

***Ensuring Green Growth in a Time of Economic Crisis:
The Role of Energy Technology***
Mr. Nobuo Tanaka, International Energy Agency
G8 Environment Ministerial Meeting
22 April 2009, Siracusa, Italy

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Distinguished Ministers, distinguished delegates, ladies and gentlemen, it is an honour for me to address you this afternoon.

I wish to begin by thanking Minister Prestigiaco for this opportunity to be with you today.

The topic which I want to address is one that concerns us all - how do we ensure green growth at a time of economic crisis?

We at the IEA believe that it is possible to find ways to both stimulate our economies and lay the groundwork for a more sustainable future. For both, low carbon technologies can play a key role.

But before I talk about possible solutions, let us be clear about the CO₂ challenge we are facing.

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The energy sector accounts for more than 80% of global CO₂ emissions and 60% of global greenhouse gas emissions.

In WEO-2008 business as usual scenario, emissions from OECD countries are rather stable. While an increasing share of these emissions will come from non-OECD countries.

Between 2006 and 2030, global CO₂ emissions from energy will jump by 45%. This trajectory of a 45% growth in emissions puts the world on track for a global temperature increase of around 6 degrees to the end of the century.

We must be careful. National and global decisions taken today that lock-in existing conventional technologies will shut the door on substantially reducing CO₂ emissions in the future.

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To ensure green growth, there must be long-term national policies and global agreement on climate change policies. We need both.

The biggest challenge is to address the entire energy sector in all countries.

In the IEA's *World Energy Outlook 2008* last year, we proposed two scenarios that lead to 550 ppm stabilisation and 450 ppm stabilisation.

Both scenarios assume a hybrid policy approach that combines a cap-and-trade system with sectoral agreements and national policies & measures.

Under the 550 scenario, Other Major Economies are assumed to implement national policies and measures in the power generation, industry and buildings sectors. It is also assumed that they would participate in sectoral agreements in the iron & steel, cement and transportation sectors.

But to achieve the 450 scenario, Other Major Economies are assumed to participate in the cap and trade system in power generation and industry. But this is from 2020 onwards, leaving plenty of time to prepare for such a system.

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To achieve the 450 ppm scenario, a 'revolution' of the energy sector is needed. In particular, measures in three areas are vital:

Energy efficiency certainly plays a key role. It accounts for 54% in the 450ppm scenario. CCS is also important, particularly after 2020. It accounts for 14% of the ppm scenario. Also, Diversification of the energy mix through the use of nuclear power and renewable is needed.

But the power generation investment needed for this revolution is significant.

This 'revolution' would equate to global capacity additions every year of the equivalent of:

- 18 000 wind turbines (of average size of 3MW each)
- 300 solar plants of 100 MW each
- 50 hydro plants (of around 1000 MW capacity)
- 30 coal and gas plants integrated with CCS technology
- 20 nuclear power plants (of around 1000 MW capacity each)

We need all of these infrastructure investments to achieve 450 ppm. With respect to energy efficiency, the IEA has identified 25 best policy practices across 7 sectors of activity, which we recommended to the G8 last year. If implemented globally, these 25 measures combined would save 8.3GT of CO₂ by 2030. This is greater than the current energy related CO₂ emissions of the USA and Japan combined.

In relation to energy efficiency, the IEA has been asked to host the Secretariat for the International Partnership for Energy Efficiency Cooperation (IPEEC). IPEEC will bring together

the G8, Brazil, China, India and Korea, Mexico and the EC, with more countries expected to join the the near future. IPEEC will enable countries to work together to promote energy efficiency globally.

The IEA wants to continue its work in energy efficiency as much as a possible.

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This chart is very new. It shows that to achieve 450 ppm, CO2 reduction measures must be taken in both OECD and non-OECD countries. We differentiate between the two. Just under 60% of the measures needed in non-OECD countries are in energy efficiency.

As you can see, energy efficiency plays a key role with respect to emissions reductions in both OECD and non-OECD countries.

Beyond an OECD/non-OECD breakdown, the IEA can also play a key role in relation to providing more detailed country-by-country analysis with respect to CO2 emission reductions.

This is a good opportunity for me to make an important announcement.

Given the significance of this year's climate change negotiations in Copenhagen, and the key role that IEA data will play in providing the energy sector context for those negotiations, I have decided to exceptionally release an early excerpt from the IEA's *World Energy Outlook 2009's* climate change analysis.

This will be released alongside the UNFCCC negotiations in Bangkok in late September – early October and will contain the latest trends on energy and greenhouse gas emissions – as well as a region-by-region account of the pathway and investments needed to realise the 450 Policy Scenario that you see in this slide.

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Ladies and gentlemen, let me go back to the important role low carbon technologies play in climate change mitigation.

This graphic shows the various stages through which any new energy technology has to pass to get from the laboratory to commercialisation. It also shows the wider context within which this process happens.

Today many important low-carbon technologies have higher costs than carbon-intensive technologies. Only through RD&D and market deployment will these costs come down.

Some technologies needed to revolutionise the global energy system are still at the R&D stage (advanced photovoltaics and fourth generation nuclear power).

Many others require further refinement and cost reductions to become fully commercial (CCS and offshore wind).

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To support low carbon technologies, the G8 leaders in Hokkaido asked the IEA to develop global technology roadmaps.

Here you can see a complete list of the technologies we will be working on. We have identified 17 roadmaps, on both the supply side and the demand side.

During 2009, we will work on roadmaps for solar PV, wind, electric/hybrid vehicles, CCS, nuclear energy; and in conjunction with the WBCSD - the cement industry.

We are taking an integrated approach. For example, with electric vehicles, there is little point having such vehicles unless you have zero carbon electricity.

Further roadmaps will be completed in time for the G8 meeting in Canada next year.

To prepare a roadmap, we bring together experts and officials from all concerned countries and sectors to lay out in practical terms what's needed with respect to technology, R&D investment, deployment financing, policy and regulatory environments, and international cooperation.

The IEA has calculated that around USD 15 trillion must be spent globally on research, development, demonstration and deployment of these technologies in order to make them fully commercial, with the vast majority of the money spent on deployment (USD 14 trillion).

We believe that these roadmaps can help direct how this money is spent and ensure earlier commercialisation of these technologies.

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A key element of these roadmaps is to look at what specific policy support might be needed. The answer requires an approach tailored to the maturity of a given technology.

During the development stage, technologies are supported by incentives to create market interest, such as subsidies.

More mature technologies that are still expensive need a stable and long-term support framework that allow industry to improve performance and reduce costs. Feed-In Tariffs/ Feed-In Premiums or Tenders can provide this framework.

For more advanced technologies, the aim is to move towards more market-oriented incentives such as Feed-in premiums or Tradable Green Certificates with technology banding.

Once the technology is close to competitive, specific support systems can be phased out and if an appropriate carbon price exists, these technologies can compete on a level playing field with others.

So, yes, an international framework will be very important but until then national policies are essential until such a framework is in place.

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But it is not possible to discuss policies and deployment without considering the current financial crisis.

Compared to year-on-year increases in renewable investment of 60-70% between 2004 and 2007, it seems investments in renewable energy slipped significantly in 2008 - growing only 5% in 2008. And what may happen in the future?

Projects that were attractive a year ago are less so today.

We are hearing similar messages with respect to energy efficiency investments.

But today's economic stimulus packages provide an excellent opportunity to ensure green growth in the energy sector.

We calculate that IEA member countries have committed or plan to commit close to USD 128 billion towards EE. Packages in several IEA member countries also provide support for renewables, especially renewable electricity generation.

The IEA will be watching the effect of these packages on clean energy technologies very closely over the next few months, and we will report to the G8 Summit on the impact of the financial crisis on energy investment.

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Let's look at which activities could have the biggest benefits in terms of dealing with the current crisis and also curbing CO2 emissions?

This chart shows options in terms of how easily they can be implemented. Some clean energy investments have long lead times and so will not meet this criterion.

Perhaps the best options lie in the buildings and transport sectors.

Retrofitting buildings can quickly provide jobs in building and manufacturing, as well as decrease energy bills for consumers in the mid to long term.

Incentives for the production and purchase hybrid and electric vehicles can go a long way towards lowering CO2 emissions.

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To conclude, the global economic slowdown must be viewed as an opportunity to mitigate climate change.

It is quite clear that current trends in energy supply and use are unsustainable.

To change our energy path, it will take an energy revolution but the consequences of doing nothing will be far harder and more costly in the long term.

The widespread deployment of low carbon technologies are at the centre of the changes we must make.

Deploying such technologies will require an integrated policy approach.

Now is the perfect time to begin this energy revolution. Governments should utilise today's stimulus packages to invest in energy efficiency and low carbon technologies.

This sort of 'Clean Energy New Deal' not only generates economic growth in the short term, but it also will help us win the fight against climate change in the longer term.

Finally, with respect to climate change, this year's negotiations in Copenhagen will be critical. The IEA looks forward to supporting those negotiations with timely data on the energy sector context.

Thank you.