

« Energy Efficiency and Renewable Energy - A key to a better tomorrow »
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[1] Ladies and gentlemen, it is an honour to address you today and I thank the ISO, in particular, Secretary-General Rob Steele, for the invitation. I am very sorry that I cannot be with you in person in the beautiful city of Cape Town. Important commitments related to the IEA's biannual Ministerial meeting have kept me away.

Before I turn to the crucial topic of energy efficiency and renewable energy, let me tell you a little about the IEA. Founded during the oil crisis of 1973 to 74, the IEA's initial role was to co-ordinate measures in times of oil supply emergencies, like Hurricanes Katrina and Rita in 2005.

But as energy markets have changed, so has the IEA. Our mandate has broadened to include the "Three E's" of balanced energy policy making, namely: energy security, economic development and environmental protection. We can also add a fourth "E" - Engagement Worldwide - as the IEA is now actively working with non-member countries and international organisations - including the ISO.

The importance of international cooperation on energy matters is growing. In particular, such cooperation is an essential element of meeting the two biggest energy challenges we now face - energy security and climate change.

[2] The graph in my second slide, which is taken from the IEA's World Energy Outlook 2008, shows world primary energy demand to 2030 in the 'business as usual' scenario. It shows that demand will grow by 45% from 2006 to 2030; with an average annual growth rate of 1.6%.

Non-OECD countries account for 87% of global energy demand growth between 2006 and 2030, with China having the greatest growth. Fossil fuels will account for around 80% of the overall increase in energy demand between now and 2030. Coal, an increasingly important part of the energy mix, becomes the second most important energy source after oil. Overall, this rapid demand growth would lead to increased competition for energy resources, higher imports and a greater reliance on OPEC, all of which would heighten concerns over energy security.

[3] Alongside the energy security challenge, we have the added challenge of rising energy-related CO₂ emissions and climate change. In our World Energy Outlook 2008, the business as usual scenario (shown as the top line in my third slide) sees energy-related emissions in OECD countries as rather stable. But an increasing share of emissions would come from non-OECD countries, as the green section of the chart shows.

Globally, energy-related CO₂ emissions would jump by 45% from 2006 to 2030 to reach 40.6 gigatonnes in the business as usual scenario. This represents a growth rate of 1.6% per annum and would put the world on track for a global temperature increase of around 6 degrees.

This all points to one conclusion. Our current energy trends are unsustainable - socially, environmentally AND economically. So the IEA is urging all governments to encourage a shift to cleaner and more efficient technologies that can curb the growth in carbon emissions while also contributing to enhanced energy security.

Energy efficiency and renewable energy - the focus of your meeting today - have a crucial role to play in addressing this challenge.

[4] We at the IEA have tried to respond to this pressing challenge by developing two alternative energy policy scenarios that would lead to lower CO₂ emissions. The first is the 550 ppm scenario, which would equate with around a 3 degree Celsius rise in temperature by the end of the century. And as shown here in my fourth slide, the second is the 450 ppm scenario. This second scenario would mean a temperature rise of around 2°C and a 50% reduction of current levels of CO₂ by 2050.

This graph shows that to achieve 450 ppm, we would need to lower emissions from 41 Gt in 2030 in the business as usual scenario to 26 Gt in 2030. This would amount to a 15 Gt reduction from business as usual. The graph also shows the trajectories for all energy-related CO₂ emissions to 2030 in the 450 ppm scenario, with the red line representing global GDP growth of 3.3%. As you can see, the 450 ppm scenario really means a decoupling of economic growth from CO₂ emissions.

[5] This fifth slide shows what clean energy technology measures must be taken to achieve 450 ppm. Let us be clear - this chart does not indicate which countries should shoulder these efforts. Developed countries will need to assist

developing countries in climate change mitigation if we are to achieve 450ppm globally.

What it does show is that 2/3 of the emissions reductions would need to take place in non-OECD countries. This is because that is where the most economic growth will happen: GDP growth in OECD countries will be 2% per annum, while it will be 4.8% in non-OECD countries. A 'greener paradigm shift' is needed in these countries as they grow.

As you can see from this chart, measures in 3 areas are vital:

First, energy efficiency plays the largest role globally in reducing CO₂ emissions. Globally, it represents an enormous 54% of CO₂ reductions to 2030. The World Energy Outlook 2009, which will be released on 10 November in London, will further emphasise the importance of frontloading energy efficiency measures. We cannot wait to improve energy efficiency. We must take action now.

Next, renewables make the second largest contribution to annual CO₂ emission reductions, accounting for 23% of reductions.

Third, nuclear must play a role, while CCS after 2020 is also key.

Before turning to my sixth slide, let me add that the IEA is now disaggregating the data you see here to show country-by-country and region-by-region information in the WEO 2009. To inform the international climate change negotiations, we will release an early excerpt of the WEO 2009 at the next round of post-Kyoto negotiations, to be held in Bangkok later this month.

[6] As mentioned, energy efficiency will play the most crucial role. This sixth chart shows that energy efficiency has delivered significant benefits already. A study of 11 IEA Member countries showed that without energy efficiency improvements, total energy use would have been 58% higher in 2005 than it actually was.

So, in a very real sense, energy efficiency can be considered the most important fuel; more important than oil itself.

And energy efficiency not only enables us to lower our CO₂ emissions. It also helps us to meet that other central energy challenge - enhancing energy

security. By consuming less, we also rely less on traditional sources of energy, such as oil and gas.

[7] To assist governments in taking this action, the IEA has identified 25 best policy practices across 7 areas of activity - as shown in my seventh slide - which we recommended to the G8 in 2008. These recommendations show significant energy savings across the buildings, appliances, lighting, transport and industry sectors, among others.

At this year's G8 Summit in L'Aquila, the IEA reported on progress in implementing the 25 recommendations in G8 countries. We reported that even in the best performing countries of the G8, around 40% of the potential energy savings from these recommendations remains to be captured. We will release a similar analysis of progress in implementation in all IEA Member countries at the IEA Ministerial in October this year.

[8] As you can see in my eighth slide, the energy savings potential is huge. If implemented globally and without delay, these 25 energy efficiency measures would together save 8.2 Gt of CO₂ by 2030. This is more than the current energy-related CO₂ emissions of the USA and Japan combined!

Let me discuss just one sector in more detail to emphasise this point. Buildings account for 40% of energy use. Simply by renovating buildings to meet higher energy efficiency standards and replacing outdated heating systems, we could cut this percentage in half. Strong codes for new buildings would take this further.

Our recommendations in this and other sectors highlight the important role of standards in improving energy efficiency. First, international cooperation in this field is essential for reducing the overall costs of policy development - by avoiding the need for every country to develop its own policies and testing procedures from a starting point of zero. Second, international standards help to ensure the safety and reliability of energy efficient products - from building insulation, to light bulbs to washing machines to industrial appliances. This is crucial for encouraging consumer and government confidence in the importance of energy efficiency. Third, it helps to ensure policy consistency among countries, which is useful for the international trade of products. Fourth, international standards assist with the effective implementation of policies - by avoiding the need to develop costly testing procedures in every country and by providing for the consistent monitoring of CO₂ emissions and energy savings.

This last point on implementation and monitoring is sometimes overlooked. We now have these 25 recommendations as well as other good energy efficiency policies. We know how we can achieve huge savings. But what we need to do is: Implement! Implement! Implement! And a central part of implementation is monitoring progress. This was highlighted in the Bali Action Plan from the 2007 climate change negotiations, which states that emissions reductions activities should be Measurable, Reportable and Verifiable. To monitor, we need internationally recognised, credible measuring methodologies. So the IEA very much supports the need for standardised methods and indicators for monitoring progress with energy efficiency and CO₂ emissions.

Recognising the importance of standards for all of these reasons, the IEA has been working with the ISO, industry federations and other relevant organisations for several years now, as well as engaging with IEA non-Member countries, on energy best practices. You may know that since we began working more closely with the ISO in 2006, we have together developed a common position paper on international technical standards for energy efficiency and worked together on a major international conference in Paris, among other activities.

The IEA applauds the ISO for its adoption of a resolution earlier this year that encourages the ISO's technical committees for energy intensive industries to progress standardisation in their sectors. We also welcome the subsequent work on standardisation in the iron and steel sector, and look forward to similar progress in other energy intensive sectors, such as cement and aluminium. The IEA looks forward to the continued efforts of the ISO to contribute to energy savings and CO₂ reductions globally, and we are here to collaborate.

[9] Turning to the power sector, my ninth chart illustrates the scale of transformation needed in this sector if we are to achieve a lower emissions future. This is more than a money issue. Power sector emissions need to be cut by two-thirds in the 450 policy scenario, relative to the business as usual scenario.

The annual global capacity additions needed in the 450 ppm scenario over the period 2012-2030 are as follows. 20 nuclear plants per year, 50 hydro plants per year, 18 000 wind turbines per year, 300 CSP plants per year, and 30 coal & gas CCS plants per year.

The real challenge here is how to get around the Not In My Backyard Syndrome, to show the general public that everyone must accept such changes if we are to avoid climate change.

[10] Let me say a few words now on renewable energy. This tenth graph highlights what the IEA's 450 ppm scenario would mean for electricity generation. It shows that the share of fossil fuels would decrease from 2006 levels, while renewable electricity generation would have the biggest growth.

Worldwide, renewables would increase from 18% in 2006 to 40% in 2030. In terms of the regional breakdown, this would mean a 36.5% increase in OECD and EU countries, and a 44% increase in the rest of the world.

Making this scenario a reality will require rapid, global deployment of all current renewable energy technologies, as well as the successful commercialisation of technologies that are now only at the development stage. For these ambitious projections to become reality, it is essential that governments introduce robust energy policies, in order to attract investments.

[11] IEA research points to several principles of sound policy design for encouraging renewables. Our 2008 publication, "*Deploying Renewables: Principles for Effective Policies*" - shown here in slide eleven - highlights four such principles.

First, support must be long-term, steady and transparent in order to attract investments, and reduce risk to an acceptable level. Second, support levels should decrease over time to encourage technologies towards competitiveness. Third, policies should be tailored to suit technology maturity: different technologies at different stages of maturity need different types and levels of support. A one-size-fits-all approach risks locking out technologies that have long term value. And fourth, policies must be system-friendly by taking into account the overall impacts on an energy system - such as grid reliability - as the penetration of renewables increases.

An international framework is also of critical importance. The post-Kyoto climate policy regime needs to be robust and establish an appropriate carbon price. This will help level the playing field on which renewables can compete with other energy technologies.

Finally, standards - including those set by the ISO - also have a crucial role to play in fostering the widespread, safe and cost-effective use of renewables.

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ISO standards are vital for all areas of renewable energy, from small-scale biogas utilisation to solar water heaters. As you will no doubt hear this afternoon, international standards are crucial for: the quality assurance of manufacturing plants and testing laboratories, the design of products and production plants, and the performance, reliability and safety of products. As a result, standards are also crucial for convincing both consumers and policy makers that renewable energy products are worthwhile. So for this, we applaud and encourage the ISO for its work on international standards in the renewable energy sector.

[12] Before concluding, I wish to make a comment on the role of both technology roadmaps and investment in ensuring that energy efficiency and renewable energy foster energy security and respond to climate change.

First, on technology: recognising that each technology has particular needs in terms of industry and government support, the G8 leaders in Hokkaido in 2008 asked the IEA to develop global technology roadmaps for the most crucial energy technologies. In this twelfth slide, you can see a complete list of the technologies we are working on, for both the supply and demand sides.

Throughout this year, we have been working on roadmaps for solar PV, wind, electric/hybrid vehicles, CCS, nuclear energy and cement. We will complete other roadmaps from this list next year in time for the G8 meeting in Canada. Again, I would emphasise that comprehensive, properly developed international standards are part of ensuring the full deployment of technologies in many cases.

[13] Second, on investment, it is important that I make a point about the cost of moving toward a low-carbon future, particularly given current economic conditions. Our 2008 World Energy Outlook showed that in the business as usual scenario, investment of \$26.3 trillion is needed in energy infrastructure to 2030, just to meet growing demand and production decline. By comparison, in our two low emissions scenarios, significant additional investment is needed in power plants and in more energy energy-related capital stock.

As shown in this 13th slide, the 450 ppm scenario would require a substantial shift in investment patterns and a major transformation of the way investment decisions in the energy sector are taken. For example, it would require further power plant investments of \$3.6 trillion and efficiency investments of 5.7 trillion from 2010 to 2030, in addition to the investments needed in the

reference scenario. In total, these additional investments amount to 0.6% of world GDP on average per year.

There is a danger, given the current economic and financial crisis, to delay or cancel efforts to reach our climate and energy security goals. But the IEA argues that the current crisis should be seen as an opportunity to move toward a cleaner, more secure energy future. We must ensure that sound energy investment strategies are at the heart of every economic stimulus package, and that such stimulus proposals are fully followed through and implemented. At the same time, governments can provide positive signals to investors by combining short-term recovery measures with a long-term policy perspective.

[14] Ladies and gentlemen, in conclusion, our current energy trends are unsustainable - economically, socially and environmentally. A major decarbonisation of the world's energy system is needed, in both OECD and non-OECD countries.

Energy efficiency and renewables, alongside nuclear energy and CCS, must be fully embraced if we are to achieve a 450 ppm scenario.

We should also bear in mind that measures to mitigate climate change will often enhance our energy security.

The economic and financial crisis should be seen as an opportunity - rather than a challenge - to move toward a cleaner, more secure energy future.

We must ensure that sound energy investment strategies are at the heart of every economic stimulus package and are properly implemented.

Finally, let me add that, with regard to energy efficiency and renewable energy, international standards play a vital role by: reducing the costs of policy development; ensuring policy consistency; monitoring energy and CO₂ savings; ensuring the quality, performance and reliability of energy products; and building consumer and government confidence in energy efficiency and renewable energy. In this regard, I again applaud the ISO for its strong efforts to improve standards in the energy sector.

I am sorry that I cannot be with you in person today, but I thank you very much for inviting me to talk to you nonetheless. I wish you a fruitful and productive meeting.