

Sustainability News

NATIONAL AND SECTORAL APPROACHES TO ENERGY EFFICIENCY

Chairman's Message

In 2016, the world would have used 12% more energy had it not been for energy efficiency improvements since 2000 – equivalent to adding another European Union to the global energy market. In emerging economies, energy efficiency gains have limited the increase in energy use associated with economic growth. Without efficiency, total energy use among the member countries of the International Energy Agency (IEA) would still be increasing. Instead, efficiency has led to a peak in total energy use in 2007, and a subsequent fall to levels not seen since the 1990s.



Falling energy intensity is the main factor behind the flattening of global energy-related GHG

emissions since 2014. Lower energy intensity, driven largely by efficiency improvements, is combining with the ongoing shift to renewables and other low-emission fuels to offset the impact of GDP growth on emissions. In addition to the environmental benefits, energy efficiency is bolstering energy security. Efficiency improvements since 2000 avoided additional spending on energy imports in many countries. In Japan, for example, oil imports would have been 20% higher in 2016 and gas imports 23% higher had those efficiency gains not been achieved. In this month's issue, we look at National and Sectoral Approaches to Energy Efficiency, their trends and indicators.

National Approaches

The energy efficiency services market is rapidly developing, with energy efficiency being bought and sold much like a commodity. The markets are more developed in some places, such as China, the United States and the European Union. India's model of an ESCO market that is mainly government driven has developed as well. Furthermore, growing interest in green financial products represents an important opportunity to channel even more funding toward energy efficiency. Policy could play a role in strengthening the promising market through more expansive and more aggressive targets for climate finance, efforts to standardise green bonds, in general, and boosting energy efficiency investments in particular.

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China

In China, ESCOs have been critical not only to achieving energy savings for the economy as a whole but also as a sector of the economy in their own right. In 2015, 5,426 ESCOs exist across the country, some 300 more than in 2014. These ESCOs employed 607,000 people, an 8% increase compared with 2014. Over the previous five years, the number of ESCOs increased sevenfold. Policy is an important driver of this growth as energy intensity improvements are central to China's 11th (2006-10) and 12th (2011-15) five-year plans.

The ESCO model, which China has been developing over two decades, has a prominent place in this strategy and its success has become more widely noted. In 2013, Chinese ESCOs generated annualised energy savings of 17 million tonnes of oil equivalent. The savings from ESCO activities in that year account for approximately one-third of the targeted average annual savings of the 12th FYP. China plans to phase out the national-level subsidy in the coming years. Local municipal

governments, however, continue to provide financial incentives, access and solutions for ESCOs. Various international donors and financial institutions also continue to support development of the Chinese market.

As EPCs favour larger-scale projects, most projects are in the industry sector: 50% by number of projects, 70% by total investment. The buildings sector has been second largest, but a shift is evident with buildings gradually increasing and industry decreasing.

United States

The energy efficiency services market in the United States has grown significantly in the past decade. In 2012, it saved about 34 terawatt-hours of electricity, representing 2.5% of total commercial and institutional electricity consumption. 2 ESCO revenues were an estimated 6.3 billion USD in 2015, more than double the 2.5 billion USD in 2004.

Evidence suggests that policy and funding are as important in shaping the ESCO market as customer demand in itself. The dominant share of the ESCO market (more than 80% of clients and 90% of revenues for ESCOs) is made up of the public and institutional sector (Stuart et al., 2014) (Figure 6.4). This can partly be explained by strong federal policy and funding.

The American Reinvestment and Recovery Act, which entered into force in 2009, provided financial support for energy efficiency measures in public facilities. While this financing did not have to be channelled through ESCOs, the ESCO business model benefited. In 2011, the presidential memorandum "Implementation of Energy Savings Projects and Performance-Based Contracting for Energy Savings" earmarked a minimum of USD 2 billion in EPCs for federal buildings and was focused on the ESCO business model.



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Without efficiency improvements since 2000, the world would have used 12% more energy than it did in 2016.

Energy Efficiency Trends and Indicators

Global energy intensity – primary energy demand per unit of gross domestic product (GDP) – fell by 1.8% in 2016. Since 2010, intensity has declined at an average rate of 2.1% per year, which is a significant increase from the average rate of 1.3% between 1970 and 2010. The rate of intensity improvement varies widely across countries and regions; energy intensity improved faster in China than in other major economies. Without China, global energy intensity would have improved by only 1.1% in 2016.

The fall in global energy intensity means that the world is able to produce more GDP for each unit of energy consumed – an energy productivity bonus. This bonus was USD 2.2 trillion in 2016 – equal to twice the size of the Australian economy. Owing to its big fall in intensity and the sheer size of its economy, China accounted for half of this bonus, with the United States contributing another quarter. Falling energy intensity is the main factor behind the flattening of global energy-related greenhouse gas (GHG) emissions since 2014, offsetting three-quarters of the impact of GDP growth. An increase in the share of renewable energy and other low-emission fuels was responsible for offsetting the other quarter.

Without efficiency improvements since 2000, the world would have used 12% more energy than it did in 2016 – equivalent to adding another European Union to the global energy market. Improvements in energy efficiency are the biggest contributor to reduced energy use and emissions, more than double the impact of the shift in economic activity towards less energy-intensive sectors. In emerging economies, energy efficiency gains have limited the increase in energy use associated with rapid economic growth. Without efficiency, total energy use among the member countries of the International Energy Agency (IEA) would still be increasing. Instead, efficiency has led to a peak in total energy use in 2007, and a subsequent fall to levels not seen since the 1990s.

Energy efficiency has made a big contribution to strengthening energy security. Efficiency improvements since 2000 avoided additional spending on energy imports in many countries. In Japan, for example, oil imports would have been 20% higher in 2016 and gas imports 23% higher had those efficiency gains not been achieved. In the United Kingdom and France, energy efficiency gains contributed to reducing the daily supply capacity needed to maintain current levels of short-term gas security.

IEA MEMBER COUNTRIES

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In Japan, efficiency gains in 2016 achieved a 20% saving in oil imports and a 23% saving in gas imports.



Falling energy intensity has flattened global energy-related greenhouse gas emissions since 2014, offsetting 3/4 of the impact of GDP growth.

Power Sector

Energy efficiency of thermal power generation has improved by 0.9% since 2000 at world level reaching an average value of 36.5% in 2014. This is far below the OECD Asia or North America average (both above 40%) or world best practice: Spain with 45% due to a high penetration of CCGT, combined cycle gas turbines (Figure 17). The greatest improvements can be seen in China with the commissioning of new efficient coal plants, as well as in North and Latin America with the spread of CCGT.

At world level, CCGT represent 19% of the installed thermal power generation capacity, a rise of 10% since 2000 (reaching 34% in Europe and over 30% in Latin America).

