

# Interview

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with **Fatih Birol**,  
*IEA Executive Director*

**As we have seen in submissions to COP21, energy efficiency is at the top of the agenda for a large number of countries. In Italy, within our 2013 National Energy Strategy, energy efficiency is among the seven top priorities with ambitious 2020 targets. But this is the result of a long process: when did energy efficiency become so important at the international level?**

The 1973 oil crisis had a fundamental impact on the global energy system. Primarily, it focused attention on the critical importance of energy security and ultimately resulted in the formation of the International Energy Agency (IEA). It also drew attention to the issue of energy efficiency, which had until then been seen as more or less an engineering issue. In the four decades since the crisis, what was once the “hidden fuel” has increasingly been recognized as the “first fuel”.

Indeed with each passing decade, the importance of energy efficiency in energy policy has increased, and today there can be no discussion on energy systems without invoking efficiency. The IEA is today a central voice in this debate, and with each passing year the Agency increasingly focuses on the importance of energy efficiency and the ways in which it intersects with the rest of the energy mix. Since 2012 the IEA's World Energy Outlook (WEO) has featured a chapter on energy efficiency on equal footing with other fuels. In 2013, the IEA added energy efficiency to its suite of fuel market reports. Alongside traditional fuels such as coal and oil, the IEA now publishes an annual Energy Efficiency Market Report, and also regularly tracks a set of energy efficiency indicators. Embracing energy efficiency is a natural and inevitable extension of the central mandate of the

IEA – working to ensure reliable, affordable and clean energy for its member countries and beyond. Being no longer seen as a technical, engineering issue, energy efficiency now lies at the nexus of the three central energy policy challenges: energy security, sustainability and economic development.

At the IEA Ministerial Meeting in November 2015, our member countries supported an even further increase in our focus on energy efficiency. Today, we are positioning the IEA to become a global hub for sustainable technology and energy efficiency, and in January 2016 we created a dedicated energy efficiency division within the Secretariat. This comes at the same time as we have opened our doors to a wider set of members – China, Indonesia and Thailand are now Associate members of the IEA – and energy efficiency will be critical to their developing moving forward.

**It is widely recognised that energy efficiency has multiple benefits, an important one being energy security. This is particularly important for countries like Italy with marginal production of fossil fuels and high energy dependency, currently equal to 74% and expected to remain around 67% even with the successful implementation of the National Energy Strategy.**

The traditional definition of energy security – ensuring the uninterrupted supply of energy sources at an affordable price – does not mention energy efficiency, but it is implied. This is simply because the less energy we use, the less we need to either produce or import.

A very real and tangible example can be seen in the transport sector. A far cry from 1974, today

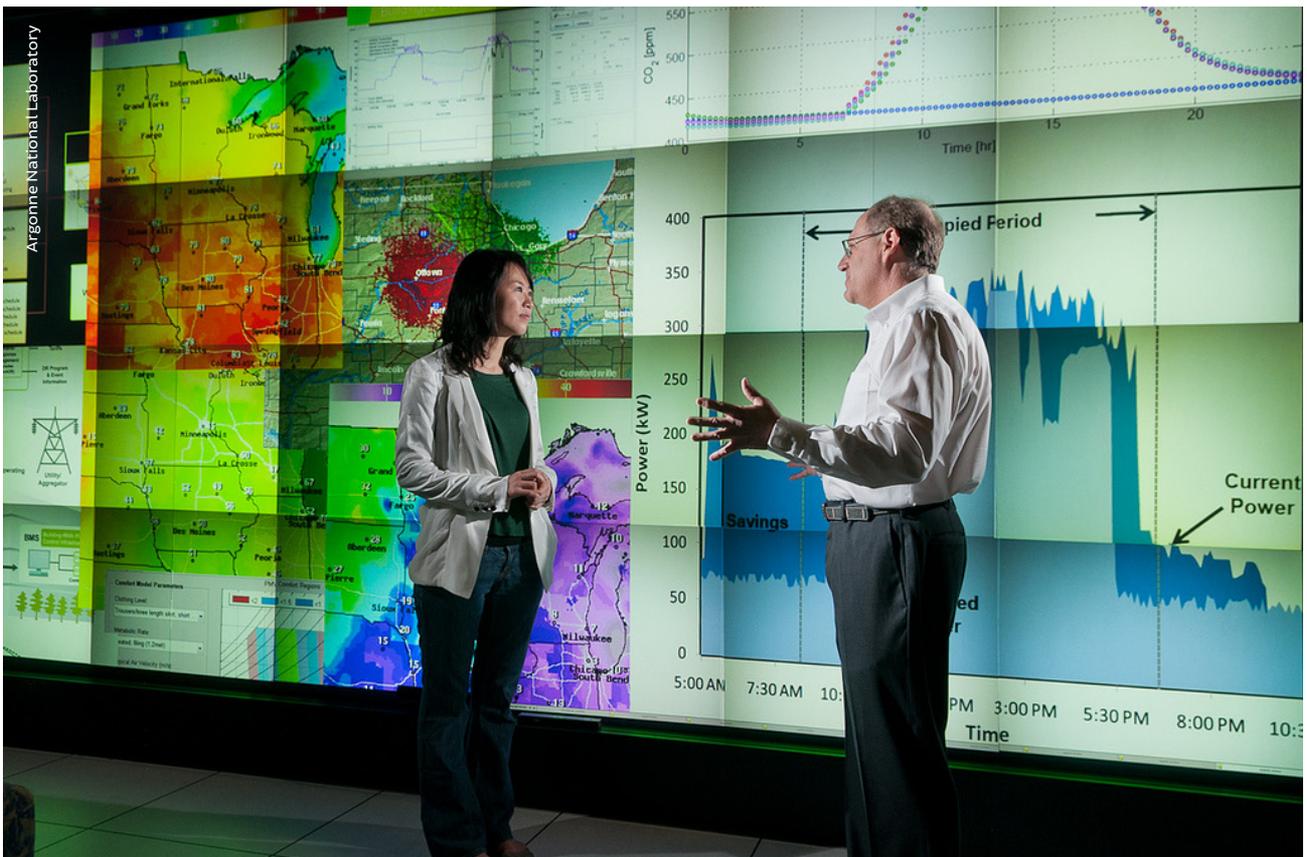
fuel economy standards for internal combustion engines are in place in most OECD countries and are delivering significant fuel savings. These fuel savings result not only in reduced bills at the pump for consumers, but also substantial decreases in fuel-import expenditures. In the WEO 2014, it is estimated that energy efficiency policies currently under discussion in the EU could cut fuel-import bills by almost a third, a result made possible in part by more efficient vehicles.

Consider that, according to the IEA's Tracking Progress on Clean Energy Technologies, sales for alternative vehicles have set new records and market shares for hybrid, plug-in hybrid and battery electric vehicles all grew in 2014. China in particular is supporting these technologies: 230 million electric 2-wheelers are already on the road in China alone, while the total stock outside China

is approximately 5 million. Meanwhile out of the 46,000 electric buses worldwide, 36,500 of them are in China.

### How do recent price trends influence the link between energy efficiency and energy security?

Today is a time of low energy prices. Oil is plentiful, renewables are increasingly competitive, gas is more affordable, and coal is cheap. One would think that if such a period of low energy prices were to continue, it would result in neglect of action to promote energy efficiency, and ultimately the return of greater consumption. Preliminary estimates indicate that this has not happened. Global energy intensity, measured as the amount of energy required to produce a unit of GDP, decreased by 2.3% in 2015 relative to the previous year. This is more than double the average



rate of change over the last decade. A major drive of this global change was a sharp reduction in energy intensity in China.

**Italy, particularly at local levels, is increasingly focusing on decarbonisation initiatives, as witnessed by the large participation to the Covenant of Mayors: more than 3000 Sustainable Energy Action Plans have been signed in our country out of a total of 6521. What about another central benefit of energy efficiency, namely environmental sustainability?**

Preliminary IEA data show that energy-related CO<sub>2</sub> emissions stalled, in 2015, at a total of 32 gigatonnes, unchanged from the previous year. This happened even as the world economy grew. In fact, across the OECD, emissions fell while the economy continued to grow. This change, a hint of the ultimate goal of decoupling emissions from economic growth, reflects both increased deployment of renewables and enhanced efforts to increase energy efficiency. However, this is not enough. As the WEO Special Report on Energy and Climate shows us, increased efforts are absolutely necessary if the world is to meet its collective climate target. Naturally, energy efficiency is the first on a list of five measures that make up the IEA Bridge Scenario, a scenario that could deliver a peak in global energy-related emissions by 2020. In this scenario, energy efficiency is responsible for nearly half of global GHG abatement in 2030.

However, the adoption of these measures does much more than reduce emissions, offering a wide range of benefits, well beyond their contribution to climate policies. These benefits include increases in disposable income and improved industrial productivity (with positive effects for economic growth), improved local air quality (with associated health benefits) and increased energy access.

**Technological development can significantly increase the range of available energy efficiency options, reducing the cost of objectives achievement: looking at future challenges, high performance and efficient technologies will be more and more needed. Which would be energy efficiency key developments at sectoral level?**

If we look at the IEA Bridge Scenario, we see a wide range of standards being implemented that help us

get on track for our climate goals. In the industry sector, for instance, minimum energy performance standards (MEPS) are introduced for electric motor systems, and the adoption of variable speed drives is made mandatory where applicable. Incentives are introduced for heat pumps that provide low-temperature heat, and mandatory audit programmes raise awareness, particularly in industries where the largest potential remains, including food, textile, paper and chemicals.

In the buildings sector, MEPS support a phase-out of the least efficient categories of selected refrigeration and cleaning appliances by 2030. A phase-out of the least efficient category of televisions and computers is accomplished by 2030. A ban on incandescent light bulbs in residential and commercial buildings is introduced by 2020 and on halogen light bulbs by 2030. For heating and cooling, MEPS are set for new equipment, and technology changes made. For new buildings, an increase in insulation levels is applied as a step towards near-zero-energy buildings. Finally in the transport sector, fuel-economy standards are imposed in every country for new light duty vehicle sales, so that the global average fuel consumption for these new vehicles is reduced to around 4 litres per 100 km in 2030, i.e. a reduction of 50% relative to 2005. For new freight trucks, standards are adopted to achieve a 30% reduction in average vehicle fuel consumption per truck relative to today.

**Now let's focus on the positive implications of energy efficiency in economic terms. In Italy, in the 2007-2014 period tax deductions for energy efficiency interventions created 271,000 new jobs directly and 406,000 overall. Moreover, according to survey results, one third of energy utilities are planning to increase energy efficiency investments in the coming years. At the global level, it is interesting to look at the overall economic value of energy saving.**

Just as energy efficiency can reduce demand, in terms of economic development, efficiency can reduce costs, both directly and indirectly. As our 2015 Energy Efficiency Market Report tells us, energy efficiency improvements over the last 25 years have saved a cumulative USD 5.7 trillion in avoided energy expenditures.

Where are these savings coming from? At its most fundamental, the impact of energy efficiency on



macroeconomic variables can be measured through GDP, employment, trade balances and energy prices. Zooming in further, public budget impacts are closely linked to macroeconomic impacts such as reduced government expenditure on energy, increased tax revenues through greater economic activity, or reduced unemployment payments. Utilities and other energy providers gain in a variety of ways from energy efficiency measures, both directly, from lower costs for energy generation, transmission and distribution, and improved system reliability, and indirectly, from improved affordability of energy services. At the level of business, industrial energy efficiency measures enhance competitiveness and profitability, improve the working environment and reduce costs for operation and maintenance, and for environmental compliance. At a more personal level, energy efficiency improvements in buildings contribute to occupants' health and well-being, particularly among vulnerable groups such as children or the elderly.

**Widely accessible and transparent information is needed in order to involve the highest number of actors and have proactive consumers. For example, although in Italy almost 90% of financial institutions propose specific products for energy efficiency interventions, the adoption of “traditional” loans prevails. This suggests that the peculiarities of energy efficiency are still to be recognized, since the credit worthiness remains the main granting criterion. Yet, the growth margin for the Italian energy efficiency market seems to be high. At the international level, does the investment market development reflect the key strategic role of energy efficiency for economic development?**

Under existing policies the vast majority of economically viable investments will not be made. There continues to be a lack of attention paid to energy efficiency investment opportunities both by public and private stakeholders relative to supply-side



opportunities, including new resources such as shale gas and oil.

This is unfortunate, as from a market perspective, energy efficiency services are a commodity – for all types of energy consumers and producers – and should now stand on an equal footing with any other energy resource. In fact in 2012, aggregate annual investments in energy efficiency reached more than USD 310 billion. This was larger than supply-side investment in renewable electricity or even in coal, oil and gas power generation.

There is a market opportunity here. In fact, about 40% of energy efficiency investment worldwide is financed with debt and equity and the finance market is moving from being a niche to a more established market segment.

This is in part a result of the availability of a greater range of financial products and new business models, such as green bonds and Energy Performance Contracts involving a growing number of energy service companies (ESCOs).

ESCO markets in European countries are at diverse

stages of development. Good market growth has taken place in Italy over the past ten years thanks to a more favourable legislative framework focused on refurbishment of public buildings, financial incentives for refurbishment and modernisation of private buildings, and stronger environmental awareness. Nevertheless, of some 150 Italian ESCOs identified, only half of them have the technical and financial capacity to provide long-term performance contracts.

To take a specific example, in the transport sector, by 2020 an estimated USD 80 billion annually is expected to be spent on energy efficiency in passenger vehicles. Indeed, over the next ten years investment in this area is expected to represent over 60% of all incremental investment in energy efficient technologies worldwide, resulting in significant fuel savings.

**Country-level experience has shown that policy-making plays a fundamental role in creating an attractive environment for knowledge,**

**research and development, and in supporting those actors that are committed to “creating” innovation. Thus, well-structured technological development policies are key to any strategy aimed at stimulating more investments in energy efficiency technologies. What is the role envisaged for policy-makers in future market development?**

Signals are pointing to continued interest in expanding and financing this market. To continue to exploit this resource we need policies to enhance technological improvement and exploration of new opportunities, and to increase transparency and clarity for market actors on the returns they can expect.

Like oil and gas wells or power plants, these investments satisfy energy service demand over their lifetime. Those avoided joules of consumption are increasing energy security, improving fiscal balances and achieving important environmental benefits for years to come. While the benefits of efficiency provide ample appeal for market actors and policy-makers to expand its role and reach, it is the urgency of the problem that compels us to act.

**In conclusion, what are the key messages and challenges identified by the IEA for the next future?**

First, we face the key challenge of combating climate change while increasing the sustainability of the energy sector and maintaining, or strengthening, economic growth. This will not be achieved without energy efficiency.

Second, the virtual supply of energy saved from efficiency generates multiple benefits to governments, businesses and households, providing at the same time a market opportunity for a wide range of sectors. Last, over the past forty years, the importance of energy efficiency has risen consistently, from being considered as an engineering issue to now being considered as the first fuel and recognized as a central and critical component of the global energy transition. The next step will require leadership and investment, necessary for energy efficiency to realize its potential and help the world meet its collective climate goals.

**Thank you very much Dr Birol. Communication plays a key role in spreading the culture of energy efficiency and I am sure that the efforts of the IEA will help raise awareness of all stakeholders involved in our common global climate challenge.**