

Achieving clean energy economies through accelerated international action
Keynote Speech by Nobuo Tanaka, Executive Director, International Energy Agency
Clean Energy Ministerial, 19 July 2010

Slide 1



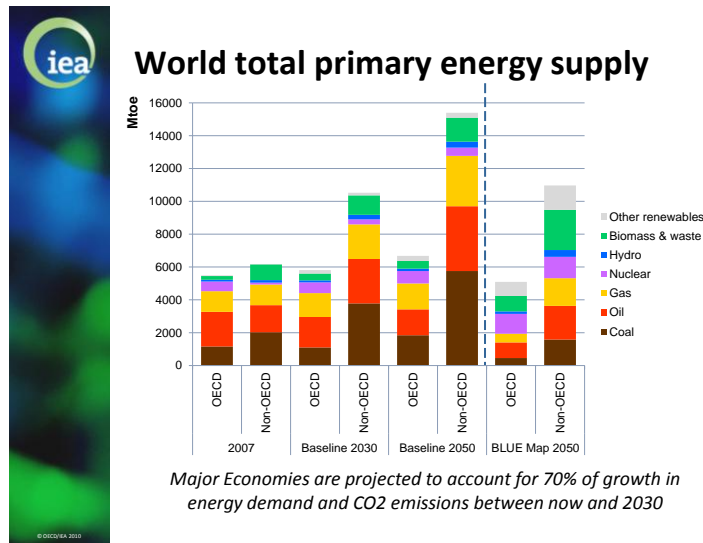
Secretary Chu, Ministers, ladies and gentlemen, I am honored to join you at the first ever Clean Energy Ministerial Meeting and I wish to thank Secretary Chu and the US administration for the invitation to speak to you today.

I applaud you for coming together at this high political level to discuss national and global collective efforts to accelerate the world's transition to a cleaner, more secure energy future.

As IEA analysis has been showing for some time, without major changes to the way we produce and use energy, we will confront untenable risks to our collective energy security and to the environment in the future. Indeed, the Deepwater Horizon accident in the Gulf of Mexico is a tragic reminder of this.

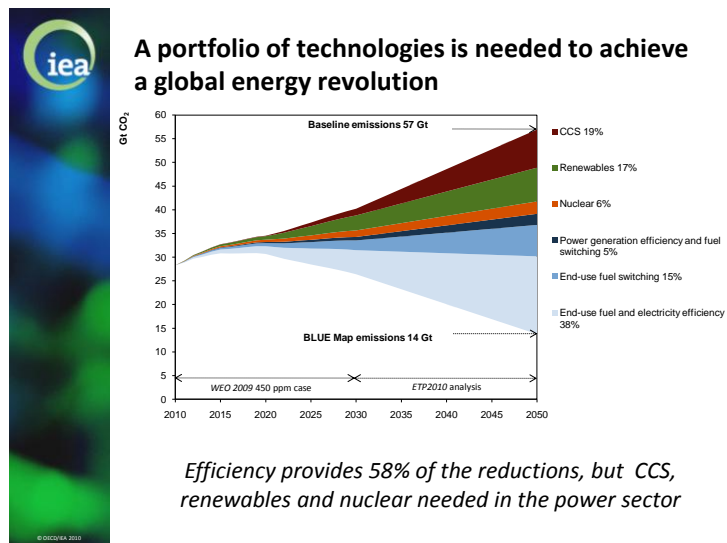
As energy ministers, you have the opportunity to catalyse the necessary changes. I hope that this meeting will provide a forum for meaningful action and cooperation. Let me now share with you a few of the IEA messages.

The IEA has prepared three background papers for this meeting that set out opportunities for international action in all of these fields. I encourage you to take a look.



Let's start with the context – where are we currently headed in terms of our energy use? The answer is down the wrong path! But we have the power to correct this if we act now. Earlier this month, the IEA released the 2010 edition of *Energy Technology Perspectives*. Looking at our current trajectory, in the *ETP* business as usual (or 'baseline') scenario, where no new policies are implemented, total primary energy supply should increase over 80% between 2007 and 2050.

Energy related CO₂ emissions double by 2050, rising oil and gas imports and high prices also feature. Most of the growth in energy use will occur in non-OECD countries where fossil fuel demand increases very rapidly. This highlights the need for a global collective effort to address our energy and climate change challenges.



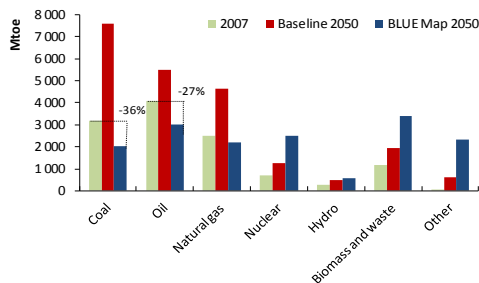
But the goal of *ETP* is to show which technology policies and options will halve global CO₂ emissions (from 2005 levels) by 2050. We call this the BLUE Map Scenario [consistent with a long-term global temperature rise to 2° - 3° C]. Achieving the BLUE Map scenario is indeed possible, but it is an extremely challenging goal that requires a portfolio of technologies and emissions reductions across all sectors, as well as strong political commitment. To achieve Blue Map by 2050, additional investments (relative to the Baseline scenario) of 46 trillion USD are needed between 2010 and 2050 globally. These additional costs will be more than offset by fuel cost savings: undiscounted savings are estimated at 112 trillion USD, but a carbon price of USD 175 / t CO₂ is needed. A This is a huge business opportunity.

So how can governments move forward? IEA work has shown that the first essential step is **improving energy efficiency**. Often called the ‘quiet giant’, end-use efficiency accounts for 38% of total emissions reduction in 2050. Secondly, I want to highlight the importance of **decarbonising the power sector** – this will be critical to achieving deep emissions reductions, but requires aggressive investments in nuclear, CCS and renewables. We must also look for ways to transform global energy markets so that clean energy becomes the rule, not the exception. Thirdly, we must move towards decarbonising the **transportation** sector. We will need improved vehicle efficiency and the mass introduction of electric vehicles, among a host of other actions.

Slide 4



Primary energy demand by fuel and by scenario

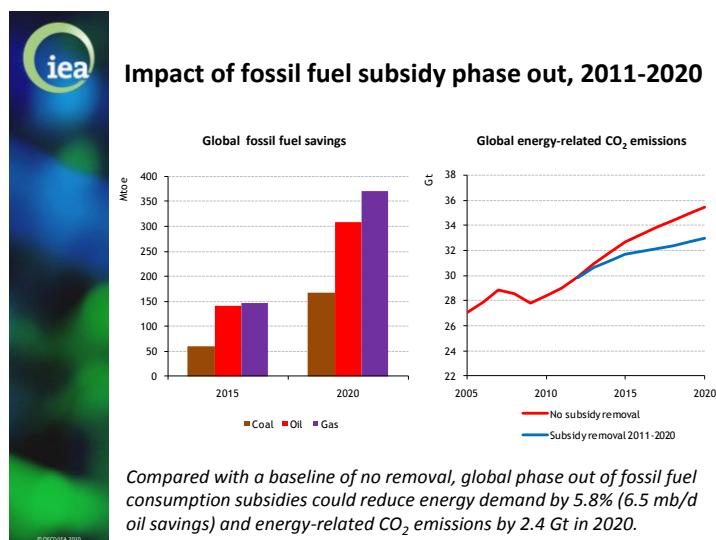


By 2050, coal, oil and gas demand are all lower than today under the BLUE Map scenario.

The BLUE Map scenario provides an opportunity for a very different future. In this scenario, primary energy demand for fossil fuels is 26% lower in 2050. Fossil fuel dependency in the energy mix should drop from 81% today to 46% in 2050.

Coal, oil and gas demand in 2050 are all lower than today. For instance, global oil consumption is reduced by about 27% compared to current levels. Demand should peak earlier than the supply peak.

And let me be clear – this alternate future is not just about cutting CO₂ emissions. Reduced demand and diversified energy sources help to improve energy security.



Another important policy action for major economies is the phasing out of fossil fuel subsidies, which impedes the uptake of energy efficiency and cleaner energy technologies. Such subsidies reduce incentives for more efficient energy use, distort market signals and create dependence on fossil fuels. It causes revenue losses for producers, marketers and electricity generators.

In 2008, fossil fuel consumption subsidies (where the end-use price is below the full economic cost of energy) reached USD 557 billion [USD 187 billion in Major Economies]. If these subsidies were phased out over the next 10 years, in 2020 we could achieve:

- 5.8% decline in energy demand [2.9% in MEs];
- 6.5 mb/d in annual oil savings [1.4 mb/d in MEs]; and,
- 2.4 Gt annual reduction of energy-related CO₂ emissions [1.0 Gt in MEs].

Major economies can play a leading role in phasing out subsidies as they for a 1/3 of the global fossil fuel subsidies.

Many countries are already taking measures to reduce or eliminate fossil fuel subsidies (China, India, Russia and Indonesia for example) . We applaud these efforts and we support the G20 commitment to phase out inefficient fossil fuel subsidies by further monitoring the progress.



Transforming markets for clean energy products

- Many successful national case studies for clean energy market transformation
 - CFLs, energy-efficient motors, solar PV, fuel-efficient vehicles
- More can be achieved through international collaboration
 - Harmonised test protocols and standards for EE products
 - Common EE incentives for appliance manufacturers
 - Similar solar PV incentives programmes
 - Coordinated electric vehicle pilot efforts

Another key area of action is market transformation. We need to transform global markets for energy so that clean energy products and services become the mainstream rather than “alternatives”.

In the background paper the IEA prepared for this meeting, we found success stories in energy-efficient products like refrigerators and motors, where we have seen real market transformation occur. The IEA has also looked at solar PV and fuel-efficient vehicles, products that are rapidly growing in market share due to effective domestic policy.

We must all learn how to apply these lessons learned to other promising clean technologies. We can – and must – build upon national successes to achieve a more rapid global market transformation. Let me elaborate a little more, starting with appliances.



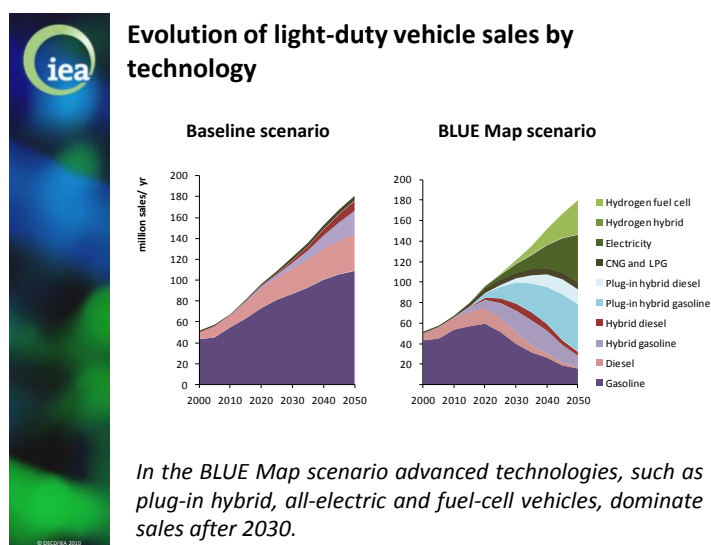
Global cooperation can transform end-use electrical equipment markets

Action needed to accelerate market transformation on:

- 1. Refrigerator and freezers**
- 2. Domestic lighting**
- 3. Televisions**
- 4. Air conditioners**
- 5. Electric motors**
- 6. Network standby power**

For market transformation to continue, we need action across the full range of appliances. By adopting practical forms of cooperation, major economies can provide the much-needed leadership in this critical area. International cooperation through sharing of best regulatory practice in the first four areas on this slide alone could deliver 900 Mt of CO₂ savings cumulatively by 2030. In this regard, we applaud current efforts under CEM, such as the 'SEAD' or Super-efficient Equipment and Appliance Deployment initiative.

Secretary Chu earlier showcased family refrigerators, which today consume two-thirds less energy than they did 30 years ago, while delivering a better service. But these great transformations took 30 years so they need to be accelerated – global cooperation cannot replace national action but it can build on and accelerate it.

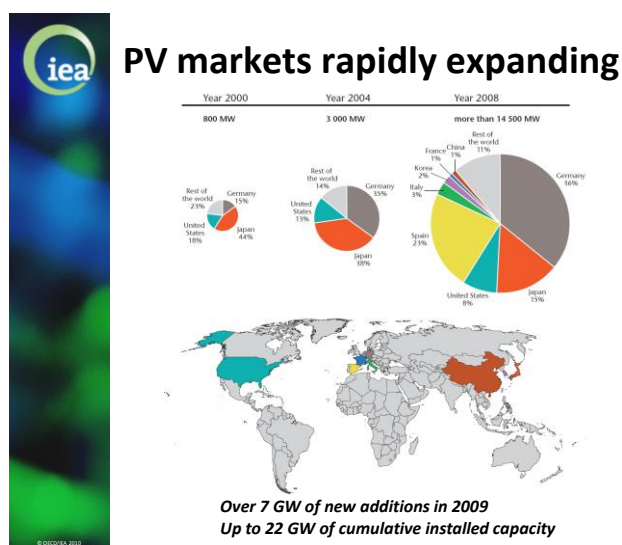


Another sector where significant action is essential – and where we can make a difference -- is transportation.

Improving the fuel economy of light-duty vehicles is one of the most cost effective transport measures available to cut CO₂ emissions. We are making real progress on this front - by 2020 higher fuel economy standards could save around 2 million barrels of oil per day by 2020! However a number of large countries still do not have fuel economy standards. We would encourage all major economies to move to the adoption of such fuel standards and to continue to improve these in the future. In this regard, the IEA supports the worldwide target of the Global Fuel Economy Initiative to see a 50% cut in fuel use per km by 2030 (vs 2005).

In addition to efficiency, new advanced vehicle technologies could transform the transport sector. This is an extremely encouraging development – if we can reach annual sales of 5 million electric and plug-in hybrid electric vehicles by 2020, as many countries and companies have announced, we will be well positioned to reach the *ETP BLUE Map* target of over 1 billion such vehicles on the road in 2050. Such a future could save 15 million barrels per day by 2050.

The IEA very much welcomes the advanced and electric vehicle initiative proposals under the CEM and looks forward to working closely with the Major Economies on these activities.



Let us now look at the case of PV. The global PV market has experienced vibrant growth for more than a decade, with an average annual growth rate of 40% and cumulative installed PV power capacity rising from just 0.1 GW in 1992 to about 22 GW at the end of 2009.

Apart from this exponential growth, the other important signal for market transformation is the geographical spread of PV. Until 2006, PV was almost solely concentrated in 3 countries, namely Germany, Japan and the US. Now, other countries are playing an increasing role such as Spain and Italy. China is now the largest PV manufacturer in the world. We also note India's national solar mission to achieve 20 GW by 2022. Developments in the PV market are driven by strong support policies being implemented in an increasing number of countries, which we applaud.

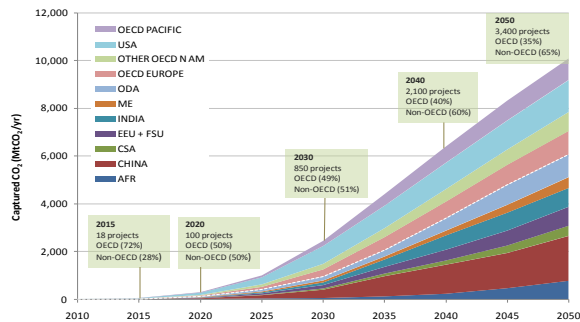
In the ETP's High Renewables scenario, 75% of global electricity will come from renewables. PV generation could reach 12% (4500TWh) of global production. Total solar electricity generation, including concentrating solar power, could reach 20 to 25% of global power generation in 2050.

But this will only happen with appropriate policies and market transformation measures, including incentives and standards. [note and applaud the various renewables related initiatives being announced here at the CEM (SLED, wind and solar working group, sustainable development of hydropower, bioenergy working group). Let me also take this opportunity to note the IEA's own International Low-Carbon Energy Technology Platform, which aims to serve as a delivery mechanism for international collaboration on low-carbon energy technologies and which we warmly invite all of you to take part in.

In fact, several of the countries around this table are members of the steering group guiding the Technology Platform's evolution. In our view the Technology Platform could be a vehicle for maintaining momentum and co-ordination between Clean Energy Ministerial meetings and for reaching out to countries not represented here.



Decarbonising the Power sector: CCS is one part of story alongside nuclear and renewables



Moving on from market transformation, let me touch briefly on CCS, as I know that this is something of interest to many of you here and it is another key technology for a low-carbon future.

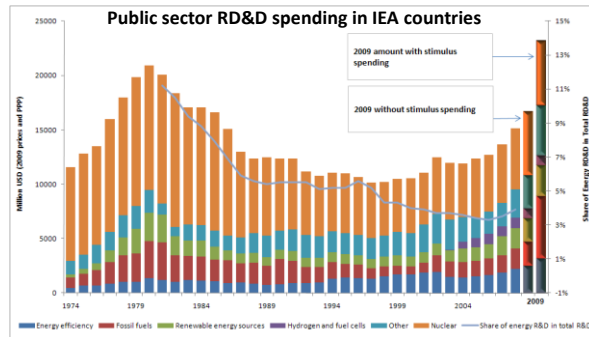
This graph shows where the projects will need to be installed if we are to achieve the BLUE Map scenario by 2050. OECD countries must lead in the first decade, but the technology must quickly expand to the developing world: by 2050, 65% of the projects must be located in non-OECD countries.

Last month, we submitted a report to the G8 Leaders in Muskoka on progress with the 2008 Hokkaido G8 CCS goals. We reported that there has been significant progress since 2008. 80 large-scale projects are now under way globally. 5 projects are now in operation and 1 will follow soon. Governments have pledged over USD 26 billion to support early demonstration and to facilitate 19-43 large scale projects by 2020.

Let me express the IEA’s strong support for the CEM’s own Carbon Capture Use and Storage Action Group, to be announced at your meeting here.



**Public clean energy RD&D:
Post-stimulus strategies needed**



**Stimulus packages are a one-time funding increase;
how to achieve sustained higher levels of investment?**

Moving on from market transformation, another vital area of action is support for RD&D. Secretary Chu has already outlined the key IEA findings with regard to this graph. Let me simply reiterate that we need to raise the level of annual spending to 2 – 5 times pre-stimulus [2008] levels, to 20-50 billion a year or at a minimum stimulus spending levels.

In 2009, governments around the world allocated more than USD 520 billion to clean energy technologies – from energy efficiency in buildings, to high-speed railways to support for renewable energy technologies. Of this amount, about USD 22 billion was directed to RD&D.

The bar on the far right shows what a dramatic rise this was from previous years: the 2009 amount on low carbon technologies exceeds the previous peak spending period in the early 1980s. Much of this increase is accounted for by stimulus spending.

While the 2009 figure minus stimulus spending is still an increase on 2008 and this is a promising step, it is not enough. Governments around the world face many funding priorities – but we must think beyond the short term, and indeed beyond election cycles, in order to achieve long term results.

The IEA’s latest Global Gaps study on RD&D concludes that when today’s levels of government energy RD&D spending are compared against the levels needed to achieve global clean energy goals for 2050, we need to raise the level of annual spending 2 – 5 times pre-stimulus [2008] levels, to 20-50 billion a year. At a minimum, we need to sustain the levels achieved with stimulus spending in 2009. The challenge is here, under the aftermath of the global economic crisis, can we continue these spending levels!



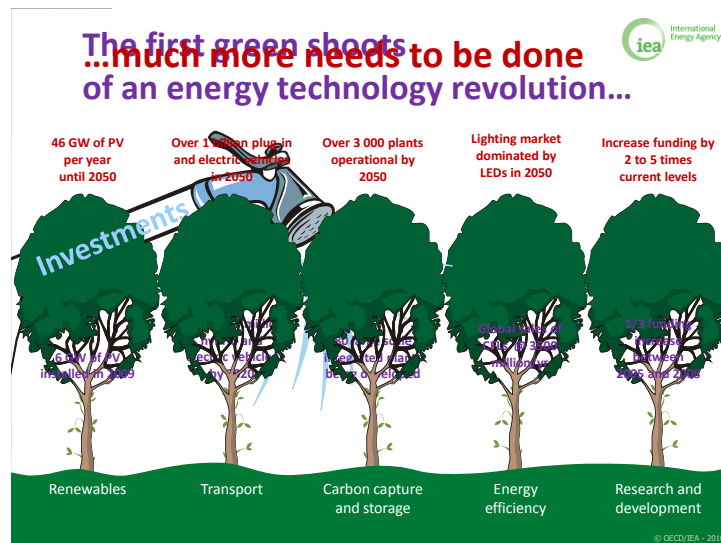
Incentivising Investment

- Public spending is one proven way to accelerate economic growth and energy technology innovation
- Need to leverage new private investment by providing long-term, stable standards and incentives
- More of these types of strategic approaches are needed:
 - **India's National Clean Energy Fund** for research and innovation, financed by a levy on coal
 - **Korea's "Green New Deal" strategy**, which funds 17 new growth engines and supports RD&D
 - The **US Advanced Research Projects Agency – Energy**, helps high risk, high return technologies bridge the valley of death
 - The **UK's Green Investment Bank with \$3B** in initial funds for large-scale clean energy demonstration projects
 - **China's 2009 investment in electricity grid development** in 2009 was its highest ever, and plans to invest **\$44B in advanced vehicles** t over the next 5 years

One important way to support RD&D is to enlist the private sector.

Spending by the private sector on technology innovation is currently low. When compared against other sectors, the energy sector spends the smallest portion of its sales on R&D – less than one-half of one percent [19% for healthcare, 12% for defense, 8% for information technology, and 2% for the automotive sector.] Governments must increase incentives to raise industry RD&D spending, for example, by setting long-term, predictable policies that create stable technology markets.

We are seeing some promising examples of national policies aimed at addressing some of the key gaps in technology development. For example, India recently approved a levy on coal production that will result in nearly USD 500 million per year for new clean energy RD&D. And Korea's 'green new deal' strategy has become globally known, with Korea leading the way in green spending in recent years. The US and the UK have also addressed key areas where technology development has often stopped – the valleys of death at pre-commercial development and in large-scale demonstration. They have done this through the creation of targeted new institutions such as ARPA-E [Advanced Research Projects Agency – Energy] and the Green Investment Bank. I appeal to all of you to build on these and start other initiatives.



Ladies and gentlemen, in conclusion, there are early signs that the energy revolution that the IEA has been calling for is now happening. We are seeing increased renewables deployment in many regions - in 2009 alone, 6 GW of PV was installed globally. Funding announcements are being made to support CCS demonstrations and 80 large scale plants are currently being developed. Companies and governments are announcing ambitious plans for the roll-out of electric vehicles with plans for 5 million vehicles by 2020. Governments are committing to spend more on RD&D and spending has increased by a third between 2005 and 2008.

But while this news is encouraging, we must lock in and accelerate this revolution. [CLICK SLIDE] Governments must maintain stimulus package spending on green growth *and* then expand spending for key technologies. We have to enhance our focus on energy efficiency and change in the power sector must be accelerated – for example, annual capacity additions for PV must average 46 GW per year until 2050 and we need over 3000 CCS projects by 2050. What’s more, we need significant infrastructure projects (such as smart grids and recharging infrastructure) to support the deployment of electric vehicles which would need to reach over 1 billion vehicles in 2050.

We still have formidable challenges before us, but each day we wait, the challenge becomes harder – every year of delay adds USD 500 billion to the cost of action. As energy ministers of the world’s major economies – representing vital engines of global economic growth and nearly 80% of global energy demand in 2008 [75% in 2050] – you have the capacity to lead this revolution. We applaud and encourage your efforts thus far. Let’s act to grow these long-awaited green shoots NOW. We simply cannot stand still and wait for a global climate deal - you can make this secure, cleaner energy future a reality through your actions. The IEA would be pleased to continue to contribute to the Clean Energy Ministerial process. Thank you.