Ladies and Gentlemen, it is a great pleasure for me to be here at the World Energy Congress. It is a prime opportunity to launch the latest in our annual Market Report series – the IEA’s inaugural Energy Efficiency Market Report.

Energy efficiency lies at the nexus of the 3 overlapping challenges that confront the world in terms of energy policy – energy security, sustainability, and economic development. I participated earlier in a panel on this “energy trilemma”.

Well, IEA analysis consistently identifies energy efficiency as the major contributor to potential cuts to carbon emissions, reductions in local pollution, and cost-effective energy security.

Simply put, the cleanest megawatt hour will be the one we never need, and the most secure barrel of oil the one we never burn. It is also often the cheapest, and the easiest to achieve in difficult conditions.

But energy efficiency opportunities really make up an interlinked constellation – between transport, industry, buildings, and the like. And understanding that constellation as a market, is a relatively new undertaking.

For many years, commentators, including the IEA, have struggled to clearly grasp what energy efficiency is. We are not the only ones to call it “the hidden fuel”.

We are taking a new perspective to energy efficiency with this report; treating it as we would any other energy resource. Indeed, it joins our Market Report series along-side more traditional conceptions of fuel sources: oil, gas, coal, and renewables.

So in that vein, we are asking the important questions:

- how big is energy efficiency? – what does it contribute to the global energy system?
- what scale of investment drives energy efficiency? and what return do we get on that investment?
- what do practical investments in energy efficiency look like; what services and products are delivered by energy efficiency market players?

Energy efficiency markets deliver goods and services that reduce the energy required to fuel our economies. That provides a fundamental conception and definition of efficiency markets to drive our analysis.

Like many markets, the market for energy efficiency is as diffuse as consumption patterns themselves. And there is clearly a demand side and supply side. Some actors demand more efficient provision of energy services, and suppliers provide the necessary goods and know-how to deliver it.

Consumers cover a wide spectrum, from individuals to businesses to governments, and market activities cover all energy-consuming sectors of the economy.
This inaugural Energy Efficiency Market Report summarises the trends and prospects for investment and energy cost savings in the medium term, up to 2020, by looking at energy efficiency through three lenses:

• First, by treating energy efficiency as we might treat a supply option e.g. – we ask how much energy efficiency is consumed, what does it cost, what do we get out of it...
• Second, we draw on bottom-up analysis of investments and outcomes from energy efficiency, rather than top-down modeling or scenarios
• And third, we work with a short-term focus – to see what is driving the current market, what is happening now, and what the prospects look like in the near term
As our inaugural regular report devoted to energy efficiency, the Energy Efficiency Market Report complements IEA World Energy Outlook analysis. This puts energy efficiency into a global, long term context – and is exemplified by WEO 2012 analysis which developed a special Efficient World Scenario to 2035.

This Market Report also complements our even longer-term work in the Energy Technology Perspectives series to 2050, as well as the more prescriptive 25 Energy Efficiency Policy Recommendations and Policy pathway series.

It develops a consistent approach to understanding energy efficiency trends and prospects by integrating:

- Up to date analysis of energy indicators from the 2013 update of IEA country data,
- Recent trends in energy productivity and per capita consumption;
- Changes in sectoral and physical energy use – for example how growth in residential energy use is offset by identifiable energy efficiency policies;
- And it starts a process of expressing energy efficiency in monetised terms – the value of energy efficiency investments, avoided energy demand, and other co-benefits expressed in dollars.

Importantly it shows from the range of case studies reported, how the economic potential for energy efficiency shown in this WEO slide is being developed globally through practical examples of actions by many market players, and enabled by pragmatic government policies.

Let me now turn the floor over to Didier Houssin, whose Directorate led this work and who will present more in detail the key points in this publication.
We estimate that investment into energy efficiency markets worldwide totalled up to USD 300 billion in 2011.

This is similar in magnitude to supply-side investment in renewable or fossil fuel electricity generation.

However, investments in energy efficiency are still less than two-thirds of the level of fossil fuel subsidies – which encourage wasteful and inefficient consumption.

Investment in energy efficiency is distributed unevenly across countries and energy-consuming sectors (buildings, domestic appliances, transport and industry).

The estimate provided is considered conservative because, first, limited information on private-sector investment means it relies primarily on public-sector investment information, and second, the energy efficiency components of investment are frequently not discernable from business-as-usual infrastructure and consumer investment.

Is this a mature market? Are the investments sufficient to sustain a market that can deliver the potential of energy efficiency?

We offer 4 answers to this:

1. The world doesn’t fully understand the outcomes that energy efficiency delivers. In this report you will find examples of monetised health benefits from insulation installed in older homes. The market players that deliver these services don’t reap the health benefits directly, but families and government health budgets are getting a far greater return than the value of their “saved” energy. The IEA is advancing this with its programme of work on the multiple benefits of energy efficiency.

2. There are gaps and sub-optimal investments: in different markets different products take off while others lag behind. Rarely do we take a integrated approach to energy efficiency investments – there are few one-stop shops for integrated solutions, gaps remain. There is a need for better policy design to ensure that markets are understood, enabled and encouraged.

3. Globally there is huge diversity in energy efficiency market maturity – the UNSE4All process highlights regional gaps, but we also see countries like the US and Chinese utility and ESCO markets developing well.

4. Many analyses of potentials underestimate the costs of initiating market capabilities, the transactions cost of interventions.

We clearly have much work to do before we can claim that the markets for energy efficiency are sustainable.
As the ED mentioned, the energy savings from efficiency measures exceed the output from any other single fuel source in a sub-set of 11 IEA countries in 2010. Energy efficiency investment has already delivered significant reductions in energy demand.

_Over the long term_, just as the world has developed its supply-side energy assets; (oil platforms, pipelines, power stations) over the past 40-50 years, (the average age of oil and gas assets is 25-30 years) it has also been investing in energy efficiency. Our data goes back to the oil shocks in the seventies and we can see the build up in energy efficiency (the orange wedge) back to that time.

Energy efficiency investments made since 1973 have had a major cumulative impact, resulting in avoided energy consumption of 32 billion tonnes of oil equivalent in 11 IEA countries over the years.

_From a medium term perspective, since 2005_, cumulative avoided energy consumption of 570 million tonnes of oil equivalent (Mtoe) over the five years to 2010. This amount of avoided energy is _greater than oil used in the United States’ transport sector in 2010_ (554 Mtoe). In monetary terms, 570 Mtoe of crude oil would be valued at _USD 420 billion_ (at a price of USD 100 per barrel).

Despite these measures being taken only relatively recently, they have already had a _significant impact on total final energy consumption_. It is useful now to look at 2010 the latest year with complete data.

**NOTE**: Those for which sufficient data is available to undertake such analysis: Australia, Denmark, Finland, France, Germany, Italy, Japan, the Netherlands, Sweden, the United Kingdom and the United States.
In 2010, energy efficiency investments made since 1973 have had a major cumulative impact on annual energy use, resulting in avoided energy consumption of 63 exajoules (EJ) or 1500 mtoe in these 11 IEA countries.

This amount was larger than the consumption of oil (43 EJ), electricity or natural gas (22 EJ each) in these countries in 2010 alone. This reflects the development of energy efficiency market investments over several decades, and the continued delivery of energy savings from these investments, net of any rebound effect.

The size and duration of energy savings are affected by various factors, including the lifetime of the investment, and the extent to which disposable income generated from avoided energy consumption is spent on additional energy services (the rebound effect).
Final energy use (measured in terms of Total Final Consumption (TFC) and shown in the blue bar) for a group of 15 IEA countries, increased by 0.5% per year over the entire period 1990 to 2010, (the graph on the right side) but fell between 2000 and 2010 (the graph in the middle).

The IEA decomposition analysis identifies the different factors that drive changes in energy consumption:

1. **Activity**: that is energy due to changes in activity or output within a sector or sub-sector (the orange bars)
2. **Structure**: (the mix of activities within a sector / changes in the relative shares of the industrial sub-sectors, transport modes or types of residential end-use) (the pink bars)
3. **Actual energy efficiency improvements** (the red bars)

Energy efficiency has been the key factor restraining the growth in energy consumption that would otherwise have resulted from increased economic activity.

The efficiency effect is larger than the effect of structural changes, which have also contributed to a decline in final energy consumption over the past decade.
The relative contribution of structure and efficiency to the overall trend varies among countries, driven by contrasting economic performance over the period and also by varying impact of the recent global recession.

Different national trends also need to be understood in relation to the country-specific starting-points in 1990.

• Some countries had high levels of aggregate energy intensity in 1990 and thus more room to improve efficiency.
• Some have had long-term energy efficiency policies in place since before 1990, and started from lower intensities.
• Some countries experienced structural changes, such as the expansion of their services sector or a drop in industrial activity.

But overall in most IEA countries, energy efficiency has contributed over half the aggregate improvements in energy productivity.
Two-thirds of the report is a series of case studies on key **energy efficiency markets in 15 countries or regions**. *(Australia, Canada, China, the European Union, France, Germany, India, Japan, Korea, Mexico, New Zealand, South Africa, South-east Asia, the United Kingdom, and the USA)* including **5 which are not members of the IEA** : China, India, Mexico, South Africa and South East Asia.

The case study approach is valuable because: energy efficiency markets are typically **shaped by local consumer energy prices and policies** and energy efficiency outcomes are often only measurable at end use level.

Some examples from the case studies of key markets for energy efficiency include:

**The expanding role of Utility and Energy Service Companies (ESCOs)**
- ESCOs are now active in close to 50 countries globally.
  - In the United States, for example, levels of spending on ratepayer-funded efficiency programmes have grown from USD 1 billion in 2000 to USD 7 billion in 2011, an average annual growth rate of 20%.

**In the industrial sector,**
- In Australia, government programmes led industry to make net annualised financial savings of USD 283 million in 2010/11, based on investments made from 2006 onwards.
- The voluntary Canadian Industry Program for Energy Conservation supports process integration studies in industrial facilities, which led to annual energy savings worth USD 54 million in 2012.

**And in emerging economies**: Limiting the growth in demand for energy, especially imported sources of energy, is an important tool for meeting growing demand for energy services while limiting public expenditure and meeting other environmental objectives.

In China:
- **11th Five Year Plan** led to a reduction in energy intensity of over 19%. It also stimulated rapid growth in local energy efficiency services markets.
- the market value of ESCOs increased from USD 694 000 in 2005 to USD 12 billion by 2010;
A spotlight on appliance technologies and the potential of the ICT sector

The key growth area in appliances is in information and communications technologies or ICT. In turn this creates strong growth potential for energy efficient appliances and equipment.

The ICT sector presents both important opportunities and challenges for energy efficiency. Networked products provide a good example. The rapid introduction of networked products and services, such as “smart” appliances, will enable a wide range of innovative energy management systems to proliferate and improve efficiency through greater consumer control and price-responsiveness.

However, uptake of networked products and services is also driving up aggregate energy demand and the opportunity for these products to power down to energy-saving modes is limited by their constant connection to the network.

The amount of excess energy used due to the inability of network equipment to go into a standby mode, could reach 550 terawatt hours (TWh) as early as 2020, greater than the annual consumption of electricity in Canada.

There also remains room to improve the energy efficiency of products in the “traditional” appliance market. For example, raising the efficiency of products sold in some of the world’s major markets to global best levels, and using other policy levers to sustain improvements, could reduce electricity demand by 1 800 TWh in 2030 (about two-thirds of 2010 electricity consumption in the European Union).
During the development of the chapter on Japan we found a particularly useful piece of analysis on the Top Runner programme.

This straightforward portrayal of the investments made by industry to produce higher efficiency products, and the benefits or returns to consumers, is at the heart of what we are trying to understand and encourage with this report.

We think that the “monetisation” of Top Runner inputs and outcomes cuts through to the essence of the programme and neatly explains the effort made by industry and the benefits to society.

Top runner is expected to deliver USD 3 billion in consumer benefits for lighting, vehicles and appliances

The commitment to broaden its scope to cover three-phase induction motors, LEDs, heat pumps and printers in 2015 is a sound move and a practical next step for the programme.

For many years now citizens all over the world have enjoyed the improved energy efficiency from improvements motivated by this programme – spread internationally by Japanese companies.
There is also a vast effort underway in Korea on energy efficiency.

But three energy efficiency markets stood out and grabbed our attention.

The **Energy Service Company or ESCo industry is growing rapidly**. Korean ESCOs reached USD 330 million investment in 2011, an increase of 63% from 2010. Rapid growth by any measure – perhaps one of the fastest growing markets for energy efficiency in the world. This market delivered avoided energy equivalent to 1.3 Mtoe in 2011.

The total number of **high-efficiency products is increasing very fast in Korea’s appliance markets**. Korea has for a number of years been a leader in appliance and equipment energy efficiency. Anyone working in energy efficiency standardisation (MEPS and labelling) processes will be familiar with Korea’s efforts. But increasingly we are seeing innovative advances in Korean appliances, driven by Korea’s domestic energy efficiency policies, flow on to global markets. (In 2012 Korea had 43% or the global market for televisions, 18% for refrigerators, and clothes washers, 11% for air conditioners. We see Korean products driving global markets to higher levels of energy efficiency.)

**Fuel-efficient vehicles are accelerating rapidly in Korea**. The graph on this slide shows the rapid acceleration to higher efficiency vehicles in the Korean vehicle market over the past 5 years. This will continue as government policies accelerate the vehicle industry from 30% to 100% compliance with 17 km/l (5.9l/100km) by 2015.
The IEA concludes that:

**Energy efficiency markets are expected to grow in all the regions examined in this report.**

Growth will be principally driven by price and policy.

Much of that growth is anticipated to come from private investment enabled by government policy rather than direct public investment.

Many examples from the cases considered in this report illustrate the extent of growth prospects. It is also striking to see the growing number of countries designing and implementing ambitious Energy Efficiency Policies in most regions.

**Energy Efficiency is a critical resource** because

- Energy prices show no sign of letting up
- There is a large potential still to be tapped by this growing market

**To capture this and advance energy efficiency markets we need to improve energy efficiency data** to better capture the expansion of market activity and **make better policies faster**.

The energy efficiency market is growing in stature and maturity, but it is developing more rapidly than the ability to properly evaluate and understand it. A particular priority is to improve our capability to measure the size, nature and impact of energy efficiency markets and the outcomes from investments made in them. Stakeholders must address the urgent need for better data to support stronger systems of measurement.

Let me now turn this over to the Executive Director who will conclude by underlining the key messages to be taken away from this report.
I’d like to mention just a few of the important highlights from this publication.

First – the pure size. We estimate that investment into energy efficiency markets worldwide totalled up to USD 300 billion in 2011.

This is similar in magnitude to supply-side investment in renewable or fossil fuel electricity generation.

Second, why do we refer to Energy Efficiency as the First Fuel? It is because the contribution of efficiency to growing world “demand” or “needs” is enormous. Indeed, in 2010 the energy savings from efficiency measures exceeded the output from any other single fuel source in a sub-set of 11 IEA countries.

Third, the recent growth of this market has been driven by 2 major factors – effective policy, and the increasing price of energy. Policies like energy standards, labelling, access to assessments and financing, and obligations on suppliers have proved crucial – but they need to be honed to maximize efficiency benefits and minimize economic impact. And of course the high price of oil in particular, as well as price volatility, has had a major impact on transport efficiency – but also in other sectors as well. By the same token however, the absence of dynamic price signaling in energy markets – say from subsidies, high transaction costs, information failure, or lack of institutional capacity – can seriously impede efficiency improvements.

Fourth – countries are taking energy efficiency seriously, judging from their stated policy goals. Here in South Korea, the market for fuel-efficient vehicles is accelerating rapidly. I applaud the requirement that suppliers shift from 30% to 100% compliance with a fuel efficiency standard of 17 kilometres per litre of fuel by 2015. It is truly an impressive and ambitious move. At the same time, pledges on Chinese energy intensity, American appliance standards, and French buildings and transport standards are just a few heartening examples outlined in this report.

Fifth – There is also an impact from energy efficiency on the wider economy in terms of: Job creation, labour value and labour quality. This remains a difficult area for analysis in energy efficiency as in other sectors. But we note some credible examples from countries:

• The UK Green Deal has been estimated to deliver 65,000 additional jobs by 2015.
• In 2010, the United States energy and resource efficiency sector was estimated to employ 830,000 people. In the buildings sector alone it is estimated to deliver 380,000 jobs by 2020.

Compared to some other areas of the energy industry, efficiency measures, especially in the buildings sector, are relatively labour-intensive. The associated jobs are often local jobs in SMEs for the provision of services and typically utilise spare labour capacity.

And finally, looking to the future, the potential savings from efficiency are huge. Simply by adopting known best technologies, the “Efficient World” WEO scenario to 2035 shows that ... Global energy demand can be cut by half compared to the baseline scenario, fuel bills are cut by 20% on average; and the global economy is boosted by a cumulative USD 18 trillion to 2035. But we need to develop these markets now to better tap this huge potential.

Seen in these terms, the data shows efficiency not just to be a “hidden fuel”, but actually the “first fuel” now and going forward and I do hope that this first Energy Efficiency Market Report will help policymakers but also other stakeholders including the business and financial community to better realize how these markets are growing now and should grow even faster in the coming years.

Thank you for your attention.