

# World Energy Outlook: China & India Insights

## Emerging Giants & New Priority Agenda for IEA

By **TANAKA Nobuo**

**AFTER** taking my place as the Executive Director of the International Energy Agency (IEA), I have just launched my first World Energy Outlook (WEO), which this year focuses on China and India. Introducing the key points of this important analysis of the energy future, I would like to discuss issues we are facing as the IEA and the world.

### Enhancing Engagement with Emerging Giants – China & India

In the Reference Scenario in this year's WEO, in which government policies are assumed to remain unchanged from mid-2007, projected global energy demand in 2030 is 17.7 billion tons of oil equivalent (toe), 4% higher than in last year's edition and the supply and emission trends are worsening. What is going on? One key factor is sustained high levels of economic growth in the new giants of the world economy. China and India together will account for nearly half of the entire growth in world energy demand between 2005 and 2030, based on the Reference Scenario. China is likely to have overtaken the United States to become the world's largest emitter of energy-related CO<sub>2</sub> this year, and will surpass the United States to become the world's largest consumer of energy by around 2010. India will be the third largest emitter of energy-related CO<sub>2</sub> by 2015 and third largest oil importer in the world in 2030.

The share in world energy demand of developing countries with transition economies – including China and India – will reach 61% in 2030 from the current level of 51%. OECD countries' share will continually decline from 49% to 44% in 2015 and 39% in 2030. Thirty years after its establishment, the IEA is facing a new reality in that its member countries, 26 industrialized countries, will no longer dominate world energy demand. The coordination of cooperation with the world's largest and third largest energy consumers is imperative or the impact of IEA emergency preparedness and improvement of energy efficiency will have limited effects on the world energy market in future. The relationship between these two emerging giants and the IEA is rather mutually beneficial. China and India themselves want to improve their emergency preparedness and find a sustainable path for their high economic growth. There is a huge potential for our further cooperation. The IEA should definitely enhance its substantial engagement with these countries. With this recogni-

tion, I said in my foreword in this WEO 2007: "It is one which I shall do my best to safeguard and develop, hopefully paving the way, with the support of all the governments concerned, to an ultimate objective of their future membership" in the IEA.

### Enhancing Long-term Energy Security via Consumer-Side Approach

To meet the 17.7 billion toe of energy demand in 2030, which is 55% more than the current level, a total of \$22 trillion of investment in the supply side will be necessary. When we see the global oil supply prospects to 2015, the oil supply/demand balance is set to remain tight. OPEC and non-OPEC producers have already announced plans to add 25 million barrels per day to gross capacity through 2012. However, according to our analysis, 37.5 million barrels per day of gross capacity additions will be needed in total between 2006 and 2015. Within this total of 37.5 million barrels, 13.6 million are to meet demand and the rest to replace a decline in existing fields. Thus, a further 12.5 million barrels per day of gross capacity would need to be added, further highlighting the pressing need for capacity investment.

How can we manage this situation? Requesting producers to make further investment is of course very important. Another way is changing our own energy demand. Notably, improvement of our energy efficiency and diversification of energy resources will be the most reliable and often the most cost-effective methods to diminish this gap between supply and demand in future. These are policies that we can initiate ourselves. The WEO 2007 Alternative Policy Scenario, which assumes the adoption of a set of policies and measures that governments around the world are currently considering, shows us how these consumer-side policies can create a huge result. In the Alternative Policy Scenario, global energy demand in 2030 will reach 15.8 billion toe – 2 billion toe or 11% less than in the Reference Scenario. That saving is roughly equal to the entire current energy consumption of China. As for oil, global demand in 2030 is projected to reach 102 million barrels per day – 14 million barrels per day lower than in the Reference Scenario. This is roughly equal to the combined current oil output of the United States, Canada and Mexico. However, the timing of policy imple-

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mentation is crucial; delaying the implementation of these policies and measures by 10 years would reduce the above-mentioned energy saving in 2030 by two-thirds.

### Essential Technological Breakthrough

There is growing support worldwide for early action to tackle climate change to stabilize the concentration of greenhouse gases at a level that would prevent dangerous interference with the climate system. At their summit in Heiligendamm in 2007, G-8 leaders pledged to “consider seriously the decisions made by the European Union, Canada and Japan, which include at least a halving of global emissions by 2050.” There is growing support politically for action to limit the average rise in global temperature to around 2 degrees. In the WEO 2007, we estimate that stabilizing the greenhouse gas concentration in the range of 445–490 ppm of CO<sub>2</sub> equivalent would require energy-related CO<sub>2</sub> emissions to be reduced to around 23 gigatons in 2030. This is 19 gigatons less than in the Reference Scenario and 11 gigatons less than in the Alternative Policy Scenario. The above greenhouse gas concentration target is the most ambitious of the scenarios written by the Intergovernmental Panel on Climate Change (IPCC), which would limit the temperature rise to 2–2.4 degrees.

In principle, there are many ways in which energy-related CO<sub>2</sub> emissions could be reduced to 23 gigatons in 2030. We have presented one among a number of possible pathways – which we have called the 450 Stabilization Case – to illustrate the extent of the challenge of achieving this very ambitious target. In this case, global energy-related CO<sub>2</sub> emissions must peak in 2012 at around 30 gigatons and then decline, reaching the goal of 23 gigatons in 2030.

To realize this, the equivalent of 310 gigawatts of coal generation (around 620 coal power plants) would have to be fitted with carbon capture/storage technology by 2030. We would have to build an additional 360 nuclear power plants by 2030 (an increase of 150% on current capacity). Wind generation capacity would have to increase 35-fold by 2030. We would have to improve energy efficiency by 2.7% annually, whereas the current rate of improvement is a mere 1.6%.

Needless to say, such an aggressive target is rather visionary without extreme technological breakthroughs and even a change of our lifestyle. For example, as for technological



IEA chief Tanaka Nobuo (2nd from right) attends a press conference in London in November, briefing reporters on the “World Energy Outlook 2007: China and India Insights.”

breakthroughs, this analysis assumes that key technologies such as carbon capture/storage technology and the next generation of biofuels will be fully commercialized by 2030. Further efforts are needed to accelerate research and development in both the private and public sectors as well as to improve the environment for innovation.

### Determined to Address “3 Renewed Priorities”

The unprecedented economic growth of China and India is transforming the global energy system by their sheer size. The economic development of these two countries is beneficial for the rest of the world as well as their populations. But this growth brings challenges that transcend national borders. For example, it is a challenge for “all” countries to achieve transition to a more secure, lower carbon energy system.

The next 10 years are especially critical because the pace of capacity additions in China and India will be most rapid because of their higher economic growth, and technologies will be “locked-in” for decades once the facilities are built. Growing tightness in oil and gas markets during this decade will also require urgent actions.

As the Executive Director of the IEA, I am making my best efforts to address these three renewed priorities: enhancing engagement with China and India; strengthening the consumer-side approach; and promoting research and development to accelerate technological breakthroughs, working closely with the governments of member countries. **JS**

*Tanaka Nobuo assumed the post of Executive Director of the International Energy Agency on Sept. 1, 2007. After entering the Ministry of International Trade & Industry (now the Ministry of Economy, Trade & Industry) in 1973, he served such posts as minister at the Japanese Embassy in the United States and Director of Science, Technology & Industry at the OECD.*