

Green energy in Emerging Europe

Expanding the role of renewables in the generation mix

4th Emerging Europe Energy Summit
3 October 2008

David Cox

Pöyry Energy Consulting

- The leading advisor to the European energy sector
- A pan-European energy consultancy formed from the merger of five highly respected consultancies



- Over 250 energy market experts in 15 offices across Europe:
 - Copenhagen – Düsseldorf – Helsinki
 - Madrid – Milan – Moscow
 - Oslo – Oxford – Paris
 - Stockholm – Stavanger – Vienna
 - Villach – Zurich – London

Pöyry Energy Consulting supports clients throughout the energy business



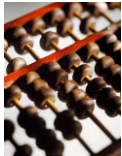
Strategy

We help our clients to build stronger, more competitive, long-term positions throughout the energy value-chain, by focussing on the goals and activities that generate value



Business Operation

We improve the performance and competitive position of our clients by developing and implementing innovative energy markets solutions



Valuation & Financing

We apply our extensive expertise, projections and models to the valuation of businesses, projects and contracts to assist in the financing of our clients' energy market activities



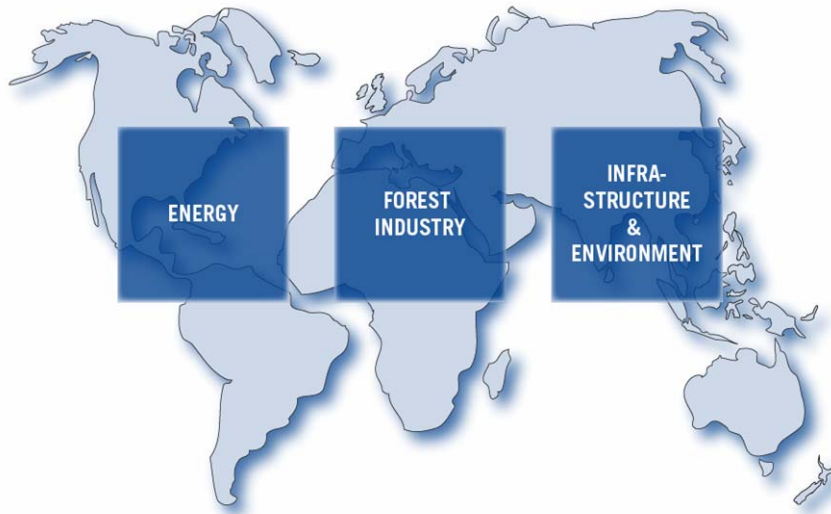
Sustainability

Delivering long term success increasingly requires companies to demonstrate environmental competence and social responsibility in their actions. Our experience helps us to find sustainable solutions for business and the wider environment

Clients

Utilities
Generating Companies
Wholesalers
Traders
Distribution Companies
Shippers
Retailers
Market Operators
Independent System Operators
Transmission Companies
Governments
Large Consumer
Regulators
Non-Governmental Organisations
Financial Institutions
Trade Associations
Manufacturing Companies

Pöyry Plc – global consulting and engineering company



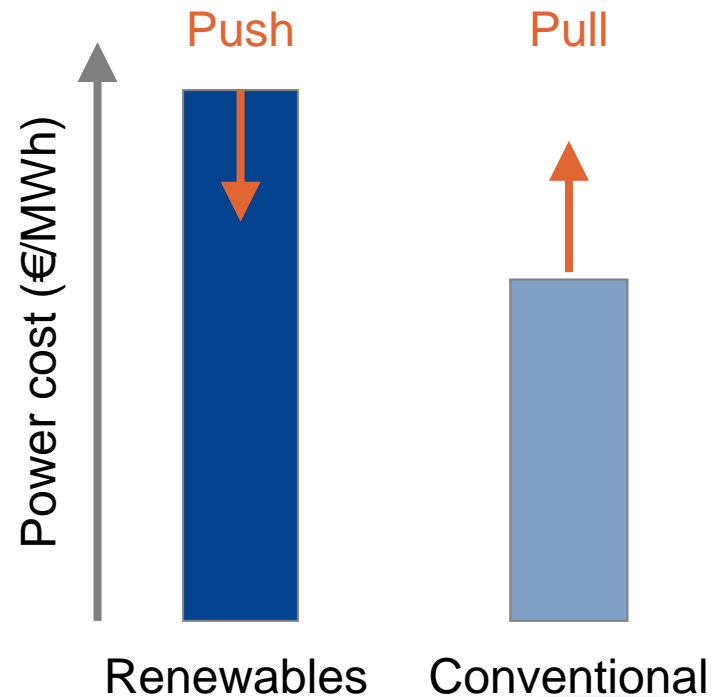
- Client- and technology-oriented globally operating consulting and engineering firm
- Core operations based on three know-how clusters:
 - Energy
 - Forest Industry
 - Infrastructure and Environment
- Global market leader in forest industry
- Strong international position in energy, and infrastructure & environment
- Office network in 45 countries

Drivers for renewable energy

On 23 January 2008, the European Commission published three draft directives related to Climate change – renewables, CO2 reductions, energy efficiency



- 2020 renewables directive
- National targets and regulations
- Increasing carbon price
- Security of supply
- High and volatile fuel prices

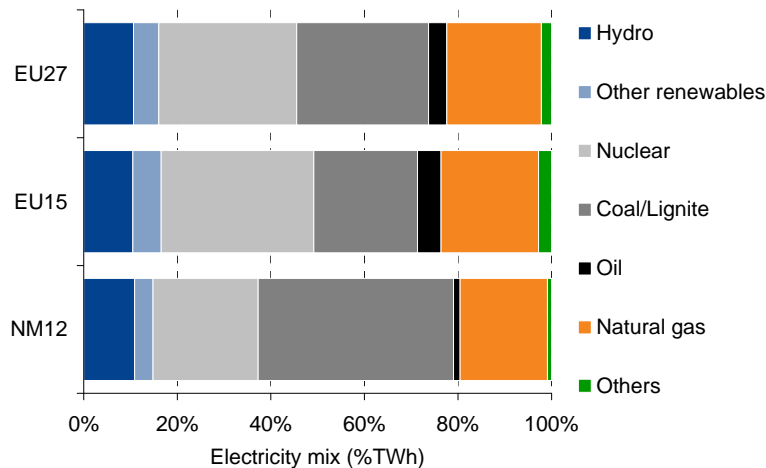


In the short term, the main driver for investment is likely to be the financial support for renewables

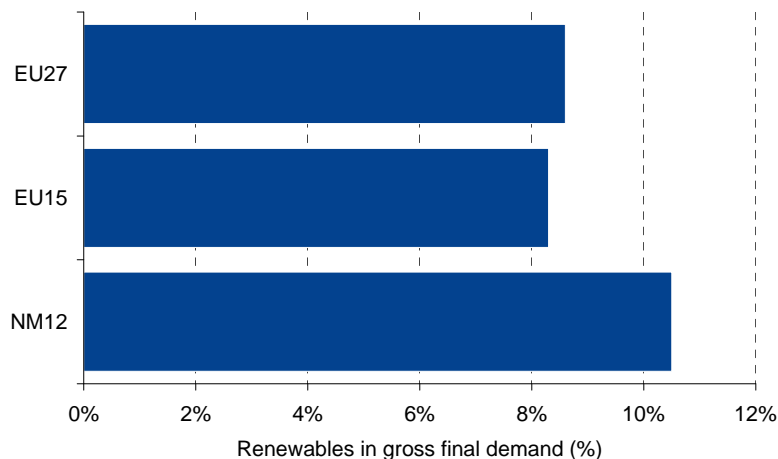
In the longer term, the fundamentals may change!

Current situation in Europe

Electricity mix in Europe



Renewable energy mix in Europe



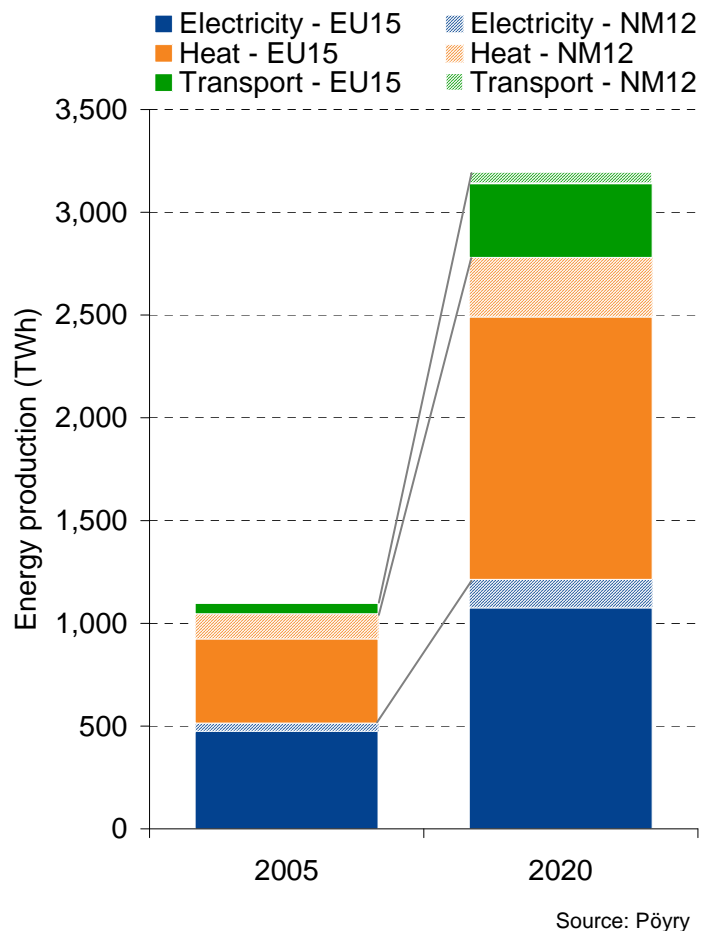
- Current renewable penetration in the energy mix is around 8.5%
 - mainly hydro in the electricity sector (+ some wind and geothermal for the EU15)
 - mainly biomass in the heat sector
- New European members characterised by
 - a higher share of coal in power production, and
 - a higher share of renewables in total demand (electricity, heat, transport)
- While the energy dependence is comparable between EU15 and new members, sources are less diversified in Eastern Europe

An immense challenge ahead

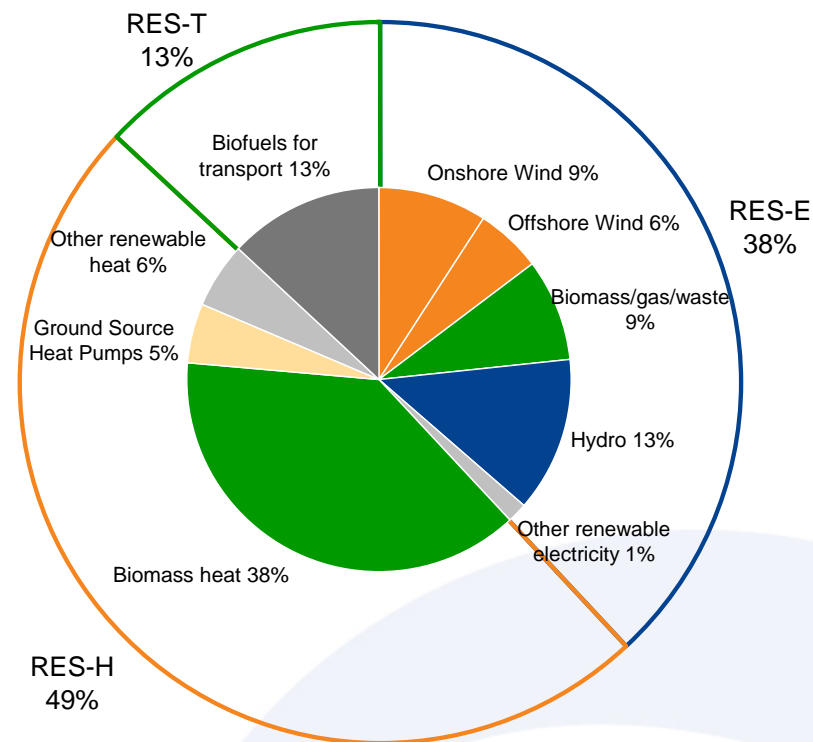
The 2020 renewables target requires that Europe trebles its renewables production

Pöyry estimates a requirement for €1,000bn of investments between 2010 and 2020

Energy required to meet the 2020 target



Mix of renewable energy in 2020

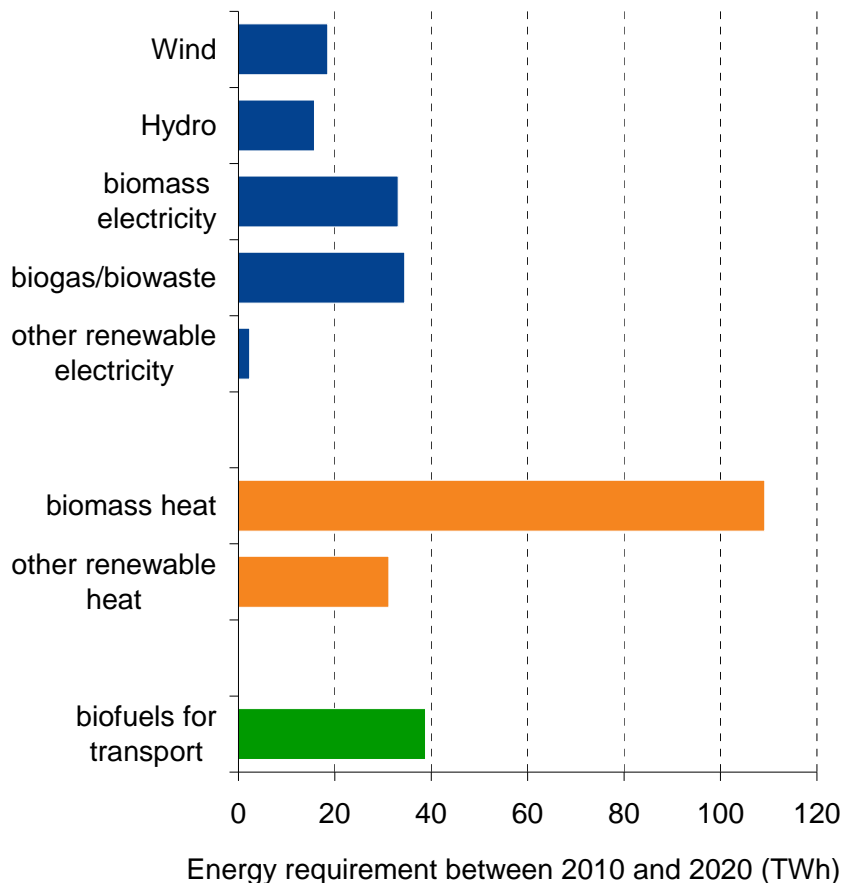


Source: Pöyry

Biomass expected to deliver most of the increase

The European Commission estimates a significant additional potential for cheap biomass in all of Europe

Mix of additional energy required to meet the 2020 target for the 12 new members

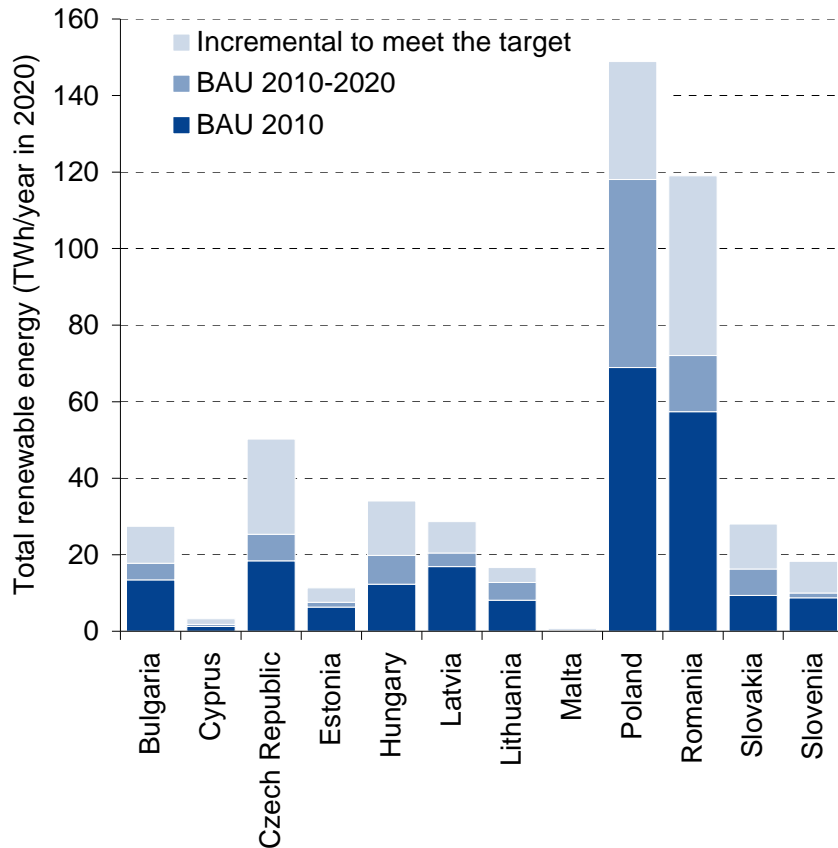


Source: Pöyry

- Pöyry estimates that the emerging European economies need 300TWh of additional renewable energy to meet the 2020 target
- Around 300TWh of additional primary biomass fuel will be required
- A minimum of 15GW of wind will be deployed. Important upside requirement if
 - the biofuels target is not maintained/met
 - the heat sector doesn't deliver the expected growth

What are the challenges?

Impact of the 2020 Renewables target



- High stress of the renewables supply chain: the 2020 target expected to increase the requirement for renewables by 260% compared with current policy
- We estimate that €4.3bn of additional support will be needed per annum
- Substantial regulatory changes will be required to attract more investments, to put in place sustainable support for renewables...
- Significant penetration of intermittent generation could lead to very high volatility of electricity prices

...but the renewable industry can also bring opportunities

- Investments
 - the renewables target is expected to attract hundreds of billion euros investments over the period 2010-2020
 - infrastructures (grid, market, etc.) will benefit from these investments
- Long-term benefits (fuel free, security of supply, ...)
 - renewables need to be supported over a 15-year period, but the technical lifetime of the projects is often higher than 30 years
 - higher retail electricity prices and energy efficiency incentives will ultimately reduce energy demand
- Employment
 - the European Commission projects that the 2020 renewables target will create 650,000 jobs in Europe
- 'Trading' of green power with Western Europe countries
 - the burden share to meet the 2020 target is higher in Western Europe, and new members could take advantage of lower cost renewables resource

What changes meeting the targets would bring ?

- Emissions
 - Renewables built between 2010 and 2020 expected to cut emissions by 500MtCO₂/year in 2020
- Fuel mix and new entry
 - Less need for new entry: for example, no need for new entry in the UK by 2020 **IF** all the targets (energy efficiency, CO₂, renewables) are met
 - This compares with 12GW of new entry by 2020 under Business as Usual
- Less gas dependence
 - the emerging countries would decrease their energy dependence on Russia

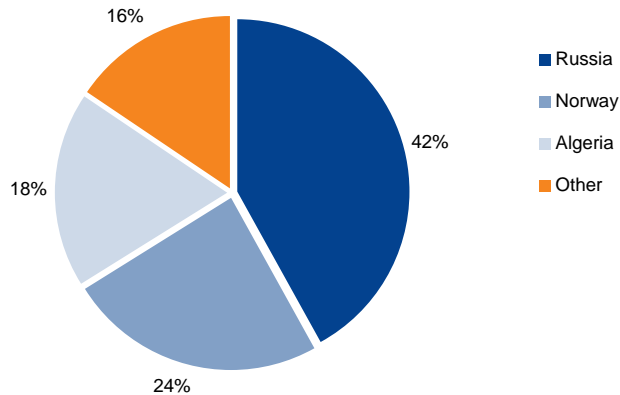
Is Russia reliable?



Russia stokes Europe's fears of energy supply

Europe's import dependence on Russia

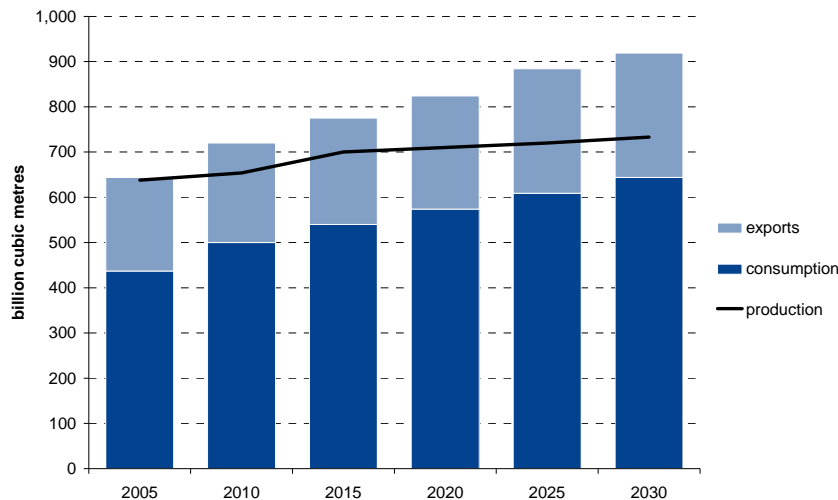
Gas imports into the EU-27 in 2006



Source: Eurostat; Pöyry estimates

- Falling production in West Siberia
- Under-investment in new provinces
- Rising costs of production
- Gas flaring and limited TPA to Gazprom pipelines
- Non-liberalised domestic market and growing domestic consumption
- Downturns in political relations delaying economic decisions (e.g., Shtokman)

Russia's production and exports to 2030



- Slowly rising production
- Russia's increased reliance on gas imports from Central Asia
- Attempts to secure Libyan, Nigerian, Algerian gas
- A political decision will have to be made as to which pipelines are to be filled

The construction of pipelines bypassing transit states gives Gazprom the option of reducing supplies to those states

Perceptions of Russia's reliability vary across the EU ...

Traditional partners have strong relations with and sizeable interests in Russia:

- Germany
 - supports the construction of Nord Stream
 - considers asset swaps to be a viable tactic (e.g., Yuzhno-Russkoye, Achimgaz)
- Austria:
 - supports the construction of South Stream
- France and Italy:
 - prefer the security of long-term contracts
 - have shown willingness to give Gazprom (limited) access to domestic consumers

Interests of emerging European states diverge:

- Slovakia is interested in continuing to transit large volumes of Russian gas
- Bulgaria promotes the construction of South Stream
- Poland seeks to reduce import of Russian gas (e.g., build an LNG regas terminal)

Is diversification an option?

David Cox

Pöyry Energy Consulting
King Charles House
Park End Street
Oxford, UK
OX1 1JD

+44 (0)1865 722660
www.poyry.com
www.illexenergy.com