

Connectivity for Energy Security

Maria Van der Hoeven
Executive Director of the International Energy Agency
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1. Introduction



Ladies and gentlemen, it is a pleasure to be with you once again at Singapore Energy Week.

This event is an opportunity to bring together people from across the globe to discuss some of the most important issues facing our countries, and the world. It is an opportunity for us all to connect.

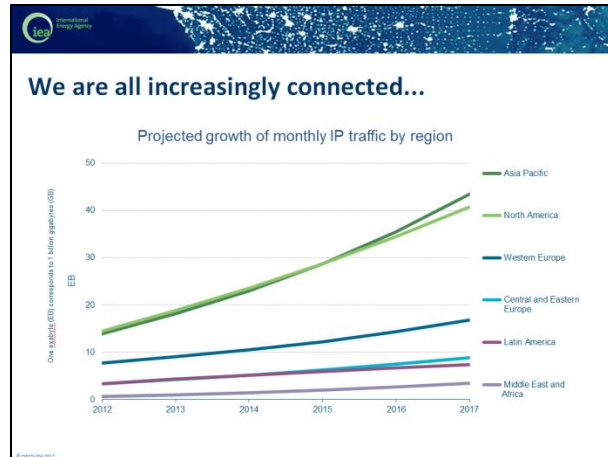
Indeed we are all part of a new world of social and economic connections. The rise of the Internet, advances in transportation, and an increasingly global economy have made this world feel progressively smaller. In many ways, the twenty first century can be defined by how and why we connect.

However such connections come at a price. For every mobile phone that is charged and every intercontinental flight taken, there is energy demand. For every shipment of raw materials, parts, and final products in a global supply chain, there is energy demand. And for every child in an emerging economy who is studying late into the night under the glow of a new electric light, hoping to travel the world and attend university, there is energy demand.

This is not something we can get away from.

While there are more and more options for increasing efficiencies, our global thirst for energy is inevitably going to rise. How we work together to handle that demand will show the true strength of our connections.

2. An Increasingly Connected World



Fortunately we are in a position to share information.

Each of you in this room has a means to connect to almost anyone in the world, instantly. This was unthinkable just one generation ago. From 1990 to 2013, Internet users increased from 3 million all the way to 2.7 billion. Today there are more than 4.3 billion video-enabled devices connected to the internet and this is expected to double to 8.2 billion units by 2017.

Without question, the ability to be connected 24 hours a day, 7 days a week, is revolutionizing our society, and at last count there are over 14 billion network connected devices worldwide.

But this all comes at a cost.

In 2013, network-enabled devices used more than 615 terawatt hours. That's more than the electricity production of Germany.

As economies in emerging markets grow, these demands for connectivity, appliances, transportation, and other hallmarks of modern life will grow in turn. There is no turning back.

Can we reconcile this growth with the financial, social, and environmental costs of energy? Is it possible to increasingly connect our economies and societies, while maintaining energy security and meeting climate goals? Where will the major challenges take place in the coming years?

3. Building Connections in Southeast Asia



Here in Southeast Asia, demand for energy will continue to rise over the foreseeable future. Electricity demand increased by a factor of five between 1990 and 2011, yet it remains low – growth will continue.

Access to electricity varies greatly across the region, from near universal access in Malaysia, Thailand, and here in Singapore, to below 50 percent in Cambodia and Myanmar.

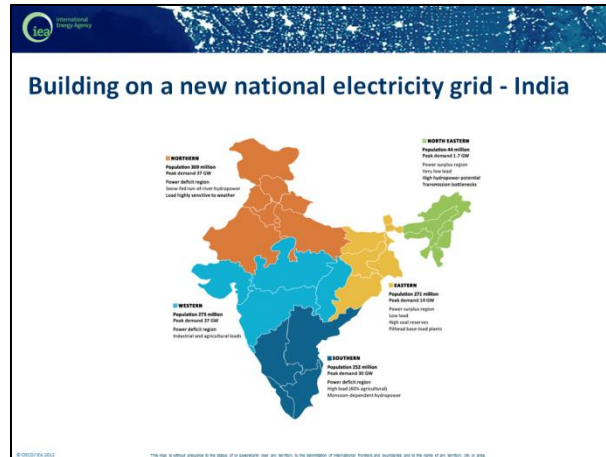
Meeting some of this demand can be made more efficient through realization of the ASEAN Power Grid. The existing interconnections in the Greater Mekong Subregion have a capacity near 4 gigawatts, and plans are in place to develop thirteen new interconnections over the coming decade with transmission capacity of 19 gigawatts.

As I saw firsthand on my recent trip to Laos, Hydro is a significant contributor in the region, and these interconnections can increasingly take advantage of this source of energy. However care must be taken when sharing such a valuable resource. Just as regional cooperation can build interconnections, regional cooperation can help to ensure the sustainable use of water.

Similarly, working together will be key to ensuring that power interconnections form the basis of a transparent and effective open electricity market.

But this is not the only region that faces the challenge of growing demand.

4. The Indian Electricity Grid

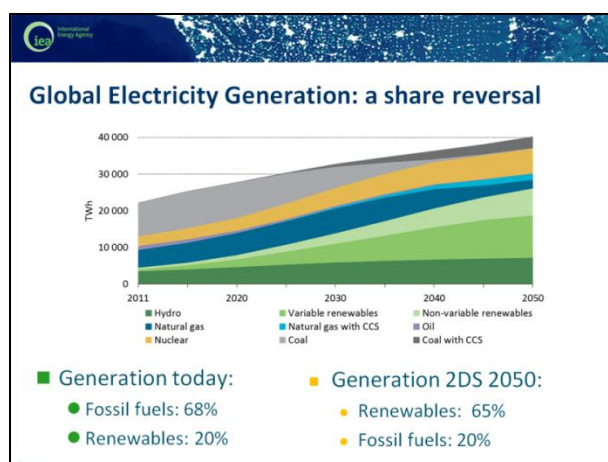


In India, over 200 million people remain without access to electricity, though steps are being taken to build connections and ready the system for this coming demand.

In January 2014, India connected the Southern grid to the other four regions, completing a national grid. Despite remaining challenges with transmission and distribution losses, this is a substantial achievement, facilitating better management of demand and ensuring stability.

On top of this achievement, the potential for cross-border connections with Bhutan, Bangladesh, Myanmar and Sri Lanka represent opportunities for India. However the economic, environmental, and energy security implications of such interconnections depend on the sustainable growth of the domestic system itself, supported by predictable policy.

5. Global Electricity Generation – A Share Reversal



These kinds of strong, interconnected systems will be helpful in diversifying the energy mix.

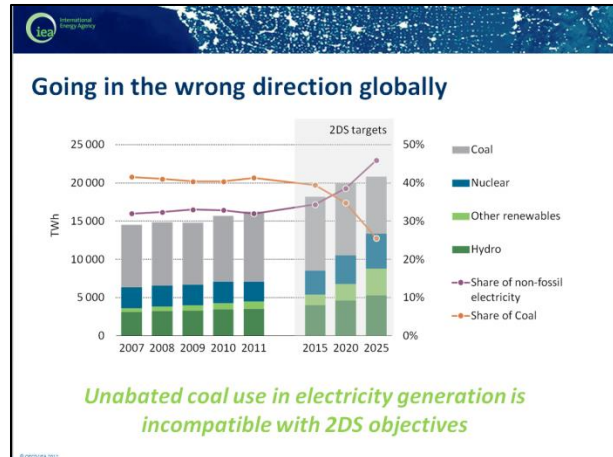
Not only Southeast Asia and India but all emerging economies, with such fast growing demand, will comprise around 70% of new renewable generation to 2020. In China, renewables are forecast to provide 45% of new generation to 2020, ahead of coal. Combined with a rise in nuclear power, low-carbon generation will account for the majority of growth in China over the next five years.

Two thirds of new power generation in China last year came from renewable energy in the form of solar, wind, and hydro. In India, three-quarters of power projects announced over the last three months have been for renewable energy plants.

This shift to renewables is essential if we are to limit average global temperature rise to 2 degrees Celsius, what the IEA refers to as the 2DS scenario. This is an aspirational scenario, it is what the world could look like if we all take serious, concerted action. In fact this scenario would require a share reversal in electricity generation, with renewables making up 65 percent of generation in 2050.

Meeting such a goal requires global commitment, and here in Asia we're seeing real progress. Taking advantage of growing demand and investment opportunities can enable emerging economies and developing countries to avoid the difficult position facing OECD countries today: stagnating demand, and aging infrastructure that makes climate targets seem a distant hope.

6. The Wrong Direction



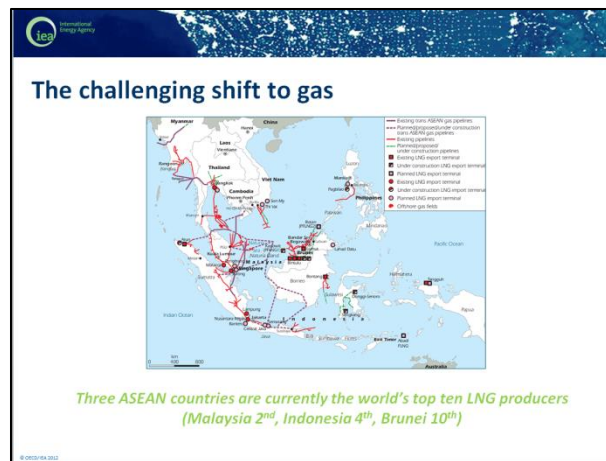
Indeed despite the advances in the deployment of non-fossil generation, globally we're still going in the wrong direction. This is thanks largely to the unrelenting and concurrent rise in unabated coal use in electricity generation.

Since 2010, the growth in generation from coal has been greater than that of all non-fossil sources of power generation combined, continuing a 20-year trend. Even the recent US development of switching from coal to gas has stalled (at least temporarily), and coal use in the European Union rose by 1.5 percent in 2012 over 2011.

The 2DS trajectory requires a sharp decline in coal use in parallel with rapid development of carbon capture and storage, or CCS. Instead, coal is still the dominant energy fuel, and aside from a notable exception in Canada, 2013 saw few major positive developments on CCS.

In all countries – whether they be in Europe, Asia, or elsewhere – it is essential that coal plants use high efficiency, supercritical designs, and that more and more make use of CCS. Meeting global climate goals will simply not be possible otherwise.

7. LNG Trade



Of course we can't talk about energy connectivity and security without talking about gas.

In Southeast Asia, the region's traditional exporters are experiencing declines in domestic gas production that saw Indonesia and Malaysia, the major LNG exporters, turning to LNG imports to cater for their respective domestic demand – a demand that is increasing across the region due to rapid economic growth.

While ASEAN has been supporting interconnection pipelines in the region, due to geographic limitations and the need for political coordination, it is unrealistic to see pipelines developing more rapidly than LNG facilities.

This shift will be challenging.

There is one thing that Asia cannot count on: cheap, abundant gas unleashed by the shale gas revolution. While some North American LNG will cross the Pacific – probably sooner than later – it will not be enough to supply the entire region and it will be expensive.

Asia has two ways to avoid competing at top price for natural gas: find more of it, and use less of it. The good news is that both of these solutions are possible.

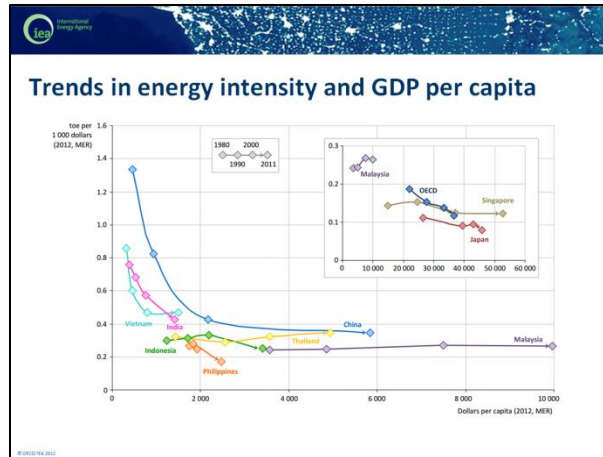
The IEA estimates that the Asia-Pacific region has almost 10 percent of the world's conventional gas reserve. Even before tapping significant unconventional supplies, these conventional reserves are enough to meet more than 40 years of what Asia may need in 2035.

Of course Asia-Pacific is a massive region, and it is not realistic to expect all of that gas to be tapped or used exclusively at home. There is simply no scenario where Asia becomes self-sufficient in gas. However if the region exploits its reserves carefully and takes simple steps to limit growth in energy demand, it can slow the growth of its dependence on imports.

However getting more gas out of the ground will require government policy that creates efficient gas markets across the region.

In terms of using less, this is something that concerns all regions, because the most valuable energy is the energy that isn't used at all.

8. Efficiency



Of course I'm talking about the hidden fuel, energy efficiency.

More and more economies are realizing that energy efficiency isn't a burden, but rather an opportunity – the connection between efficiency and growth is clear. This is the case not simply in established economies, but also in developing and emerging economies across the globe.

Over the last decade, Southeast Asia has matched energy intensity improvements made by OECD countries. Among other factors, this reflects shifts from inefficient traditional fuels to modern fuels, and increased urbanization. However there is room for improvement, as Asia currently consumes more energy per unit of GDP than the OECD average.

The savings from these improvements can be significant.

In fact our most recent *Energy Efficiency Market Report* shows that the savings from energy efficiency improvements and investments in 11 IEA countries, where we have consistent data, were larger than total final consumption in the EU. This means that in 2011, long-term improvements and investments in energy efficiency in IEA countries served to reduce from the global energy system the equivalent of the energy consumption of a major economy.

Along these lines the IEA has been working with regional partners in Southeast Asia to develop a series of recommendations for energy efficiency, ranging from minimum energy performance standards for buildings and appliances, to the establishment of energy efficiency data collection and indicators. We look forward to continuing this conversation.

Without these improvements in efficiency the energy system will be significantly more strained than it is today in providing energy, security and economic opportunities to the global population.

9. Conclusions



The payoff for building these connections is economic growth, energy security, and environmental sustainability – the three E’s of the IEA mandate. However there is a fourth ‘E’ that underscores why we are here today, and that is engagement on a regional and global scale. These four principles should form the basis of a twenty first century energy system.

This twenty first energy system is a system that features global trade, open markets, and regional power grids.

It’s a system that features distributed power generation, both fossil-based and renewable, increased consumer engagement and demand side management, utility-scale storage technologies, electrified transport, and centralized power and heat generation.

It’s a system where all of the elements are integrated to optimize investment and operation. While this increases complexity, the gains in efficiency and resilience are tremendous.

It’s a system that optimizes the use of energy resources.

This is not something that will happen overnight, whether across IEA countries or emerging economies. It will require a continued focus on building connections – connections in terms of infrastructure, markets, and policies. None of this will be easy.

However the benefits from working together and building these connections are significant, and we would be wise to take advantage.