production point of view
- For how long?
US: gas beats coal in conventional power generation, while renewables nicely grow

Cumulative change in power generation 2005-2011, Gwh

- Coal: -300,000 Gwh
- Gas: 200,000 Gwh
- Non-hydro renewable: 100,000 Gwh

Share of gas and non-hydro renewables in the US

- Gas: 25.0% in 2011
- Non-hydro renewable: 10.0% in 2011
Towards a low-nuclear scenario?

Overall, the biggest chunk of the lost nuclear generation is replaced by power generation from coal, leading to a 6% increase in CO2 emissions in the power sector.

Impacts on RE strongly depending on country-specific factors and policies for renewables and climate change.
Conclusions

- Current uncertain context produces both opportunities and challenges for renewables
- Impacts strongly vary from country to country
- Economic crisis and sluggish energy demand outlook has largest impact on RE

- What will be the most important factors affecting RE outlook?