One Person's View

Prospects for the Global Power Sector: Evolution or Revolution?

In recent years, fresh challenges have been added to an already complex picture in the energy sector. The devastating earthquake and resulting tsunami that struck Japan in March 2011 have disrupted the country's energy sector and had repercussions for energy markets around the world. Economic concerns have shifted the focus of government attention away from energy policy and limited their means of policy intervention. Turmoil in the Middle East and North Africa, which will be crucial to meeting the world's future energy needs, has cast shadows over prospects for adequate and timely oil-sector investment in the region. In addition to these new challenges, there are a few key trends that point in worrying directions. International Energy Agency (IEA) estimates indicate that global carbon dioxide emissions have reached a record high. The energy efficiency of the global economy worsened for the second straight year. And for many countries, spending on oil imports has been at unprecedented levels.

Despite all this uncertainty, one thing is sure: economic growth and rising population are set to generate ever-higher demand for energy. We project global energy demand to rise by 40% between today and 2035. Many large Organisation for Economic Co-operation and Development (OECD) economies, such as the United States and Japan, see very modest energy demand growth over the period. This contrasts with much faster rates of growth in the key emerging economies, such as China and India who collectively represent half of the overall increase. In terms of the power sector, the world's electricity usage is set to grow at almost twice the rate of overall energy consumption, fuelled by rising incomes, continued strong growth in the use of electrical appliances, and switching by households and industry from other forms of energy to electricity for reasons of convenience, efficiency and practicality.

In addition to the challenge of meeting this growing demand, the power sector will have to navigate through a period of major transformation as the generation mix shifts to low-carbon technologies — the result of higher fossil-fuel prices and government policies to enhance energy security and to curb emissions of carbon dioxide.

We project fossil fuels — mainly coal and natural gas — to remain dominant in the power sector, although their share of total generation drops from around 68% today to 55% in 2035, as renewable sources expand. But these projections will not be realised unless governments provide ongoing subsidies as for many regions and technologies, energy derived from renewable sources is, and is projected to remain for decades to come, more costly than from fossil fuels. By facilitating deployment and thereby faster learning, subsidies for renewables can play a key role in improving their future competitiveness. However, in this age of fiscal austerity, it is crucial that adequate attention be given to the design of subsidy schemes to ensure that they are well targeted and their costs do not become too burdensome to taxpayers and consumers. Prospects for nuclear power are now particularly uncertain with some countries announcing plans to reduce its role in the mix while others are looking to increase its use or adopt it for the first time. If those countries considering a reduced role for nuclear power go ahead with this strategy, it could have important implications for their electricity prices, spending on energy imports and efforts to combat climate change.

Almost $17 trillion of investment will be needed in the sector through to 2035 as new power generating capacity of 5,900 GW is added worldwide. Developing countries will account for the larger part of both new capacity and investment. But considerable investment will still be needed in OECD countries, including replacing old infrastructure that is retired. Accommodating more electricity from renewable sources, sometimes in remote locations, will also require additional investment in transmission networks. Financing this in a timely manner will depend on attractive investment conditions, notably in terms of the return available on investment.

As we will highlight in our forthcoming "World Energy Outlook 2012," improving energy efficiency could play a crucial role in easing some of these pressures stemming from the world's ever-rising thirst for electricity. But globally, energy efficiency has been going in the wrong direction since 2009. This is a lost opportunity. I realise that improving energy efficiency is not always easy — good governance capacities are needed to support implementation of energy efficiency strategies, policies and programmes. Institutional arrangements, and particularly public-private sector co-operation and stakeholder engagement, are also key. But progress is possible: Japan's recent energy-savings, or 'Setsuden,' campaign highlighted that even global leaders in energy efficiency can still find ways of making further sustainable improvements. Japan's experience can teach us all very valuable lessons.

(Originally written in November 2012)

Dr. Fatih Birol

Chief Economist
International Energy Agency

Dr. Fatih Birol is the Chief Economist and Director of Global Energy Economics at the International Energy Agency（IEA）in Paris. He is responsible for the IEA's flagship World Energy Outlook publication, which is recognized as the most authoritative source of strategic analysis of global energy markets. He is also the founder and chair of the IEA Energy Business Council, which provides a forum to enhance cooperation between the energy industry and energy policymakers. Dr. Birol has been named by Forbes Magazine among the most powerful people in terms of influence on the world's energy scene.