Energy Efficiency 2017

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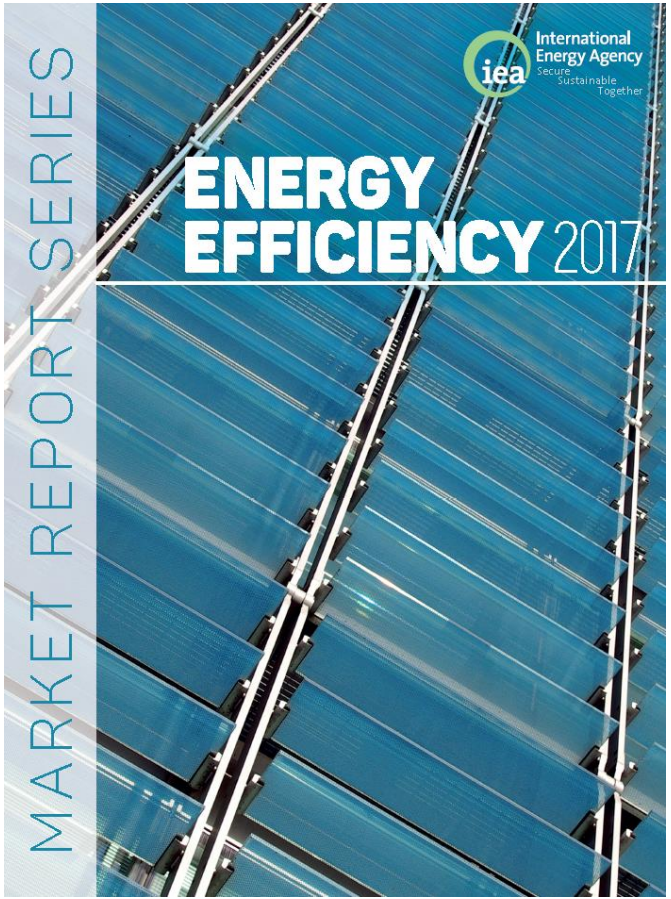
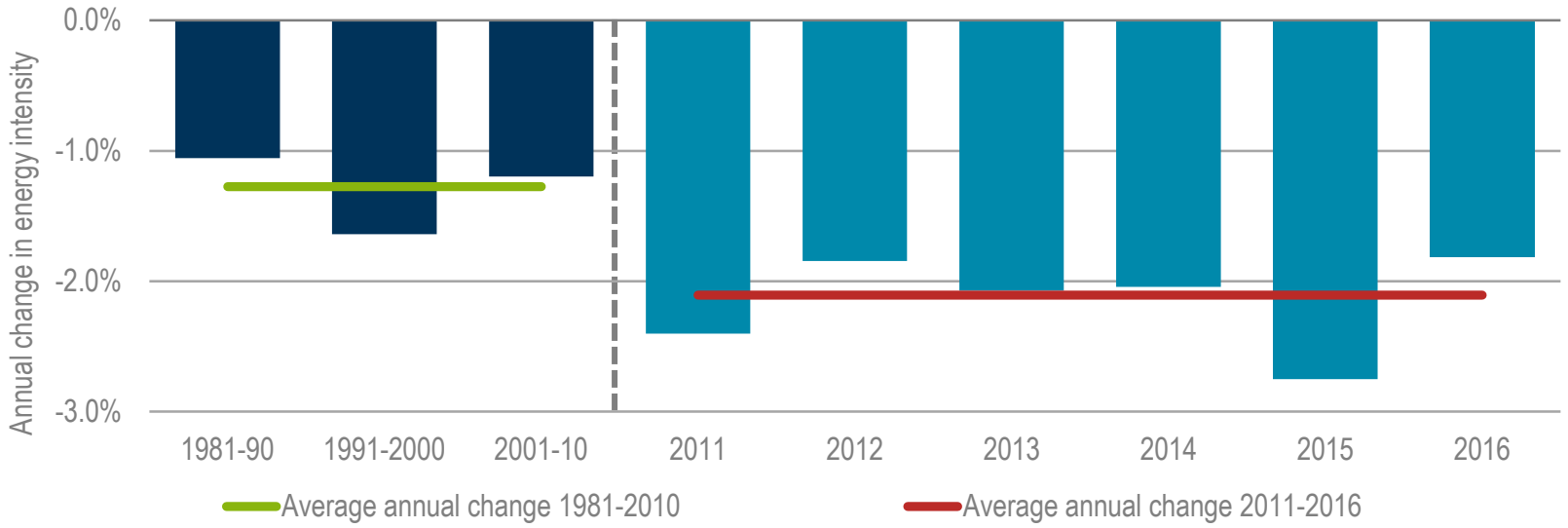


- **2016 confirmed the recent step up in global energy efficiency gains**
- **This is generating economic, social and environmental benefits**
- **But stronger policy implementation is essential**

The world is generating more value from its energy

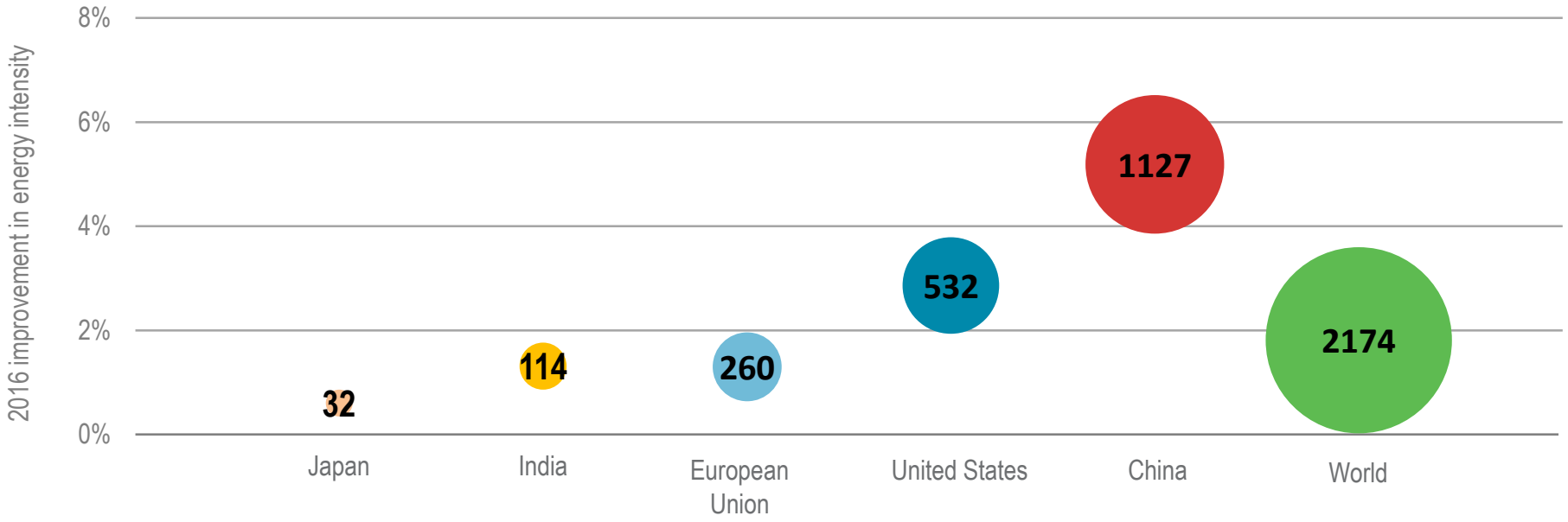
Changes in global energy intensity (energy per unit of GDP)



This decade has seen intensity improvement rates at almost double the historic average, suggesting that the world has entered a new era of faster intensity gains.

Efficiency delivers a global energy productivity bonus

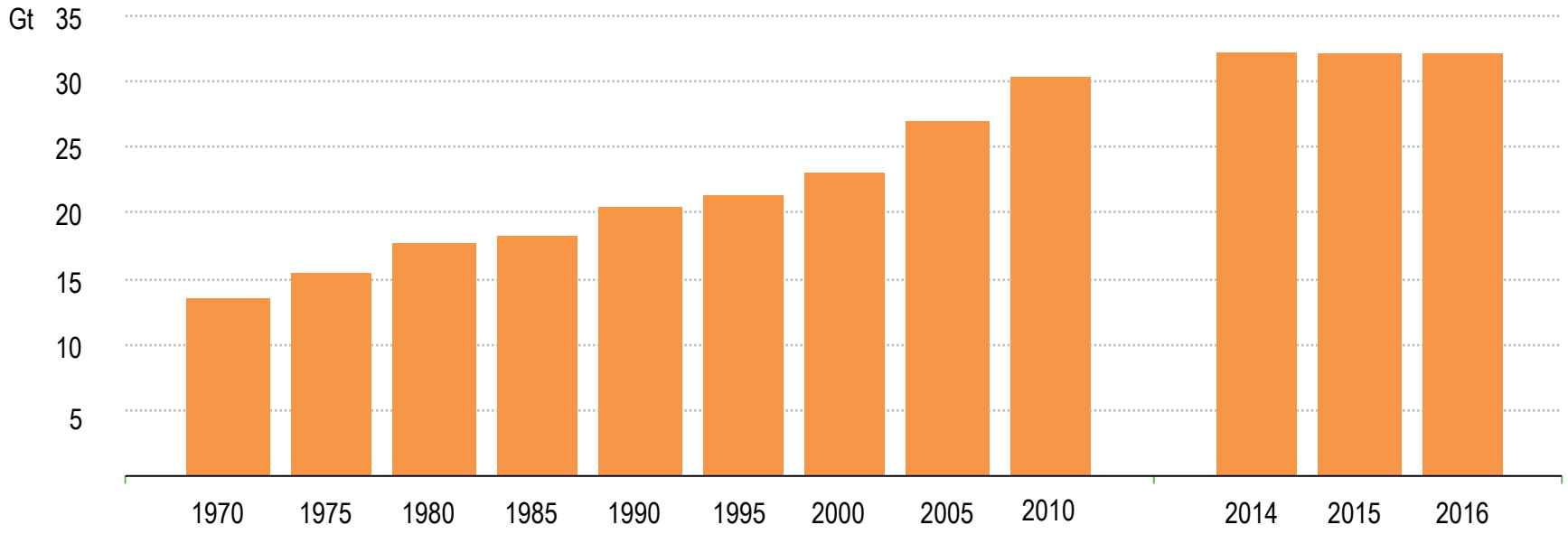
Economic value of improved energy intensity, 2016 (USD billion)



The 2016 intensity improvement represents an additional USD 2.2 trillion of value created from global energy use, equivalent to twice the size of the Australian economy.

Energy-related CO_2 emissions have been flat since 2014

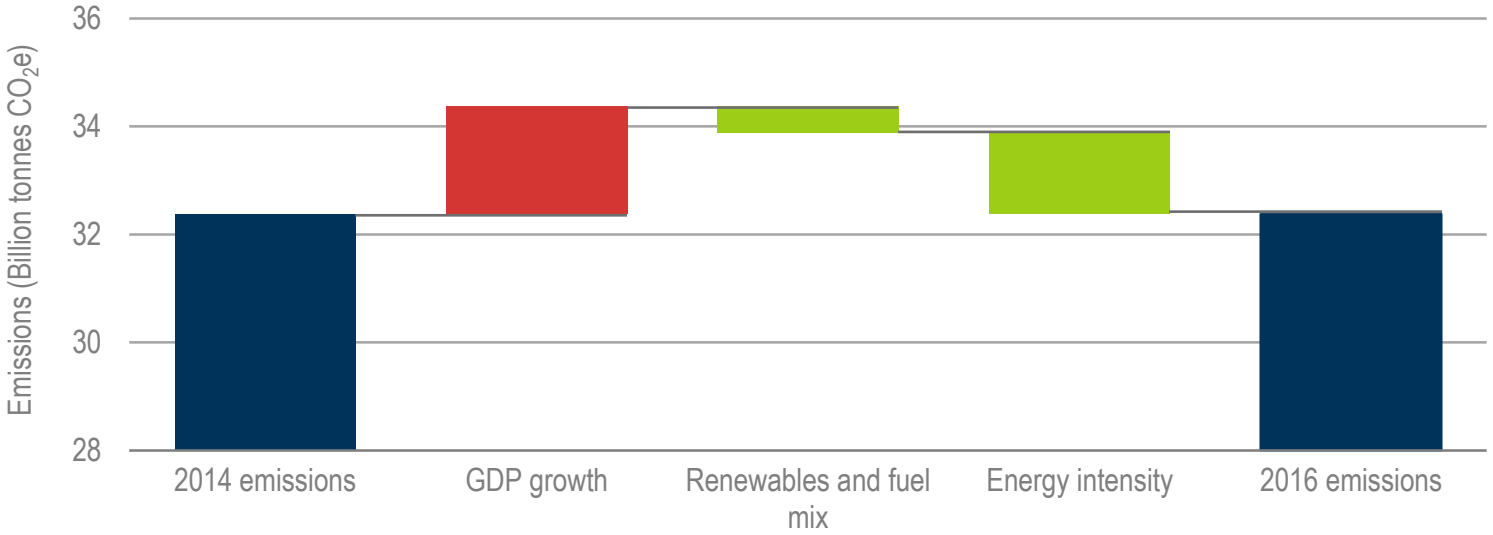
Global energy-related CO_2 emissions



IEA analysis shows that global energy-related CO_2 emissions remained flat in 2016 for the third year in a row, even though the global economy grew

Energy efficiency is helping to keep emissions down

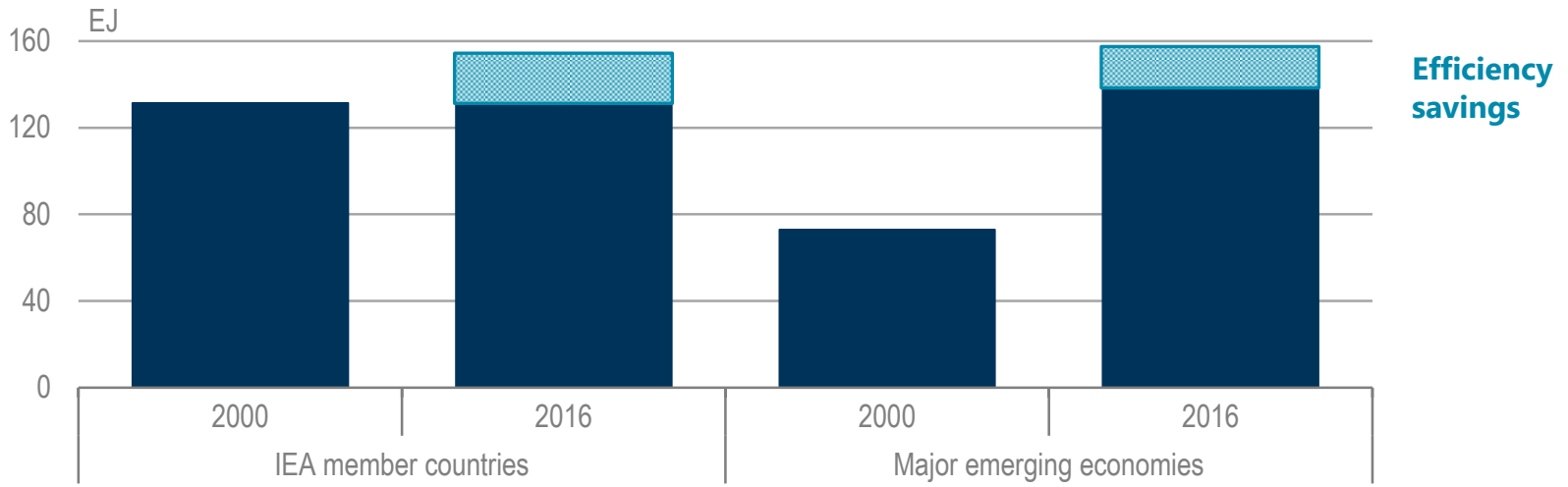
Factors influencing greenhouse gas emissions, 2014-16



Emissions would have been 2 billion tonnes higher in 2016 without the combination of energy efficiency improvement and the move towards renewables and cleaner fuels.

Energy efficiency has reduced global energy use

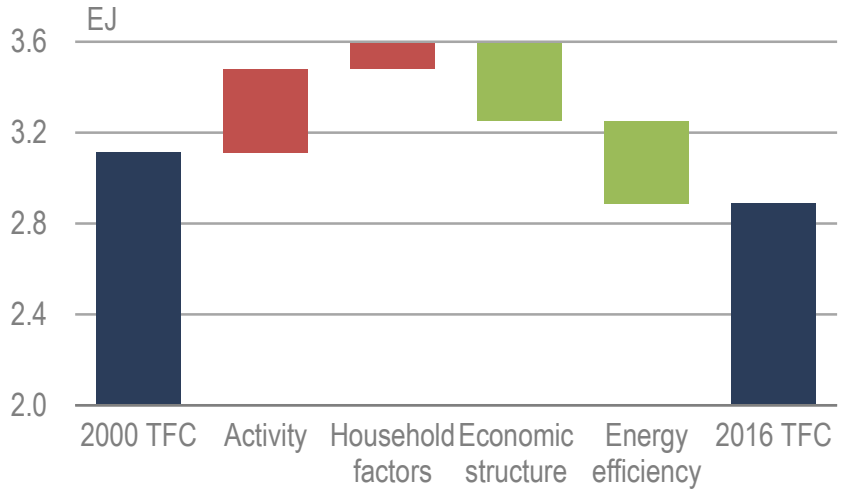
Energy use with and without energy savings from efficiency improvements, 2016

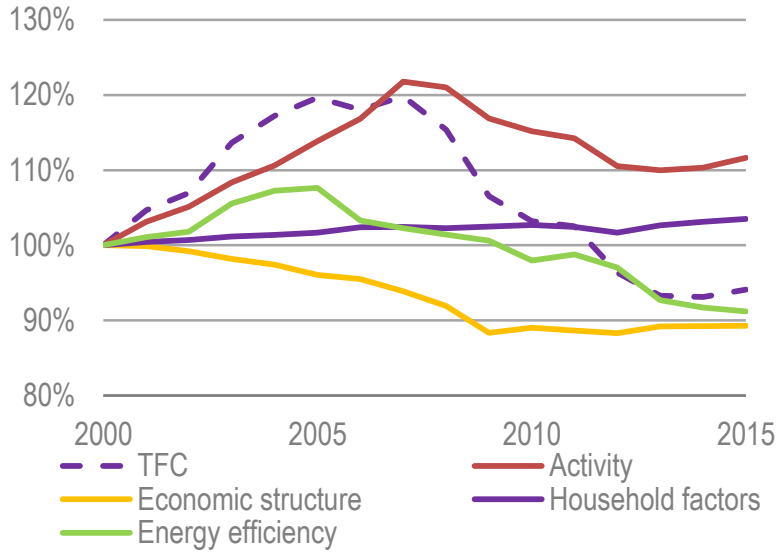


Major emerging economies are the People's Republic of China, India, Mexico, Brazil, Indonesia and the Russian Federation

Efficiency in IEA member countries has reduced energy use to levels not seen since the 1990s. Energy efficiency in the six major emerging economies avoided 13% more energy use.

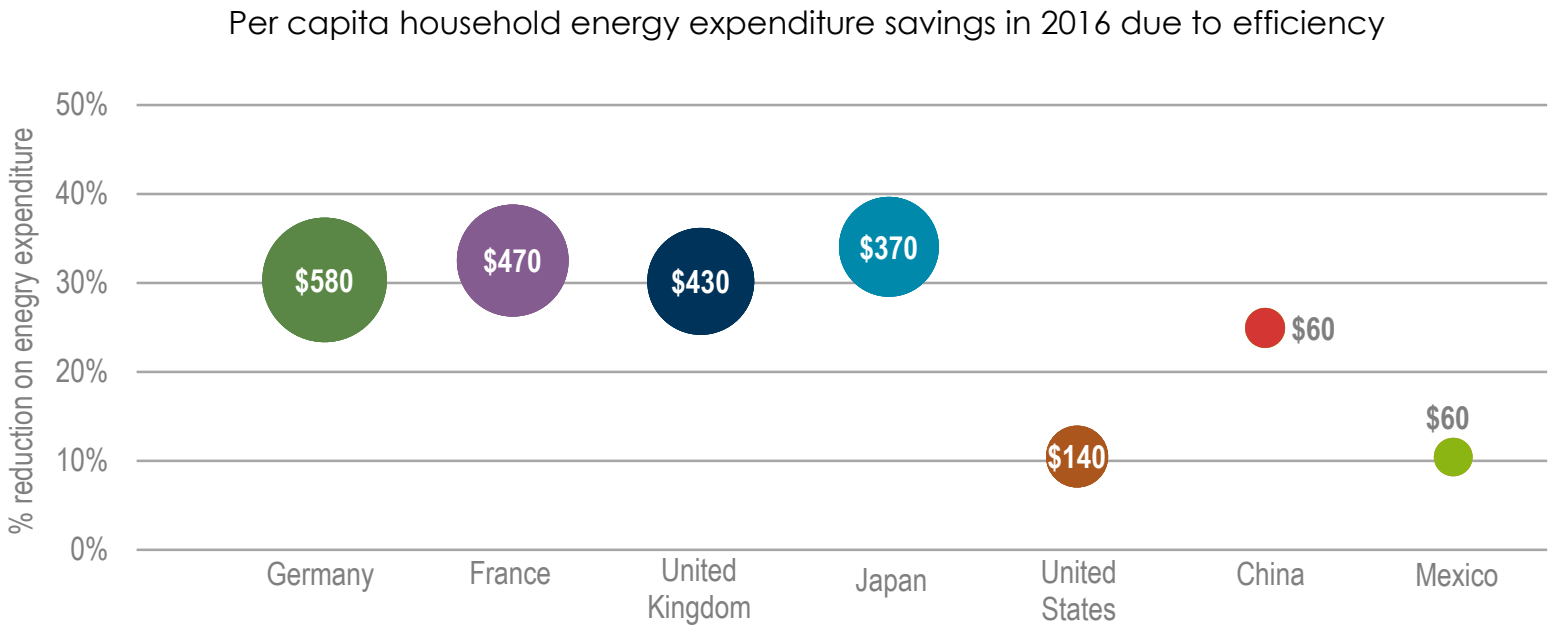
Spanish energy consumption and economic activity have decoupled





Spain has made significant progress on energy efficiency since 2005.

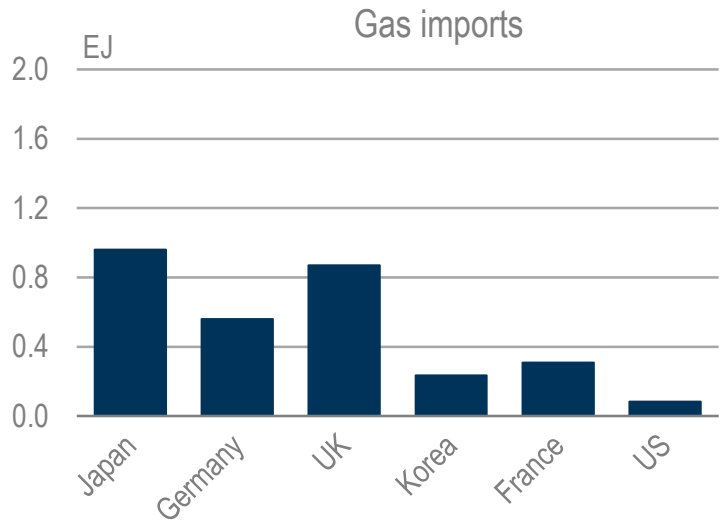
Energy consumers are making big savings

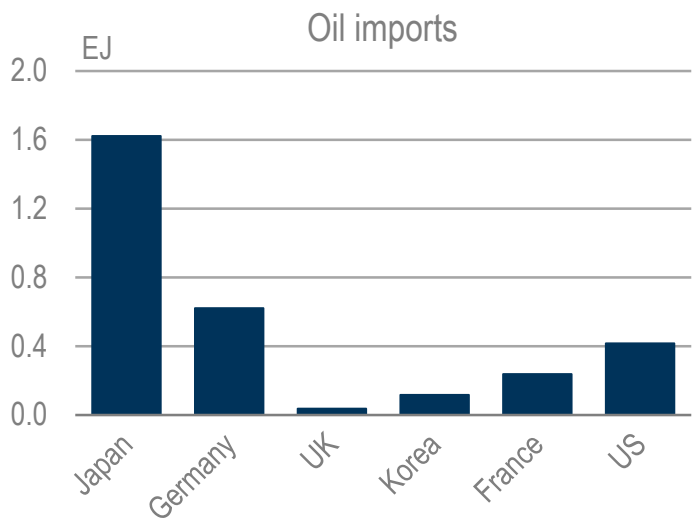


Efficiency improvements made since 2000 reduced energy spending in 2016.
German consumers saved nearly USD 50 billion on their annual home and travel energy costs.

Import savings from improved efficiency

Reductions in energy imports in 2016 from efficiency improvements since 2000 in the largest IEA member country importers

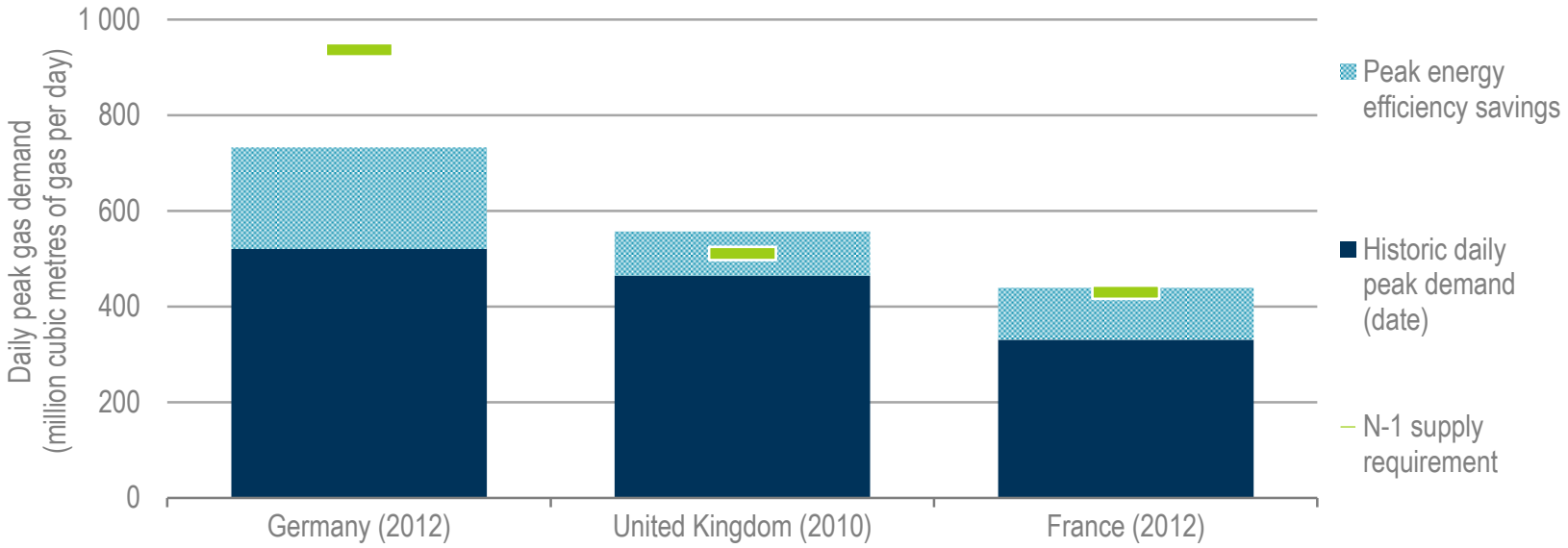




Without energy efficiency, Japan would need to import 20% more oil and gas. This would cost nearly USD 20 billion

Efficiency improves short-term energy security

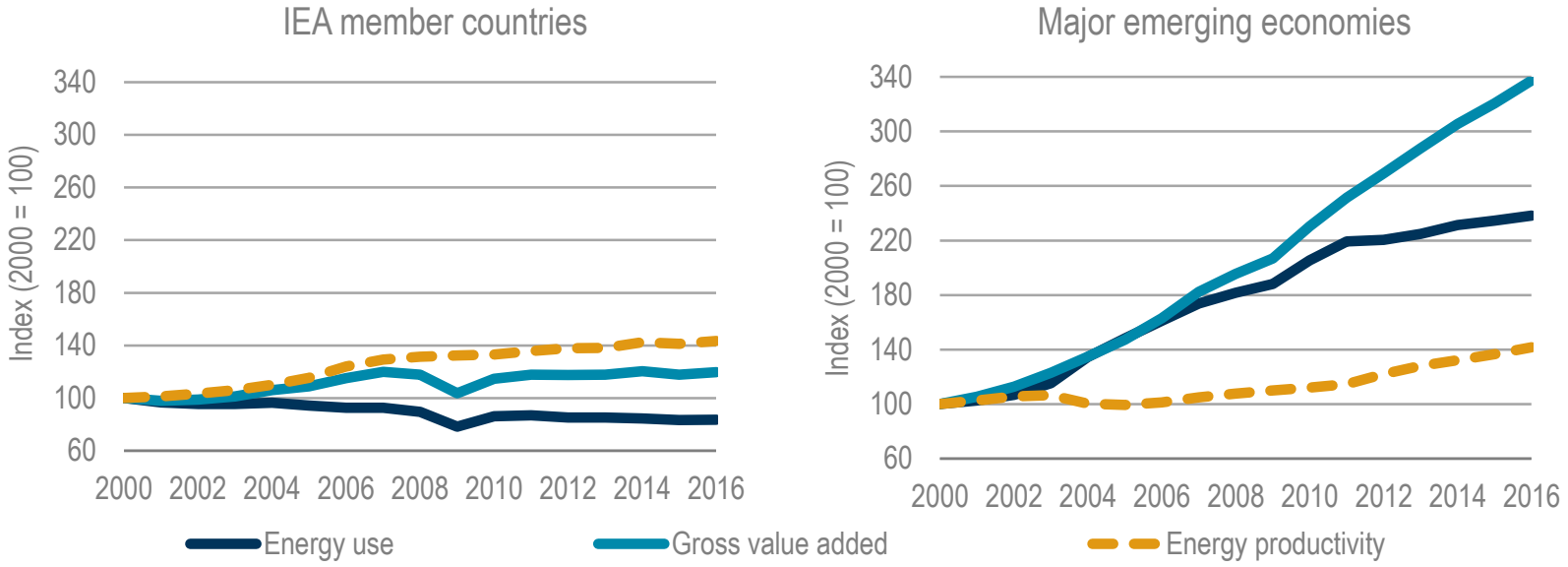
Historical peak daily gas demand and efficiency savings in selected European markets



Without energy efficiency Germany's N-1 indicator would be reduced to 128% and the United Kingdom and France would not meet the standard

Industrial energy intensity is falling

Industry energy intensity and productivity trends in IEA member countries and major emerging economies, 2000-16

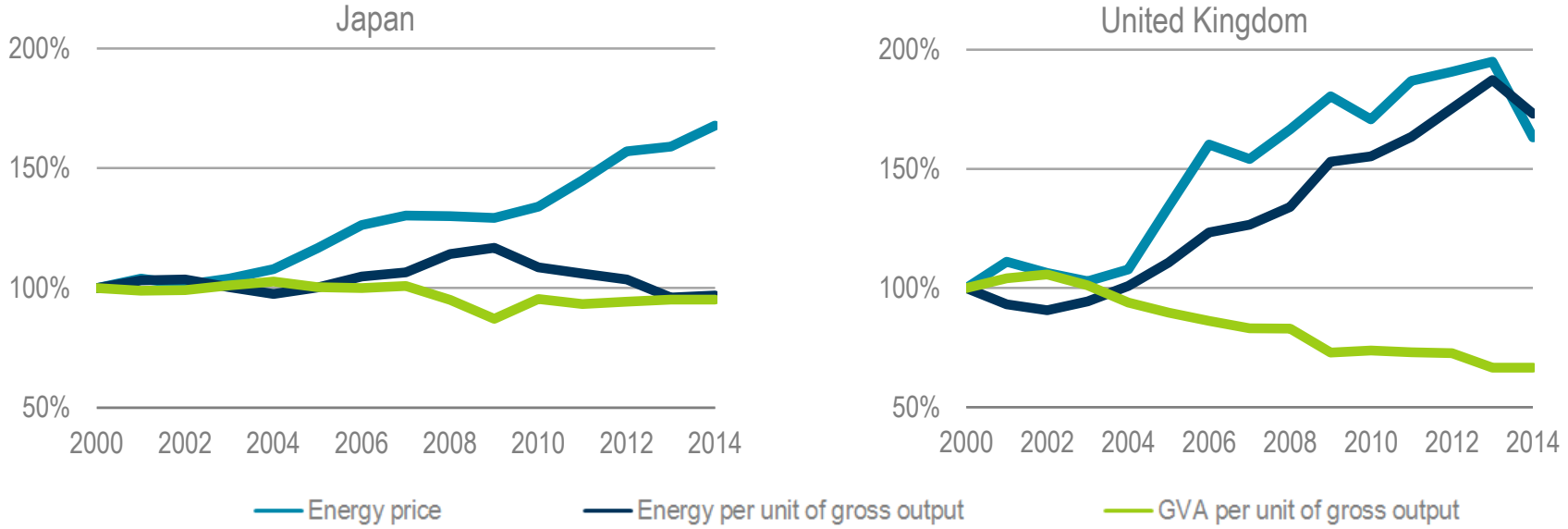


Major emerging economies are the People's Republic of China, India, Mexico, Brazil, Indonesia and the Russian Federation

Between 2000 and 2016, energy productivity in the industry sector increased by 40% in both IEA member countries and emerging economies.

Efficiency limits the impact of volatile energy prices

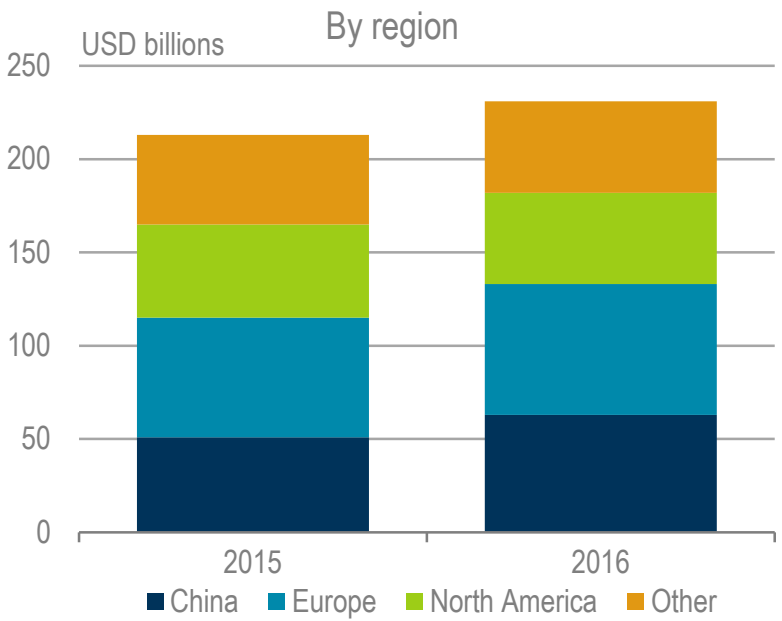
Indices of energy prices, energy costs and output in the cement sector

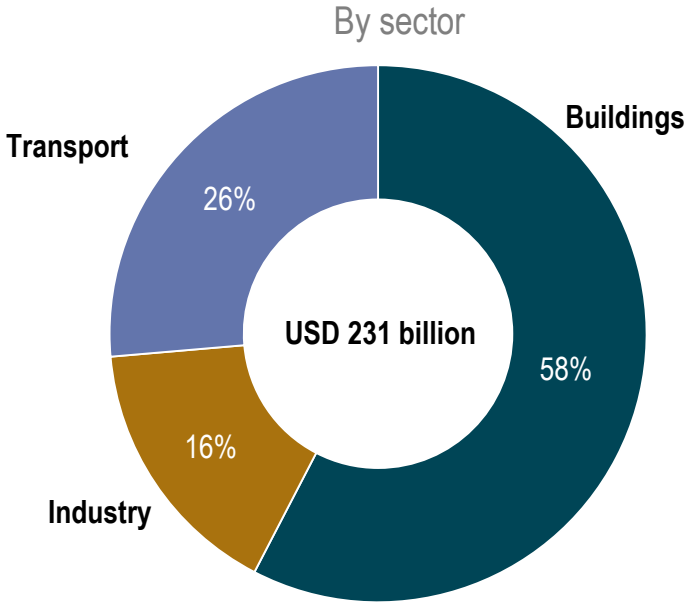


Efficiency has helped Japanese cement manufacturers to maintain their competitiveness.

Energy efficiency investment is growing

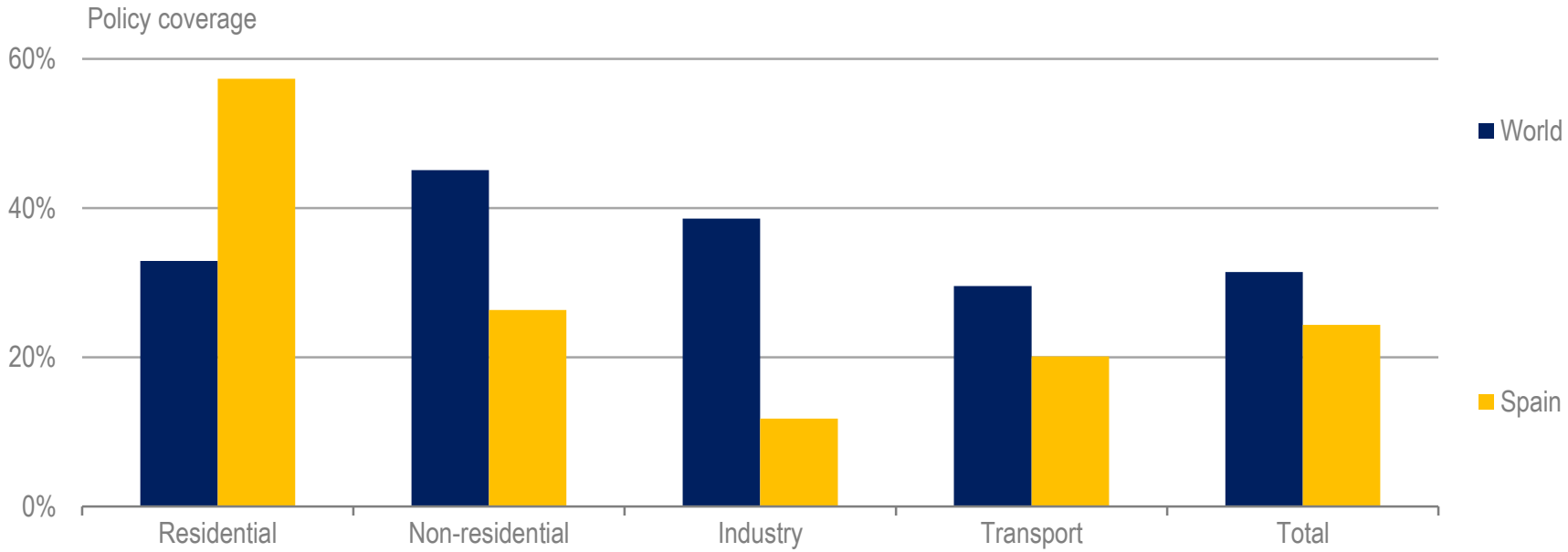
Energy efficiency investment by region and sector





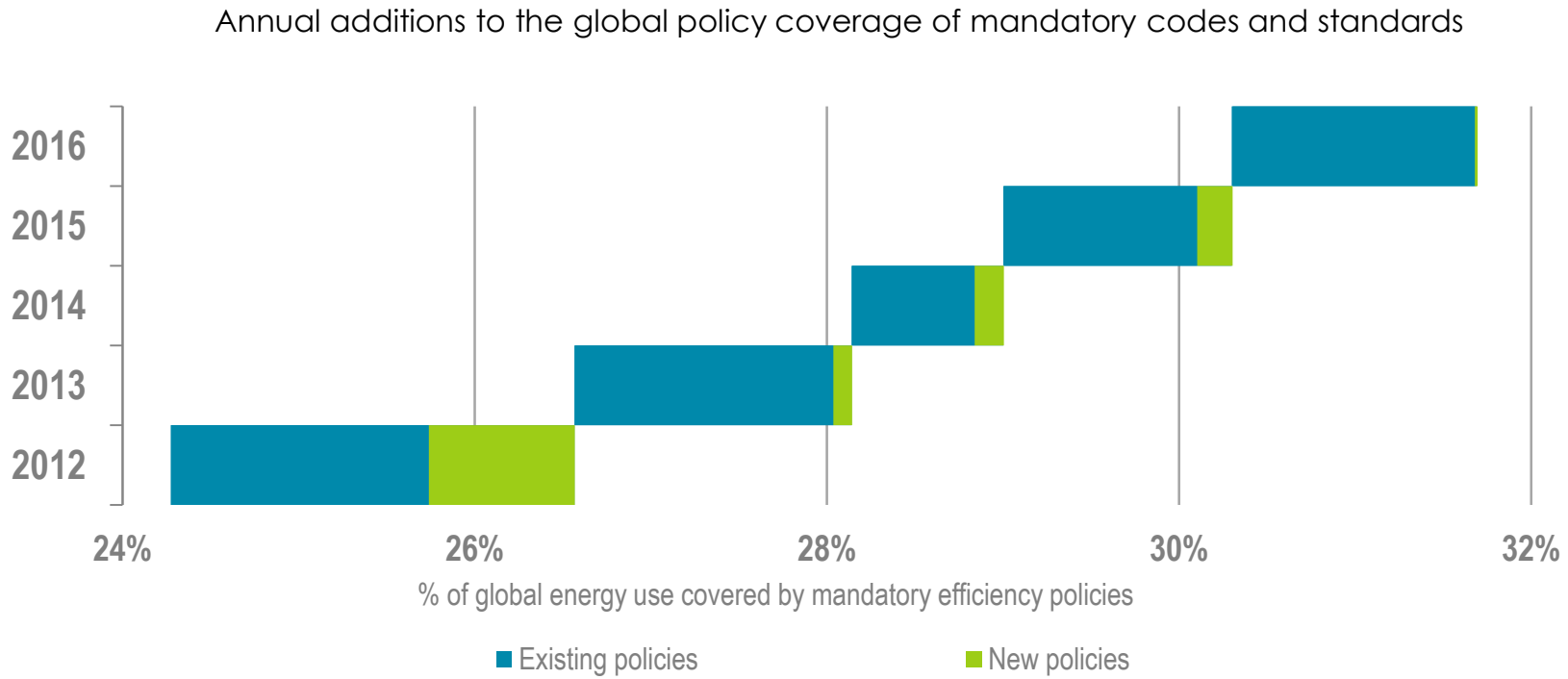
Energy efficiency investment grew 9% in 2016, with growth strongest in China. The buildings sector continues to dominate global investment.

Almost 32% of the world's energy use is covered by codes and standards



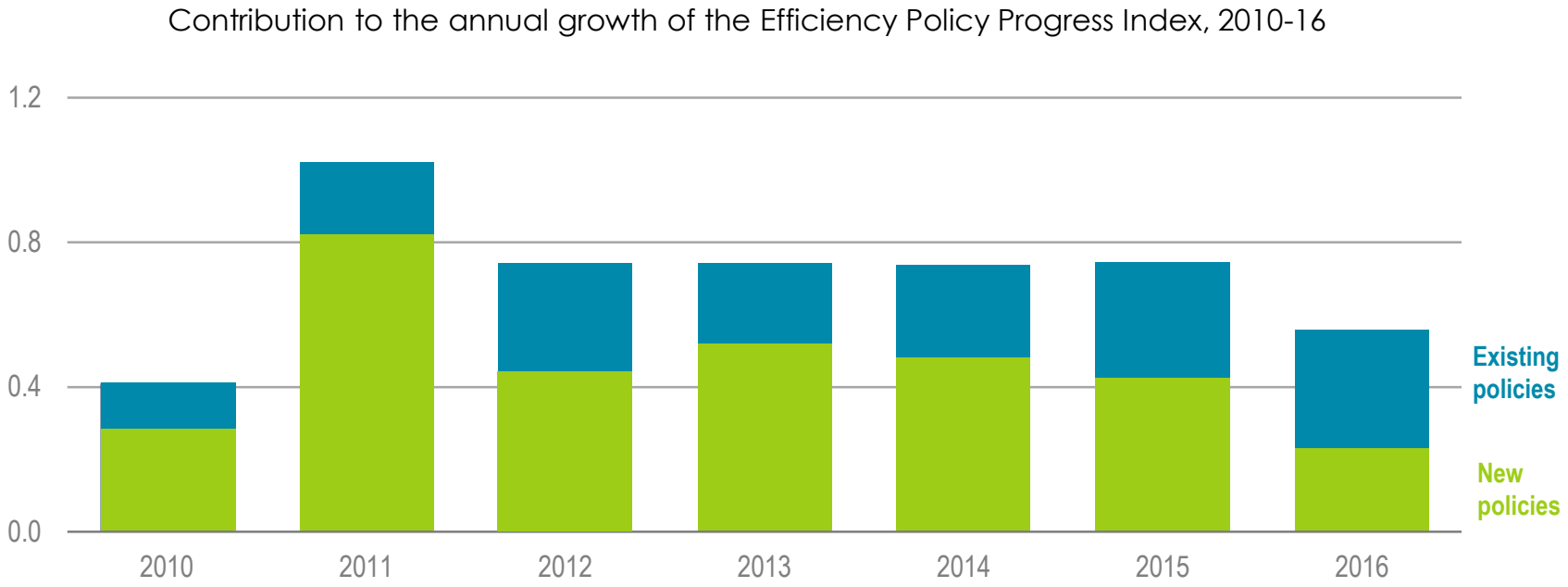
As in the rest of Europe, policy coverage in the transport and industrial sectors is relatively low in Spain.

Policies of the past drive progress of today



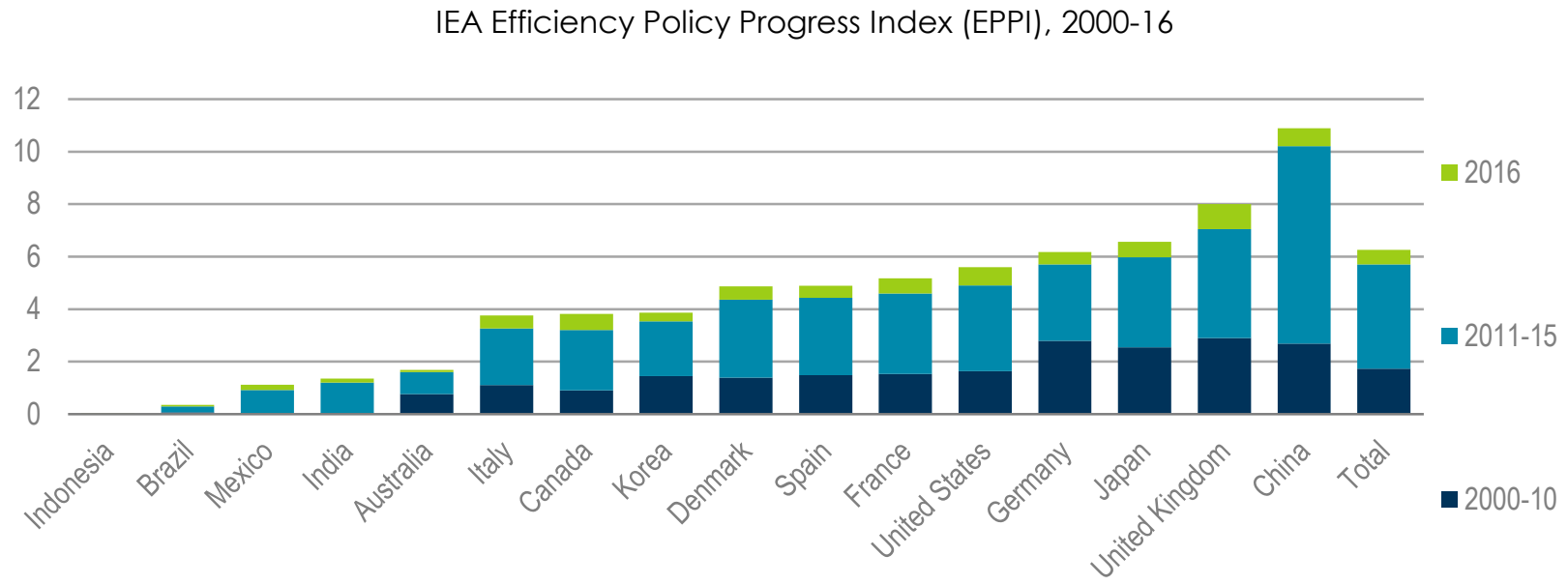
The amount of global energy use covered by mandatory efficiency policies grew to nearly 32% in 2016. We owe the efficiency gains of today to the policies of the past .

Global progress has become reliant on pre-existing policies



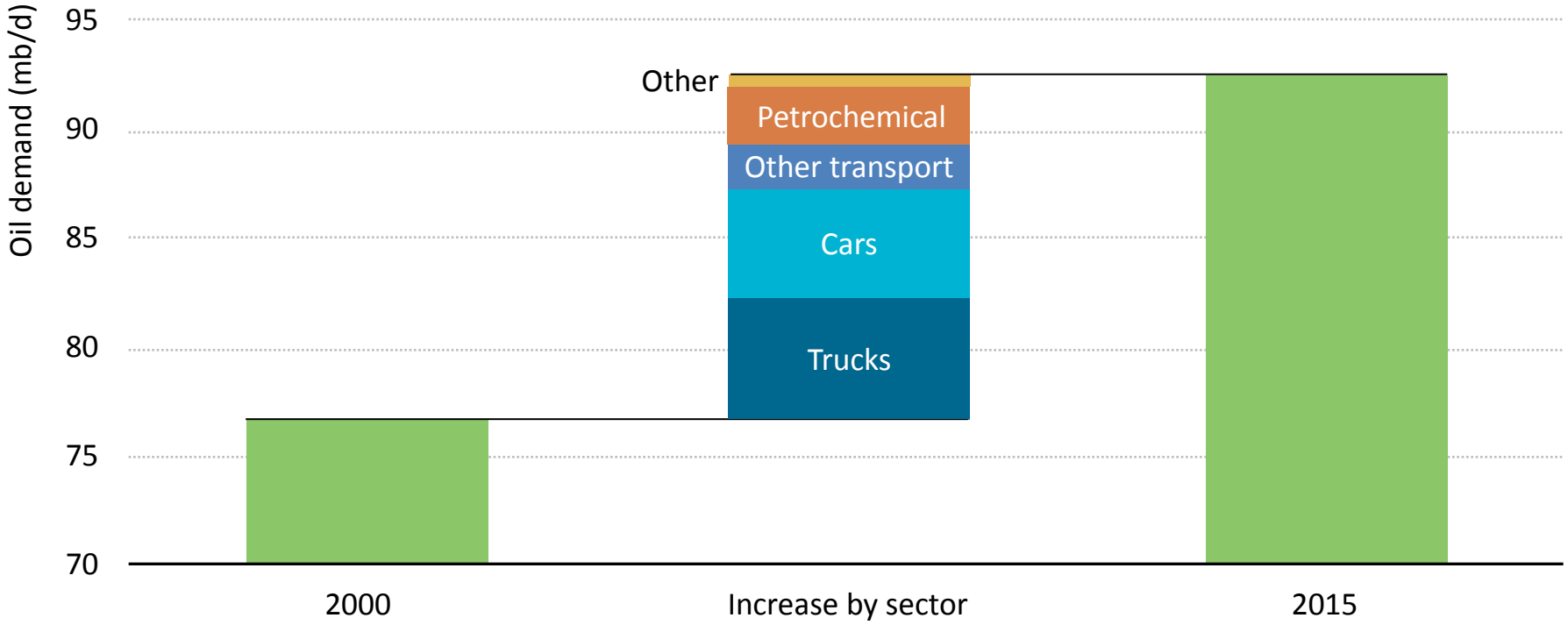
The global Efficiency Policy Progress Index (EPPI) grew 0.5 percentage points 2016 to 6.3. Progress was driven by pre-existing policies, not new policies.

Policy progress varies across countries



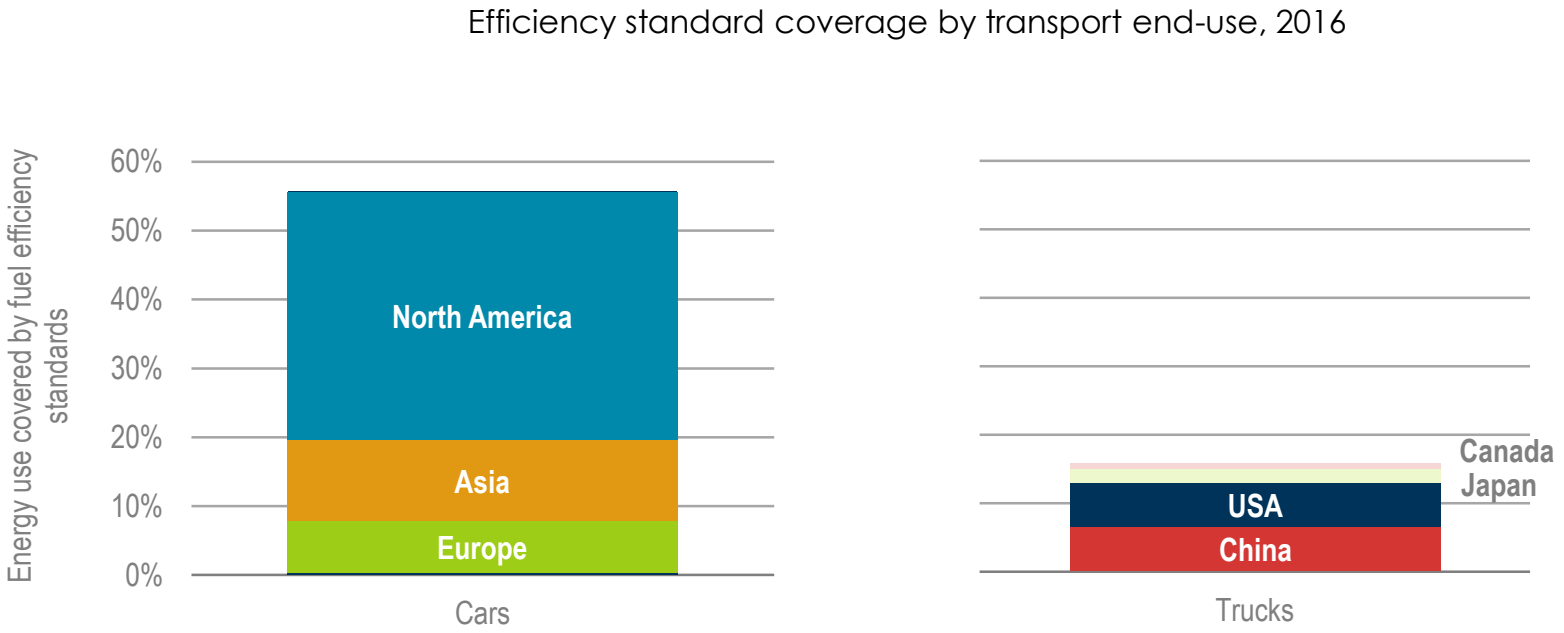
The total index in 2016 was 6.3, meaning codes and standards implemented since 2000 are designed to improve the minimum energy efficiency performance across the 16 countries by 6.3% relative to 2000.

Trucks drive global oil demand



Trucks were responsible for nearly 40% of the growth in global oil demand since 2000; they are the fastest growing source of oil demand, in particular for diesel.

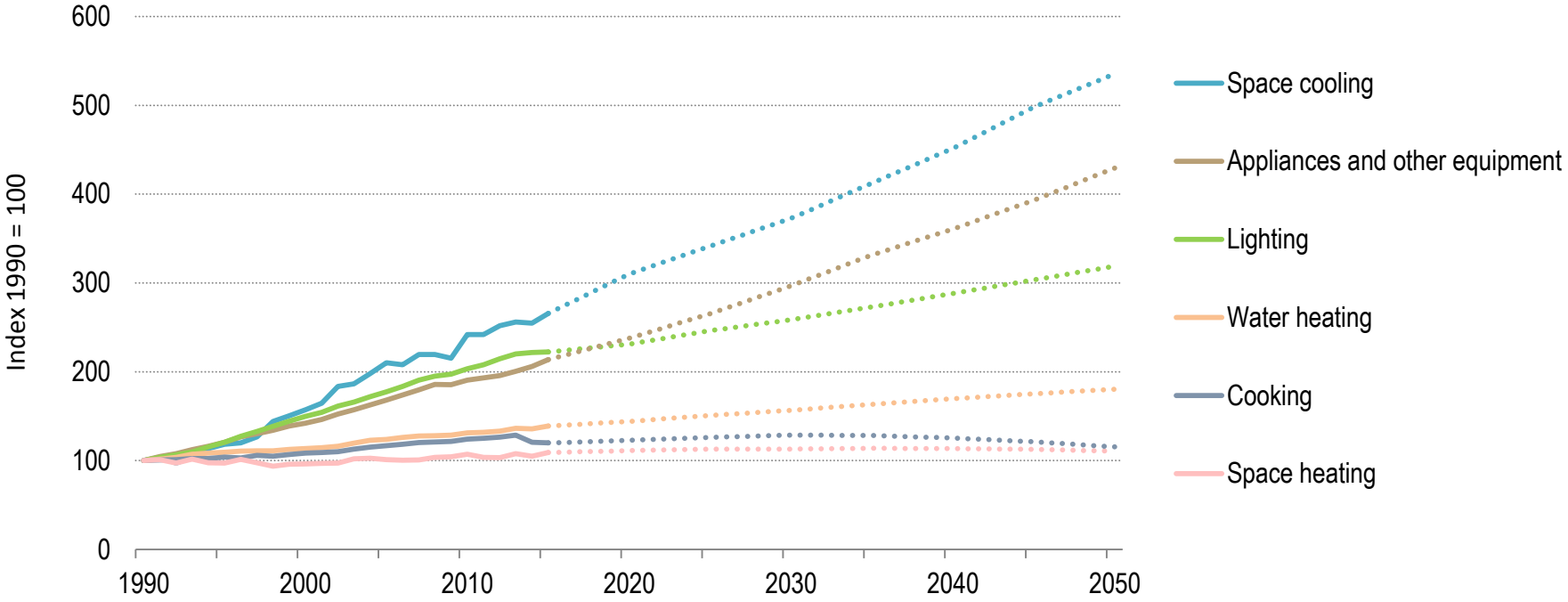
Vehicle efficiency policy is two-speed



Nearly 40 countries have fuel efficiency standards for cars.
Only Canada, China, Japan and the United States have standards for trucks.

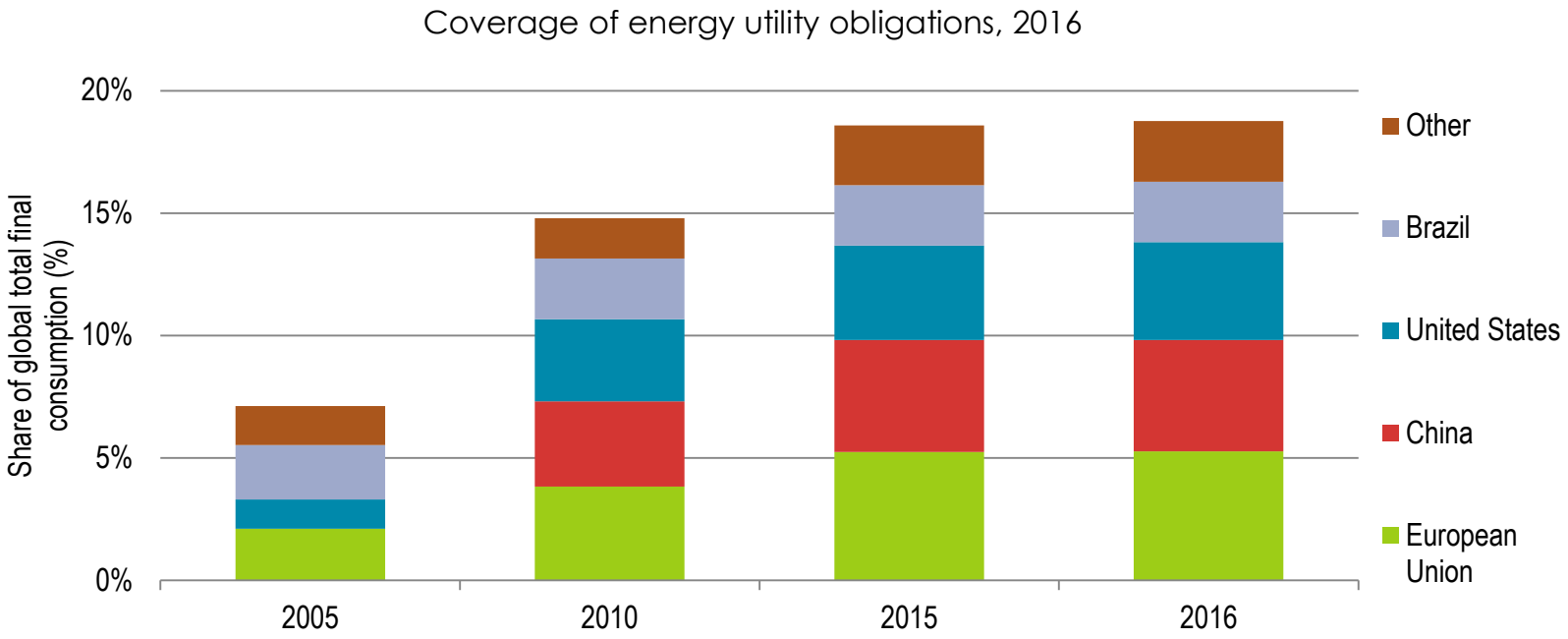
Space cooling energy use growth

Global energy consumption by building end-use, 1990-2050



Space cooling will continue to be the fastest growing source of energy demand in buildings. Efficiency policy is weakest in countries where demand is rising fastest.

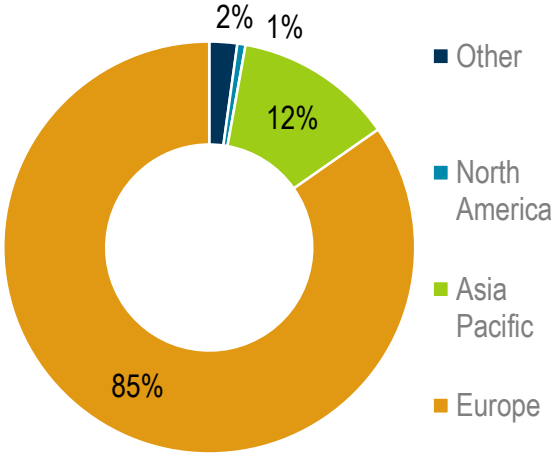
Coverage and strength of energy utility obligations increased markedly over the past decade

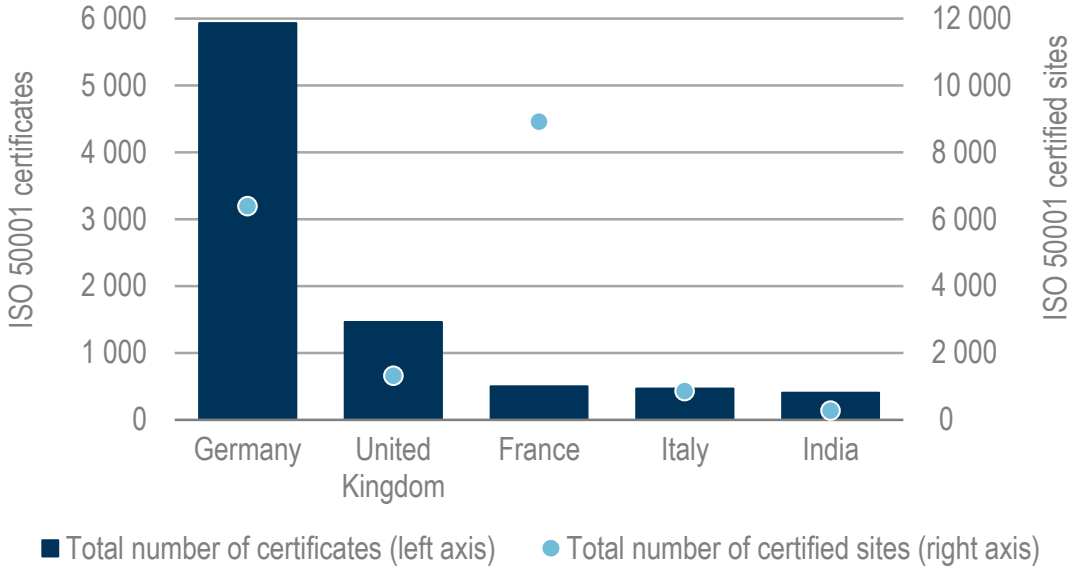


The percentage of global final energy use covered by obligation programmes rose from 7% in 2005 to 19% in 2016. There was no increase between 2015 and 2016 owing to the lack of new programmes.

Energy management is key to system-wide measures

ISO 50001 certifications by region and country

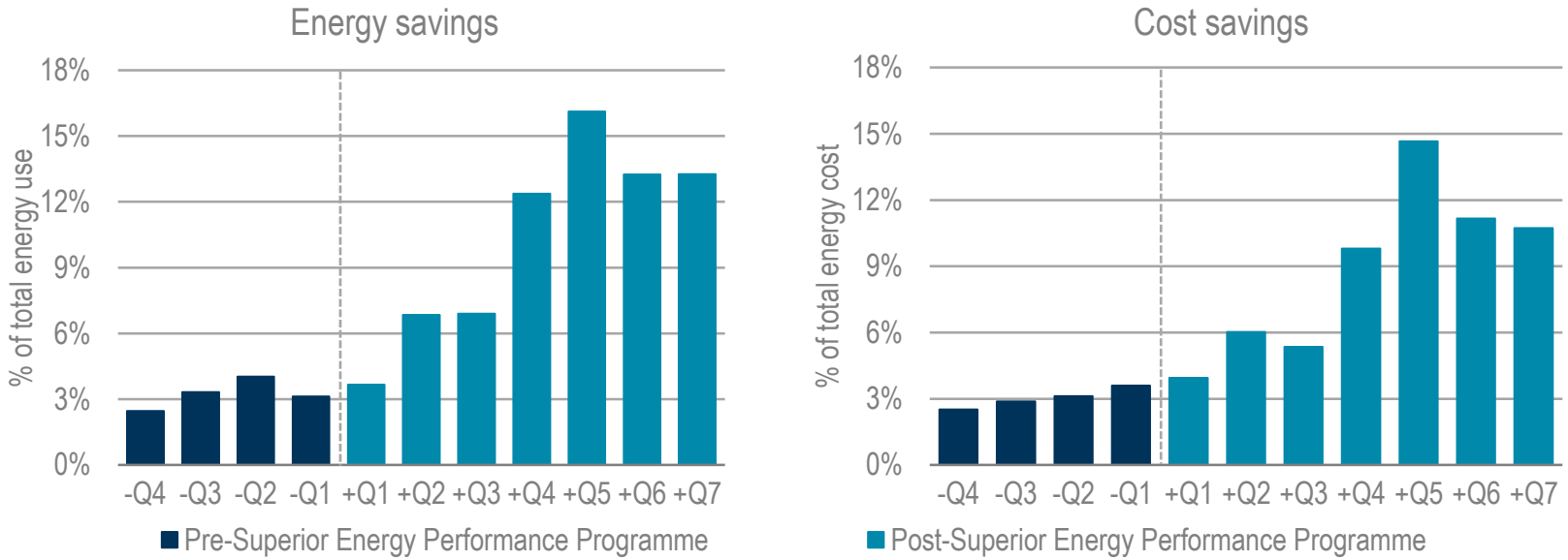




Take-up of energy management systems is growing, with ISO 50 001 most apparent in Europe. Chinese companies favour a different energy management system GB/T 23331

Energy management systems do produce real benefits

Verified average savings from ISO 50001 energy management system, United States



Source: LBNL (2015), Development of an Enhanced Payback Function for the Superior Energy Performance Program.

Energy management systems can achieve energy and financial savings of over 10%, as well as non-energy benefits such as better staff skills and improved management of other production inputs.

Concluding remarks

- *Energy Efficiency 2017* shows the critical importance of energy efficiency to economies, households, businesses and the environment.
- There has been a step up in efficiency gains in recent years, despite lower energy prices, and this is having many positive impacts.
- Governments must renew their focus on policy implementation and attacking the 68% of energy use that is not covered by mandatory efficiency policies.
- Energy management is central to unlocking the system-wide efficiency gains needed if deeper savings are to be made.
- The IEA is helping countries realise unmet energy efficiency potential by training policy makers, facilitating knowledge sharing and providing policy advice.

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