ENERGY AND CLIMATE CHANGE STRATEGIES IN THE EUROPEAN UNION

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Background

- EU has been a leader in climate change negotiations and setting ambitious strategies, visions and targets
- U.S. and Canada pulled out of Kyoto
- U.S. toned down climate change plans but has a coherent energy strategy
- Canada currently has neither a firm climate change policy nor energy vision at the federal level
- Energy profiles and major players are changing and are very different in Europe and North America
- North America emerging to be a net world energy supplier in the near future (IEA (2012))

Energy Export Dependence 2009

Country	Coal Exp/ (prod + Imps)	Crude Oil Exp/ (prod + Imps)	Natural gas Exp/ (prod + Imps)
High Export Dependence			
Norway	71%	80%	94%
Balanced Export-Import Dependence			
Russia	41%	51%	28%
Canada	42%	51%	52%
Australia	76%	34%	39%
High Import Dependence			
EU	7%	8%	14%
US	6%	1%	4%
Japan	1%	0%	0%

Country/Region	Energy Strategy (Name and Date)	Focus of Energy Strategy	Components of Energy Strategy	Definition of Energy Security
United States	Blueprint for a Secure Energy Future (The White House (2011))	Increasing domestic energy supply, reducing energy imports, reduction of energy costs, energy efficiency and R&D for clean energy technologies	(1) Expansion of Domestic Oil and Natural Gas Development and Production (2) Increasing energy supplies worldwide and promotion of switch to cleaner technologies (3) Fuel efficiency standards for vehicles (4) Energy efficiency in buildings (5) Domestic clean energy promotion and support of R&D	Affordable, safe and reliable supply of energy
EU	Energy Roadmap 2050 (15/12/11) Energy 2020 (10/11/10)	Decarbonisation, security of energy supply and competitiveness, develop a long-term European technology-neutral framework	(1)Energy efficiency measures (2)Drastic increase in the share of renewables (3)CCS utilization as of 2030 (4)Nuclear part of the mix but uncertain what exact role it will take (5)Doubling share of electricity in final energy demand (6)Smart technology, storage and alternative fuels	Diversification of fuels, sources of supply and transit routes, protection of EU and foreign investments in energy producing countries, safety and security of oil, natural gas pipelines and related production and transport infrastructure
Canada	n/a	n/a	n/a	Global energy security with a free choice of energy mix (Foreign Affairs and International Trade, Canada)

Country/Region	Projected Energy consumption mix	Institutions Governing Energy Coordination/Strategy	Reliance on unconventional energy sources	Reliance on int. cooperation/markets
United States	2035: 15 % RES and Liquid Biofuels 25% Nat. Gas 32 % Oil 20 % Coal 9 % Nuclear	Federal Energy Regulators Commission (FERC)	Large reliance on shale gas and oil reserves	Reducing oil demand while increasing the supply of oil worldwide and the trade in natural gas, new international framework for nuclear energy
EU	2050: 50 % RES, 25% Nat Gas, 25 % Oil, Nuclear and solid fuels	Agency for the Cooperation of Energy Regulators (ACER), European Network of Transmission System Operators: ENTSO-G, ENTSO-E	Cautious consideration of shale gas	Large reliance, especially interconnectedness in the EU internal market, increased reliance on electricity grids, LNG and natural gas pipeline projects
Canada		Federal Minister of Natural Resources, Council of the Federation, National Energy Board, Canadian Nuclear Safety Commission	Oil sands and shale gas exploration in some provinces (moratorium on shale gas in Québec)	Heavy reliance on international markets particularly the U.S. market, strong urge to diversify market access

EU Energy and Climate Policy

- Mainly developed between 2005 and 2007 before world financial and Euro crisis
- In preparation for UN climate negotiations in Copenhagen in 2009
- EU climate and energy package of 2007
  - 20-20-20 Package
  - 2030 Framework
  - 2050 Roadmap

20-20-20

- A 20% reduction in EU greenhouse gas emissions from 1990 levels by 2020 or 30 % reduction conditional on non-EU countries' cooperation
  - 20 % reduction already in reach and probably achieved by 2014
  - Unlikely to be tightened to 30 %
  - Low carbon price signal from the EU ETS

Renewable Energies

- Raising the share of EU energy consumption produced from renewable resources to 20%
  - National targets but no implementation mechanism
  - Relies to a large extent on controversial biofuel production (potential negative impacts on land-use changes, water consumption), wood pellets from North America and national subsidies
  - Many renewable energy subsidy programmes are significantly cut back or phased out
  - Only Germany, Sweden and Denmark still on track (Fisher and Geden (2013))

Energy Efficiency

- A 20% improvement in the EU's energy efficiency.
- Based on projected not actual consumption rates in 2007
  - No legally binding goals or sector-specific targets
  - Not clear how EU directives will lead to national regulation and if targets will be met
  - Economic downturn did not help as much as with carbon emissions

2030 Framework

- Low Carbon Roadmap aims to reduce emissions by 40 % by 2030 exclusively through efforts taken in Europe alone

Roadmap to 2050

- By 2050, the EU should cut its emissions to 80% below 1990 levels through domestic reductions alone - reductions of the order of 40% by 2030 and 60% by 2040.
- It also shows how the main sectors responsible for Europe's emissions can make the transition to a low-carbon economy most cost-effectively.

Different Approaches and Paths

- EU: Top-down directives and binding targets driven by climate change policy
- Canada: bottoms-up approach with provincial initiatives and weak federal role and leadership
  - Signs of coordination and discussion of national energy strategy, more coordinated approach to energy development
  - However, lack of national coordination on environmental policy
  - Surprising separation of energy and environmental policy
  - No federal push for interprovincial electricity grid integration or electrification of economy

Different Approaches and Paths

- United States: clear national direction driven by energy security and energy affordability
- Substantial advancement in increasing self-sufficiency and meeting Kopenhagen targets without climate change policies
- Not very cautious with unconventional fossil fuels with unknown impacts on groundwater sources etc.

Common Threads

- Nuclear: Global Nuclear Energy Partnership?
- In the near future large dependence on fossil fuels: oil and natural gas in North America and coal and natural gas in Europe
  - Future of CCS
- Energy security common concern
- North America and Europe can benefit from more trade in oil and LNG
- Renewable technologies and storage common R&D concern

ETS Overhaul Plans

- A single EU-wide cap, which will decrease annually in a linear way by 1.74% starting in 2013
- EU-wide harmonized allocation rules. Starting from 2013, power companies will have to buy all their emission allowances at an auction with
  - some temporary exceptions for ‘coal-based’ poorer member states
  - industrial sectors under the ETS that are exposed to significant non-EU competition and thereby potentially subject to carbon leakage will receive 100% of allowances free of charge up to 2020

ETS Overhaul Plans

- Supposed to be extended to aviation, chemical, aluminum and other sectors but running into some obstacles

Why do we need 30% reduction target?

- Target of 20% would not seem to enable the world to reach its envisaged objective under reasonable assumptions
- 30%reduction target combined with a carbon market for the group of developed countries would cut global mitigation costs by about a quarter
- Financing of mitigation and adaptation for developing countries supposed to flow from revenues form carbon market, $ 100 billion

Road Blocks and Changing Paths

- Energy strategy has 3 broad objectives:
  - Decarbonisation
  - Security of energy supply
  - Competitiveness

  But current strategies mostly influenced by decarbonization and climate change

  This seems to be changing due to
  - Euro crisis
  - lack of consensus within EU for mapping the path beyond 2020
  - Eastern European resistance to Low carbon and Energy roadmap
  - In Poland coal more than 90 % of power generation and energy intensity 2.5 times old member states

Road Blocks

- Failing UN climate change negotiations
- Even if EU and US reduce total emissions by 90 % by 2050 compared to 1990 emerging economies need to reduce their emissions equally
- National unilateral decisions that are not necessarily compatible with EU strategies and legislation: e.g. Energiewende in Germany, carbon price floors in the UK
- Underestimated infrastructure costs (transmission grids, pipelines, etc.) that are increasingly difficult to finance

How to guarantee competitiveness in EU

- In past free allocation in ETS
- Carbon crediting?
- Taxing embedded carbon?
- Reinforce innovation and innovation policy and focus on new value chains

Increasing ties and converging paths?

- Due to shale gas revolution in North America more coal is shipped to Europe
- Emergence of global natural gas market will bring continents closer together
- Canada's plan to diversify energy markets and to reverse pipelines to the East will open up opportunities to export to Europe
- Climate change action is needed but current "grand coalition" global approach under the leadership of Europe can no longer be relied on

Future directions

- Further trade links (EU-Canada, EU-US free trade deals) will require environmental policy harmonization especially on carbon emissions, contentious issues:
  - Fuel Quality directive
  - Carbon pricing of non EU airlines entering Europe
- Closer integration of emissions trading and carbon prices
- Further advancements in renewables will depend on progress in storage and smart technologies, joint R&D and applications
- CCS needs to be jointly developed and tested

Areas of cooperation

- Focus on short lived GHGs such as black carbon, methane and tropospheric ozone to reduce temperature by 0.4-0.5 C between 2010 and 2050, especially relevant for the Arctic
- Green growth and technology transfer to developing countries
- Reducing emissions from deforestation, REDD+
- Bring carbon-efficient technologies to market at sufficient scale