

“Renewable Energy – From Analysis to Action”

Joint RETD/REWP workshop,

OECD Conference Centre, Paris, 15-16 March 2011

Chairman’s Summary

By Hans Jørgen Koch, RETD & REWP Chairman.

During the two days workshop, 10 experts gave keynote speeches, and a further 17 experts participated in facilitated discussions. In addition, around 150 invited participants in the workshop contributed with questions and comments during the discussions.

The purpose of this summary is not to cover everything that was said during in the past two days, but to record a few main points.

1) The urgency of moving from analysis to action.

In recent years, the IEA’s World Energy Outlook has consistently pointed out, that if the world’s ambition of limiting global warming to no more than 2°C over pre-industrial levels should be met (the “450 Scenario”), there is a need for an *energy revolution*, i.e. a far-reaching transformation of the global energy system. Current commitments are not enough. Even if implemented fully, commitments for emission levels in 2020, as made in the Copenhagen and Cancún meetings of the United Nations Framework Convention on Climate Change, are collectively not enough to put the world on a path that would give us even a 50-50 chance of achieving the 2°C goal.

Even so, the climate goals remain attainable, but the door is closing and will be definitively closed in 2020, unless a “phenomenal policy push” by governments will be realized. Recent work by the International Energy Agency has concluded that without full implementation of the Copenhagen & Cancún agreements, there is a real risk that the 2°C goal will be pushed out of reach altogether.

The energy revolution will not happen overnight. As the IEA has shown, 80 percent of projected emissions in 2020 are already “locked-in”, as a result of power plants that already exist or are under construction. This limits the room for maneuver and underlines the sense of urgency for action. Thus, investments in the energy sector will only slowly change the overall composition of the sector, because once you have invested in a power plant, it is likely to exist for the next 30-40 years. What we do now and in the next 10 years will therefore determine much of the state we will be in 40 years down the road.

Achieving even greater certainty of avoiding climate change is even more difficult, yet not impossible: RETD analysis shows that achieving 400 ppm CO₂-eq is feasible but requires immediate and significant action.

2) Large-scale deployment of renewable energy is necessary to achieve deep GHG reductions at minimal direct cost.

The message from the energy scenarios of the IEA is consistent: The IEA *World Energy Outlook 2010* and *Energy Technology Perspectives 2010* scenarios show that a major contribution from Renewable Energy is necessary in order to de-carbonize the energy sector and meet energy security concerns.

Fuel switching and efficiency is important but cannot do the job alone. In the *Energy Technology Perspectives 2010* “Blue Map” scenario, renewable energy accounts for 17% of the reduced CO₂-emissions in 2050, nearly three times as much as nuclear power and 70% more than CCS.

In *World Energy Outlook 2010* Renewable energy’s share of electricity generation needs to more than double from 19% in 2000 to 45% in 2035, if a 450 ppm trajectory is to be followed (i.e. pursuing the 2°C target).

Independent research done for RETD/REWP shows the potential for even higher shares, with renewable energy becoming the dominant energy source after 2030. In this 400 ppm scenario 70% of all electricity would be produced by renewable energy by 2060 and the electricity sector would be virtually de-carbonized by 2030, assuming the commercial availability of carbon capture and storage (CCS) after 2020.

Stakeholders at the workshop from the energy sector noted that CCS is unlikely to be (commercially) available for anything between one and several decades. Moreover, recent tragic events in the nuclear sector in Japan also raises uncertainty as to whether nuclear power will be able to contribute at the levels envisioned in the various scenarios.

Both of these uncertainties associated with CCS and nuclear power respectively, may result in greater attention being paid to alternatives such as renewable energy. But this cannot be taken for granted.

3) Transforming the global energy system is likely to lead to economic benefits.

Including renewable energy benefits other than those included in the WEO or ETP (or for that matter all similar economic models of the energy system), renewable energy deployment can be considered even more advantageous. This is due to substantial economic benefits of reduced fossil fuel dependence costs and reduced climate change adaptation costs. Analysis conducted for the RETD shows that the costs of NOT modernizing the energy system are tremendous. The analysis further demonstrates that the desirable, large-scale conversion to renewable energy can take place and that the net costs of doing so are small to negative. Climate change and security concerns will go hand in hand driving de-carbonization and energy independence. Policies should therefore integrate such otherwise non-tangible benefits for market actors.

Most global economic models used to examine climate adaptation and damage costs oversimplify the modeling of the energy sector. RETD would therefore like to see “externalities” better incorporated into detailed energy system models. Fossil fuel dependence costs are significant and comprise a range of elements: wealth transfer, paying above market prices (because producers have market power), economic losses from price shocks, price volatility, military expenditures and health & environmental impacts.

Much research still needs to be done: Quantification of price volatility impacts could be useful, and most studies cover only selected elements, regions, or countries. Also, limited work has been done to assess the economic effects of coal and natural gas dependence. This is particularly relevant because, coal's environmental and health impacts may already exceed the market value of the coal produced.

In the transport sector, measures to improve fuel economy, expand sustainable biofuels and promote the uptake of new vehicle technologies must be prioritized. This will bring about the cost and security benefits of cutting oil import bills and is also crucial in reducing greenhouse gas and other pollutant emissions.

4) Recent events in Northern Africa and The Middle East have demonstrated the vulnerability of the oil market.

Even though Libya represents only around 2% of global oil production, the political uncertainty in the whole region has caused significant increases in oil prices, causing concerns in the OECD as to whether the nascent economic recovery will be harmed.

The era of cheap oil is over, replaced by an era of high and fluctuating oil prices. Any economy dependent on oil – particularly imported oil – is a fragile economy. The price of being dependent on imports is not only economic but also political.

5) Some governments are starting to pursue independence from fossil fuels.

At least one government, Denmark, has taken up the challenge and recently unveiled an energy strategy that describes how Denmark as a country can achieve independence from coal, oil and natural gas by 2050, and at the same time significantly reduce its greenhouse gas emissions.

The Danish Government's energy strategy contains a range of initiatives that will reduce the energy sector's use of fossil fuels by 33 percent in 2020 compared with 2009, by further expanding Danish renewable energy capacity. The needed investments in energy efficiency and renewable energy will not be negligible, but the Danish government considers the alternative, i.e. continued dependence on fossil fuels, to be even more expensive in the years to come.

In just ten years, the government's initiatives aims at doubling the renewable share of electricity to 60 percent - up from 29% today. Wind power will take the lion's share of this, covering 40 percent of electricity consumption. It comes at a price but a reasonable one: less than 3 Euros per month per household.

6) The tragic events in Japan cast uncertainty on the future of nuclear power.

While nuclear power represents a significant share of electricity generation in many countries, uncertainty about it following the tragedy in Japan may shift investments to other energy sources. However, it is far from certain that the alternatives will be problem free. This is particularly the case if investments will be

made in coal fired power plants, because of the high CO₂ emissions associated with burning coal, the air, water, and public health impacts of coal mining and combustion, and the technology lock-in of such investments.

7) A “golden age” for natural gas?

The IEA is talking about a possible *golden age of gas*, driven by increased shale gas production in the US, and increased supplies of liquified natural gas (LNG), particularly in Asia.

Is cheap, abundant natural gas a friend or foe of renewable energy? Either way, it will likely affect renewable energy deployment. It will be a ‘friend’ if it acts as a flexible source of generation to improve integration of variable renewable energy production, in particular, wind and solar PV. It will be ‘foe’ if it competes with renewable energy investments.

Looking at plans for the next ten years, natural gas is the default option in the OECD. But natural gas demand will grow even more outside the OECD, particularly in Asia, and this will put considerable pressure on prices.

Uncertainty appears to be the rule of the game at the moment. Decisive factors will be the role of shale gas as well as the development and price of LNG supplies.

8) The renewable energy industry.

The renewable energy industry has made enormous progress and is moving far down the learning curve: Production has been scaled up, costs reduced, and performance has improved. The industry is committed to continue to do so in the future, provided that a stable and predictable policy context exists. Such a context will help to optimize the supply chain, drive innovation, scale up production further, and further reduce costs.

With 39 GW added in 2010, total global installed wind generation capacity grew to approximately 200 GW. This follows up on a remarkable 2009 where, in Europe, more new wind power capacity was installed in the EU than any other electricity-generating technology: 39% of all new capacity installed in 2009 was wind power, followed by gas (25%) and solar photovoltaics (17%).

Solar PV is experiencing dramatic cost reductions, with system prices falling by 40 percent in 2008/2009. Further cost reductions are expected, which should help solar PV achieve grid price parity in many countries over the next decade.

At the workshop, the naissance of the Renewable Industry Advisory Board was announced. The RIAB is a selected group of leading industrial stakeholders from the renewable energy sector, who will volunteer - under the umbrella of the REWP - to provide professional advice to the IEA Renewable bodies. This will help IEA to get additional insight on significant industrial, market, regulatory, financial and innovation trends and

to identify follow-up actions, with special emphasis on key elements useful to implement solutions for a large scale deployment of renewable energy technologies inside and outside OECD-countries.

9) Finance and policies.

There is no shortage of money, but rather a shortage of a stable and predictable policy context. Finance is not a barrier to RE deployment provided that such stable and predictable policies exist.

The point was made that we need to subsidize what we want and remove subsidies from what we don't want. Feed-in-tariffs for renewable energy is a success story, providing certainty to the market, but also needs to be adjusted to learning and cost curves. Feed-in-tariffs is not a stand-alone measure but needs to be part of a broader strategy, providing a stable investment climate, while at the same time adjusting to developments in technologies, competitiveness and markets.

Other speakers stressed the need for governments to create a long-term strategic commitment to renewable energy coupled to clear targets and a stable policy environment.

Moreover, effective strategies must recognize that there are various phases of a technology, from basic R&D, initial market penetration, to mass-deployment - and policies need to vary depending on what phase a technology is in.

If it is a technology being subsidized, then the implication is that eventually the subsidy should be eliminated. But if it is the benefits of the technology that are being supported, then it is more likely that the support will be there for the long term, since the benefits will never diminish.

Also, the stability of a support mechanism is highly dependent on where the money comes from: If it comes from taxpayers, then it is more likely to be unstable, as politics gets in the way. If it comes from ratepayers, it is more likely to be stable.

At the workshop also the potential role of frontrunners in different industry-sectors was addressed. Two (related) barriers for large scale deployment of renewables are (1) institutional inertia that hinders the actual implementation of these technologies (permitting, access to grids, et cetera), and (2) mis-perceptions about the positive role of renewable energy in energy systems, which in turn hinders the willingness to remove these institutional inertia. Currently, many utilities and manufacturing industries recognize the benefits of renewables, and they could act as important promoters for policy changes.

10) Renewable heating needs attention too

Renewable energy is not just about electricity, but also about heating. There is an unexploited potential for renewable heat, but it faces specific issues. For both electricity and heat, however, there are different policy landscapes among countries – in addition to the various stages/phases for countries and technologies.

11) The way forward.

The workshop was held under the title “Renewable Energy: From Analysis to Action”. The workshop showed that while action is already here, but much more needs to happen. The advantages of renewable energy are multiple and well-known. There is a need for governments to realize the “phenomenal policy push”, the 2010 IEA World Energy Outlook has asked for, but also an important role for industry in helping create the conditions in which the right policy context can be created by governments.

27 April 2011