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# Energy Efficiency Today: IEA's 2015 Market Report

*IEEJ, Tokyo, October 6, 2015*

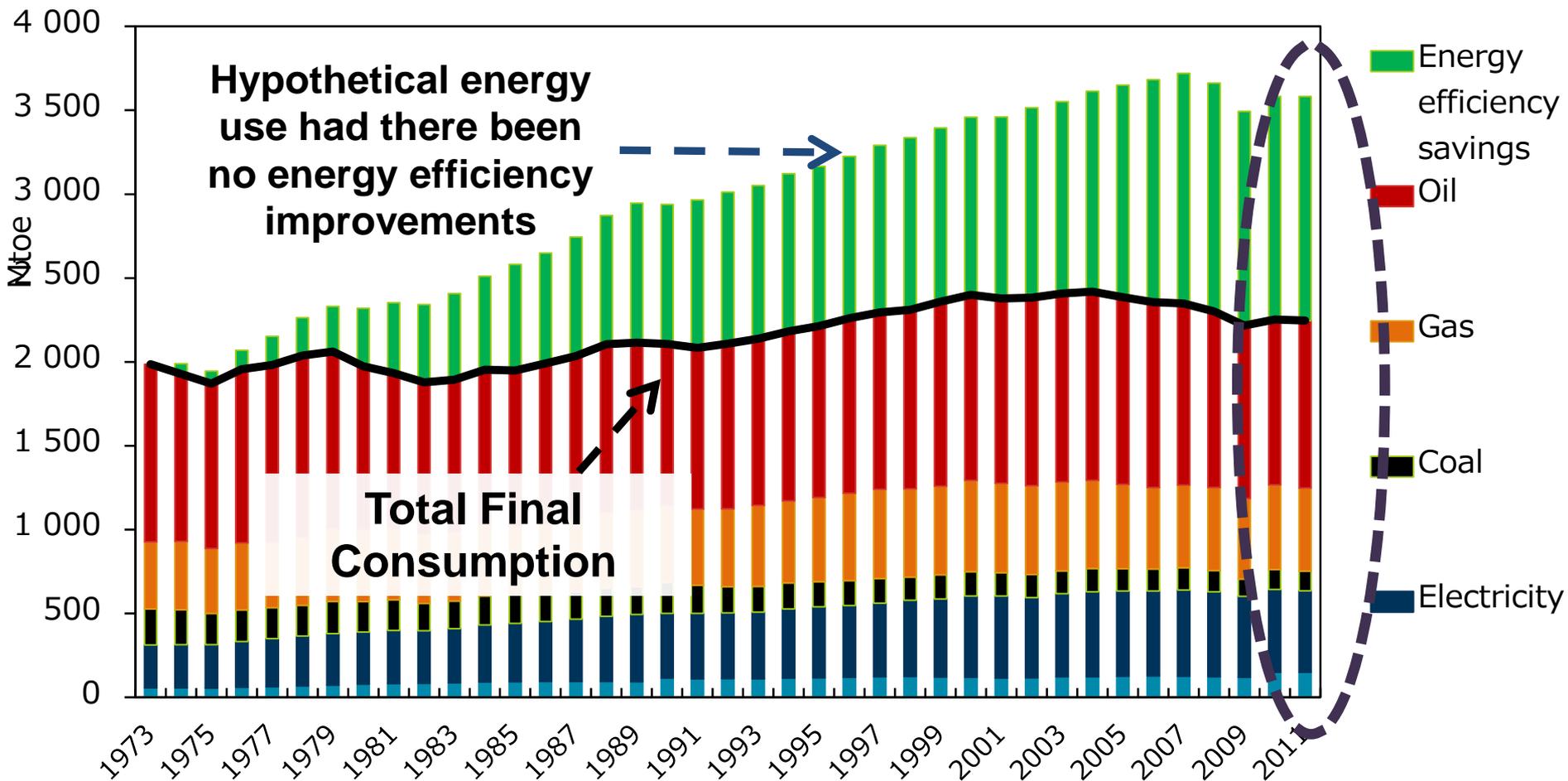
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Head, Energy Efficiency and Environment Division  
International Energy Agency*

[www.iea.org](http://www.iea.org)

# Energy efficiency: the 'first fuel'

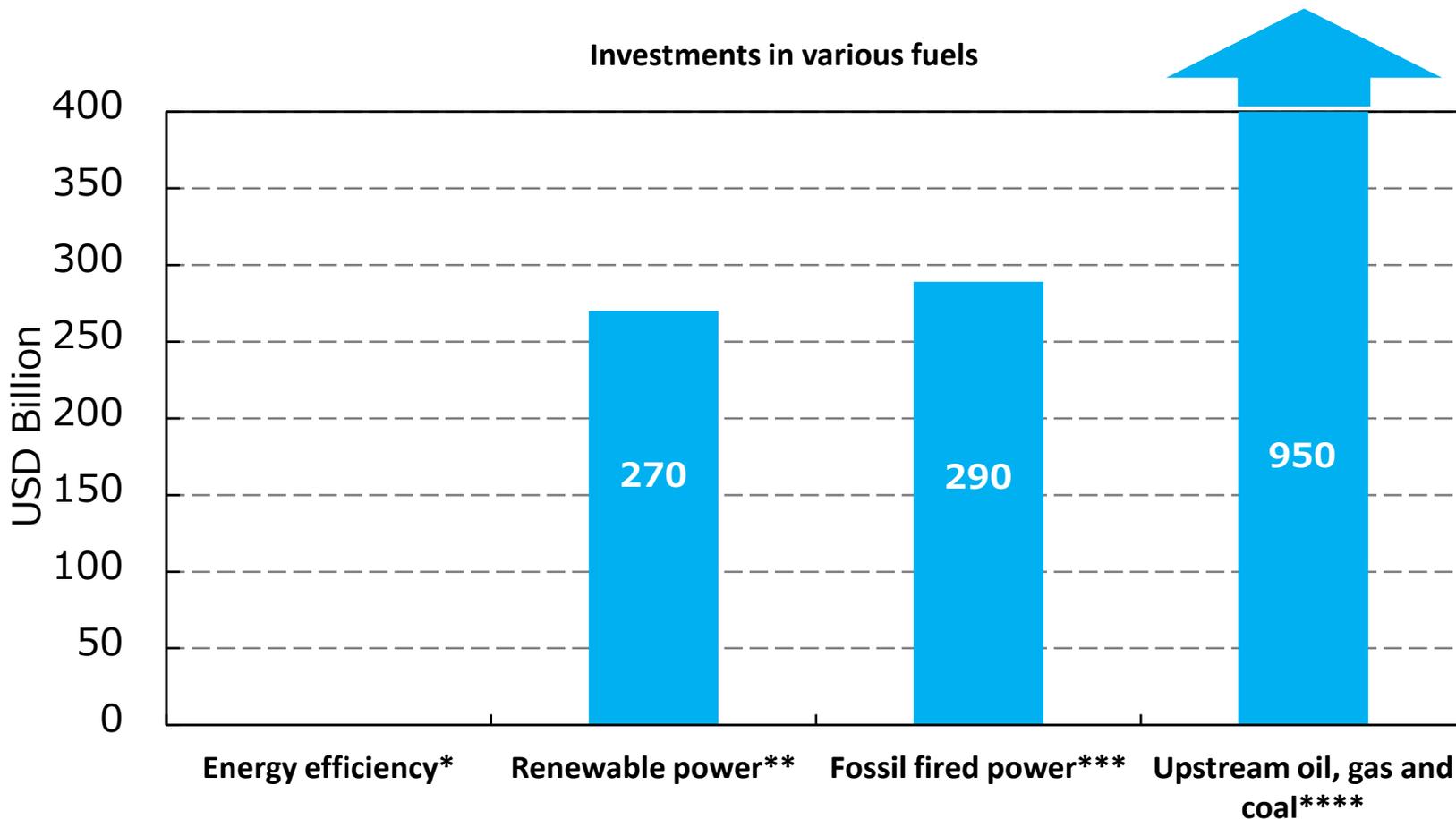
## ■ Savings from efficiency 60% of TFC in 2014

TFC and savings within IEA countries (IEA-11\*) from EE investments since 1973



\*IEA-11: Australia, Denmark, Finland, France, Germany, Italy, Japan, Netherlands, Sweden, United Kingdom, United States

# Energy efficiency investment: bigger than you might think

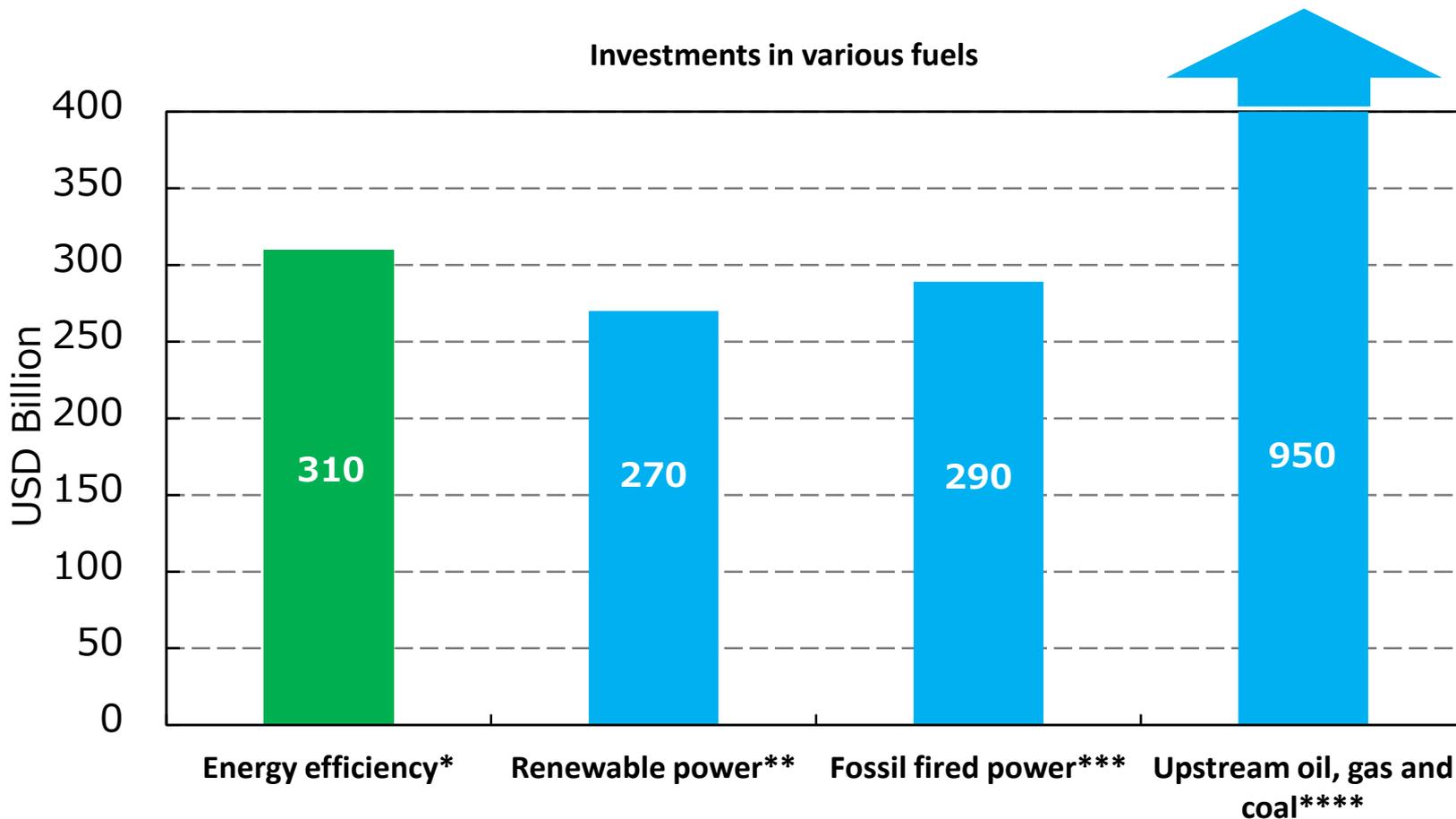


\* IEA (2014), Energy Efficiency Market Report, Paris: OECD/IEA. \*\* IEA (2015), Renewable Energy Market Report, Paris: OECD/IEA.

\*\*\* Frankfurt School-UNEP Center (2015), Global Trends in Renewable Energy Investment, Frankfurt: Frankfurt School of Management, UNEP and Bloomberg New Energy Finance.

\*\*\*\* IEA (2014), World Energy Investment Outlook, Paris: OECD/IEA.

# Energy efficiency investment: bigger than you might think



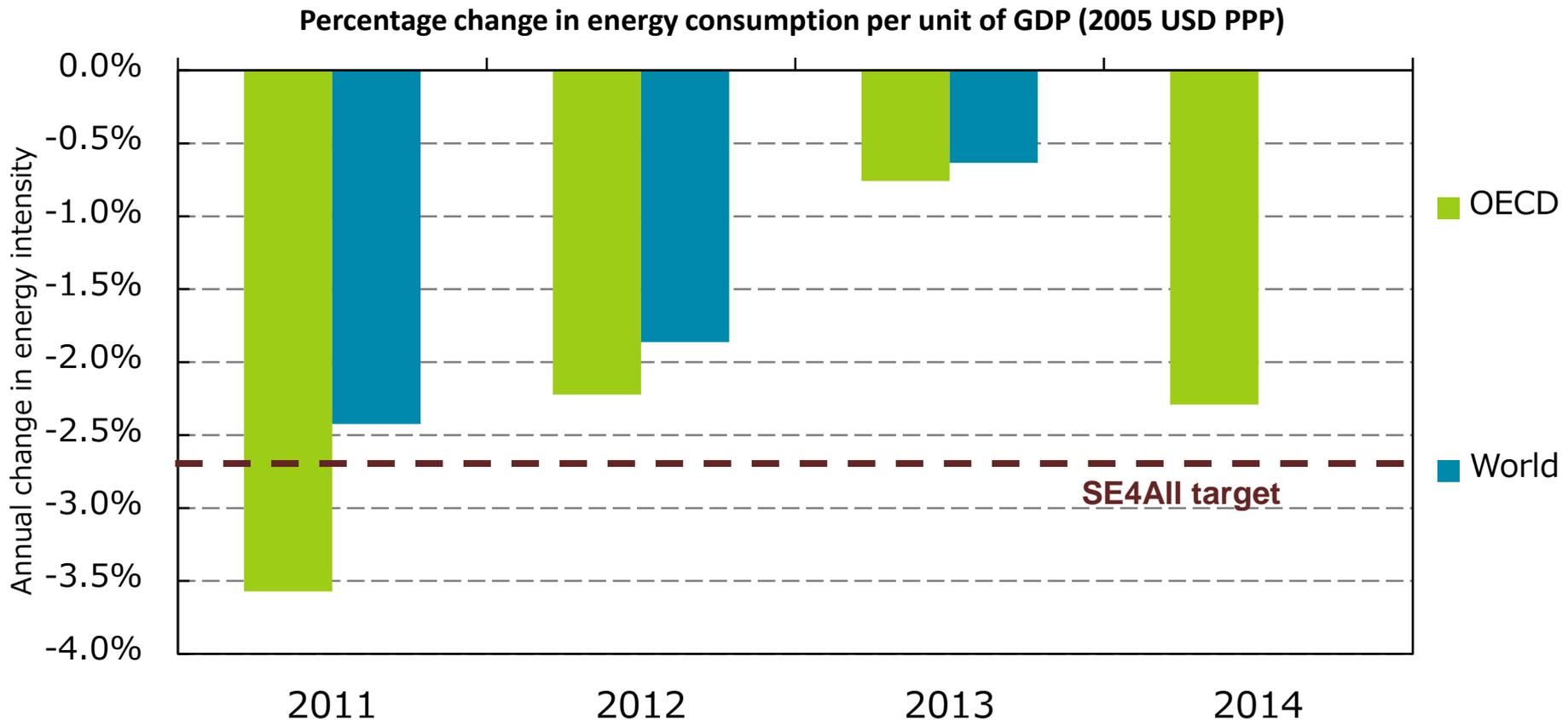
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# Energy intensity in OECD countries improved in 2014

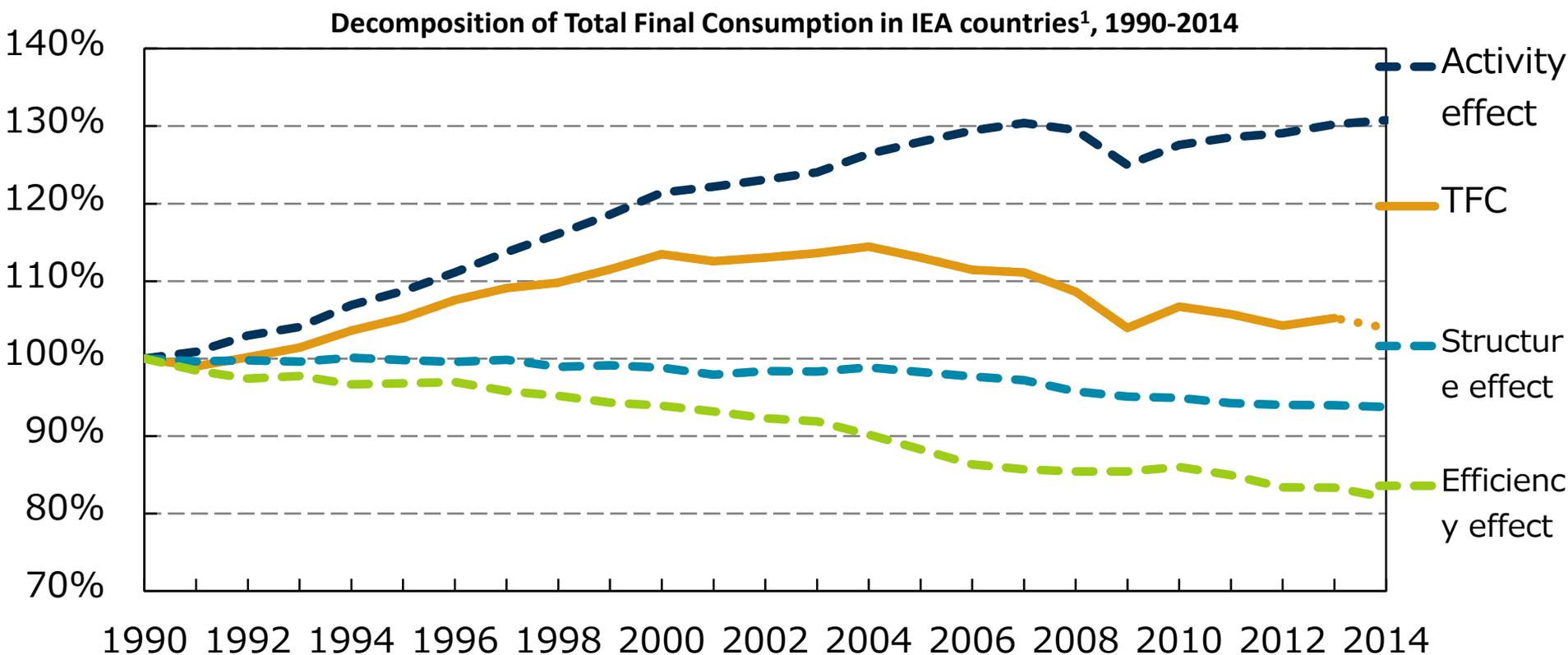
- Energy intensity in OECD countries declined by 2.3% in 2014



***Within range of the 2.6% per annum SE4ALL target in 2014***

# Energy efficiency is flattening energy consumption

- Total final consumption peaked in 2004 in IEA countries



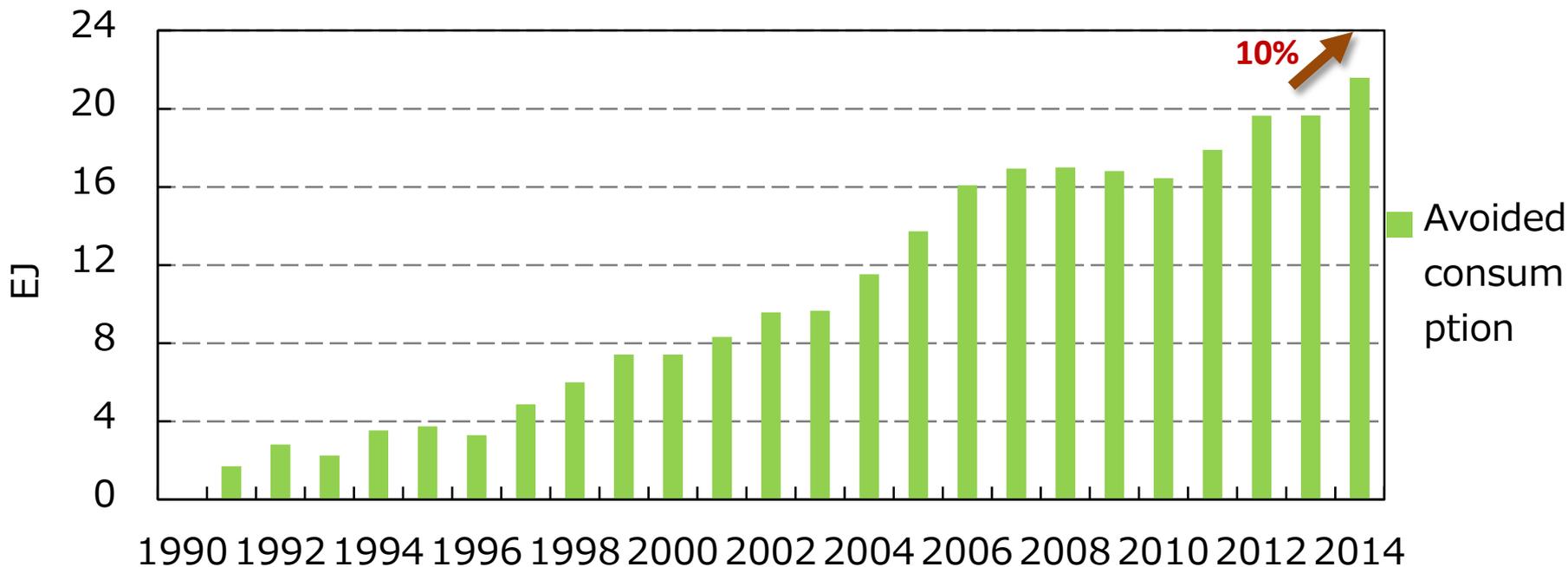
***Energy efficiency is responsible for two thirds of the shift in demand***

<sup>1</sup> Decomposition for Australia, Denmark, Finland, France, Germany, Italy, Japan, the Netherlands, Sweden, the United Kingdom and the United States.

# Avoided consumption topped 22 EJ (520 Mtoe) in 2014

- Avoided consumption generated by energy efficiency increased by 10% in 2014

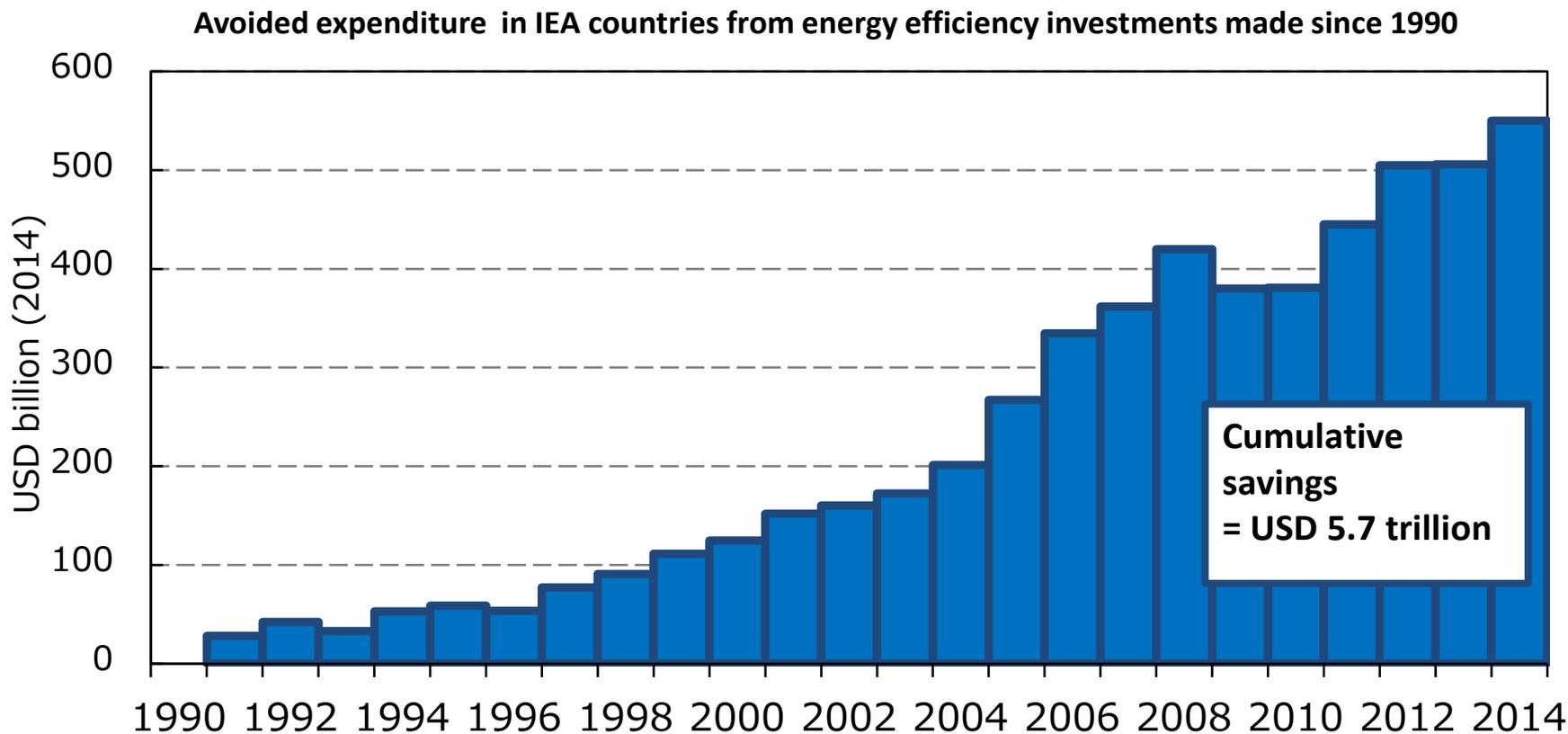
Avoided TFC in IEA countries from energy efficiency investments made since 1990



**IEA countries avoided more consumption in 2014 than the TFC of Japan and Korea combined**

# IEA consumers are saving hundreds of billions of dollars each year

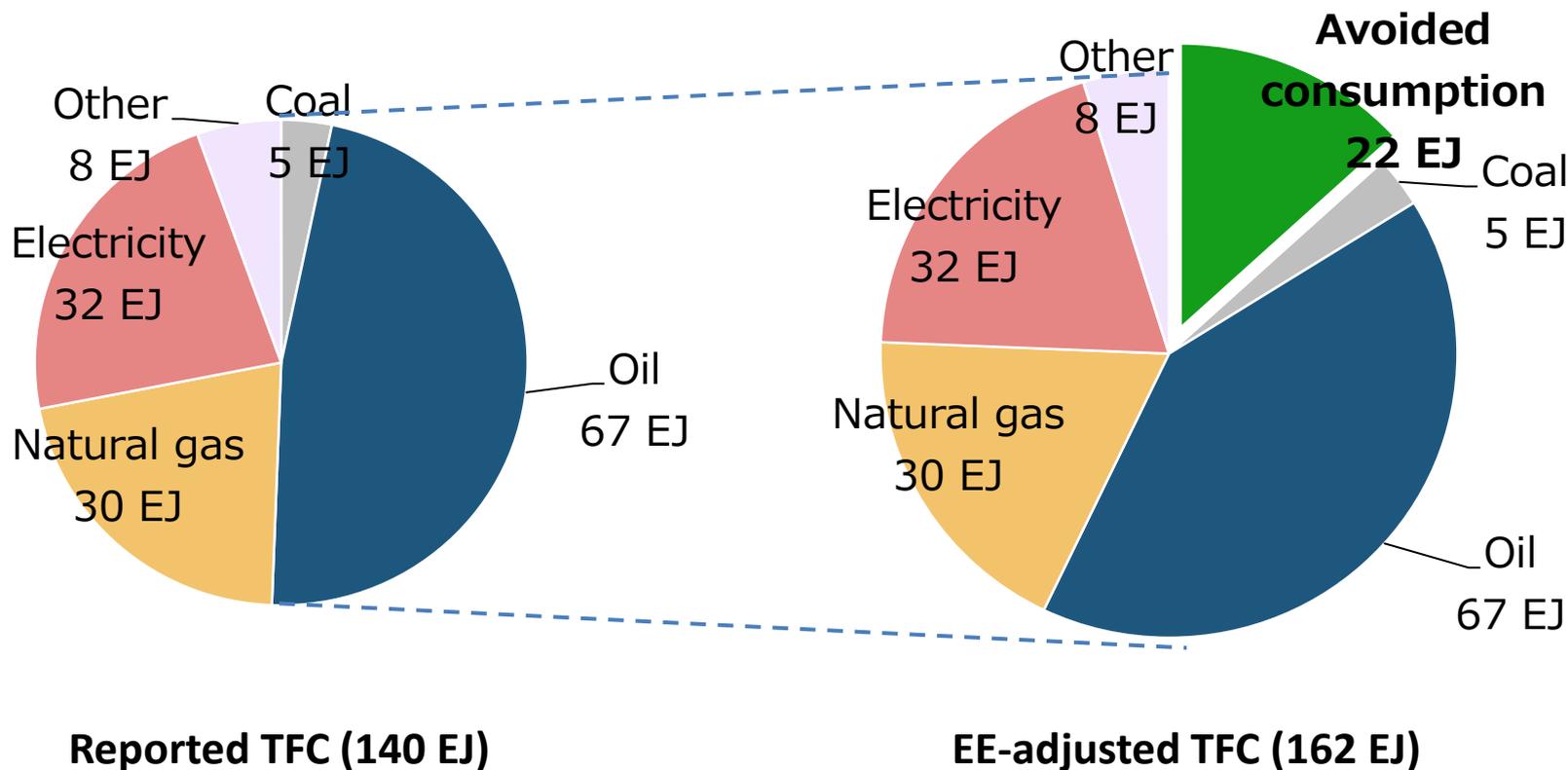
- IEA countries saved USD 550 billion in 2014 as a result of energy efficiency investments since 1990



***Annual savings are greater than the EU's fuel import bill***

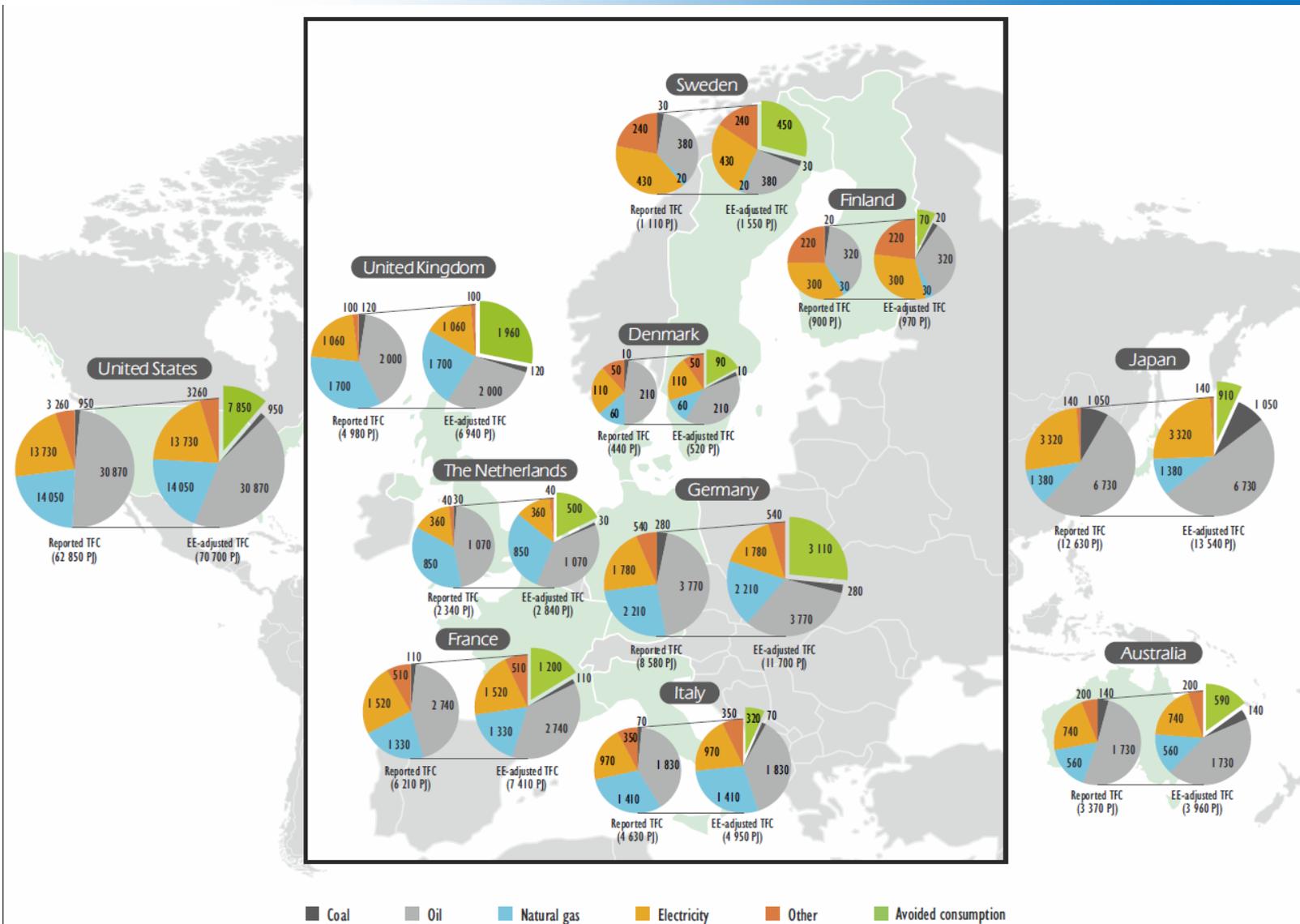
# Supply vs 'virtual supply': Energy efficiency's contribution

TFC in 2014 in IEA countries with and without avoided consumption from efficiency investments since 1990



**Energy efficiency's contribution to meeting energy service demand is invisible in traditional charts**

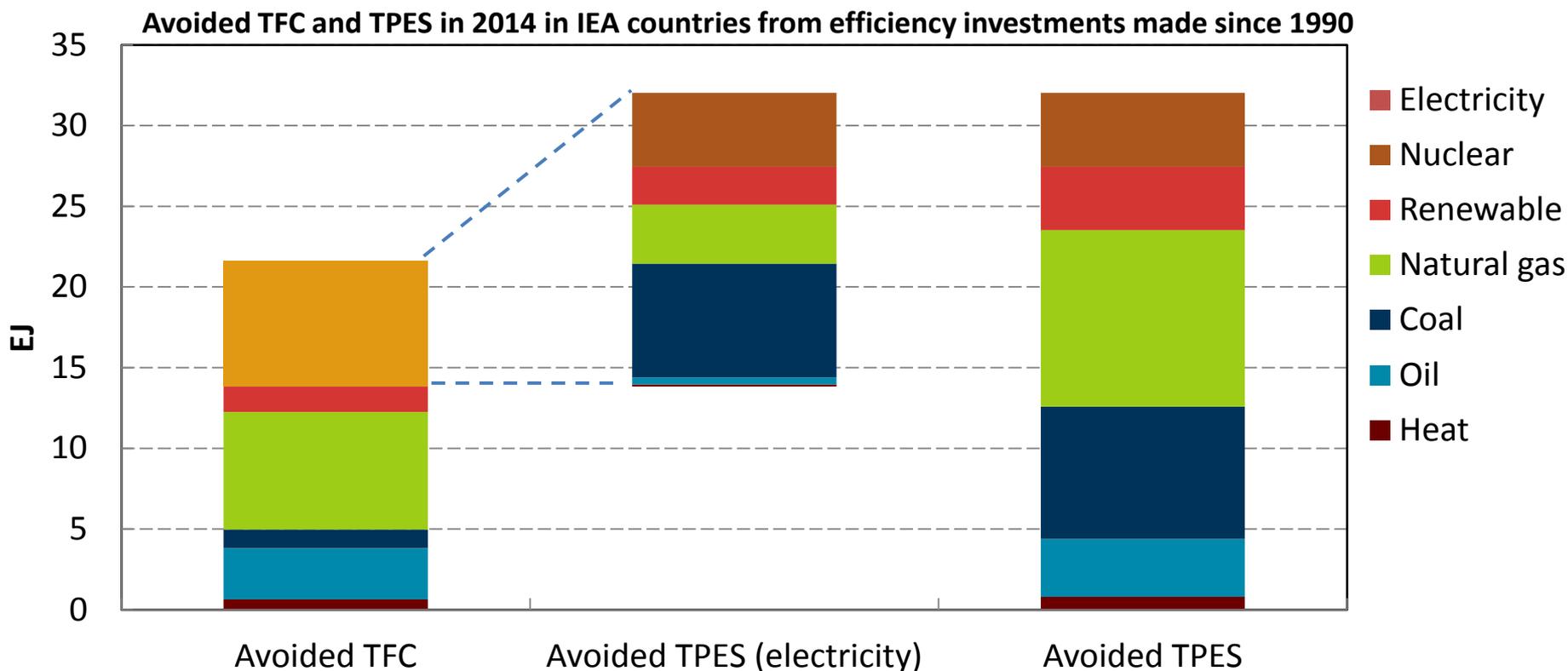
# EE's virtual supply generated in all IEA countries



This map is without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

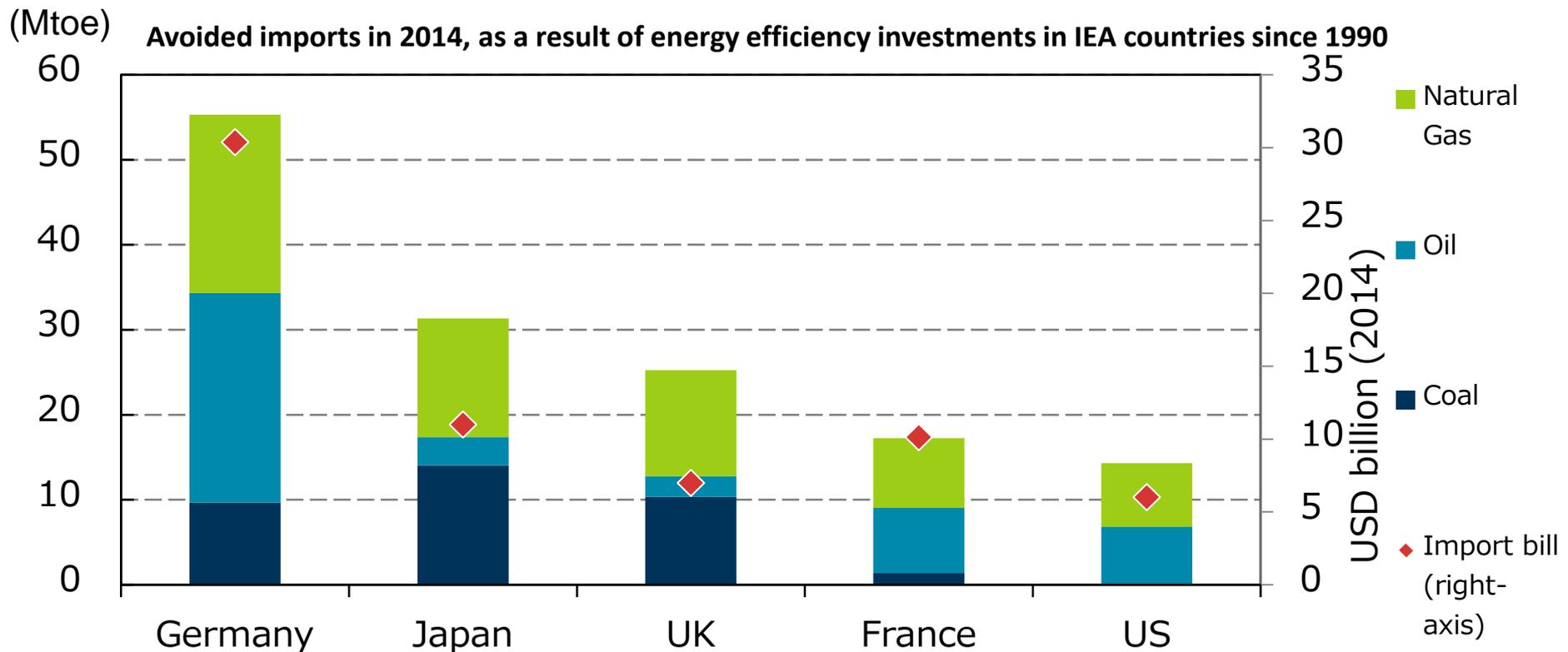
# From avoided end-use consumption to primary energy savings

- In 2014, avoided total primary energy supply generated by energy efficiency was 32 EJ (765 Mtoe)



# Efficiency's domestic production substitutes for fuel imports

- In 2014, IEA countries avoided primary energy imports totalling 190 Mtoe, saving USD 80 billion in energy import bills and improving trade balances

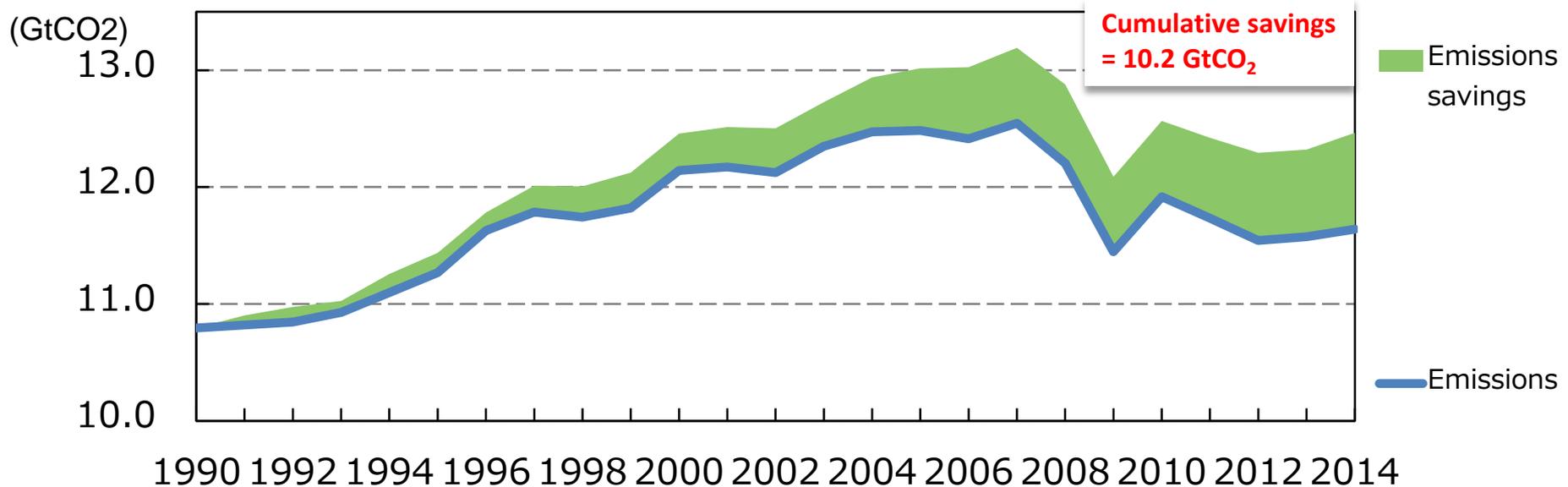


***Domestically produced, efficiency supports energy security***

# A clean energy source, efficiency reduces emissions

- Energy efficiency investments since 1990 have helped to reduce IEA country emissions to below 1996 levels
- Without energy efficiency investments, estimated IEA member country emissions would have been 870 Mt CO<sub>2</sub> higher in 2014

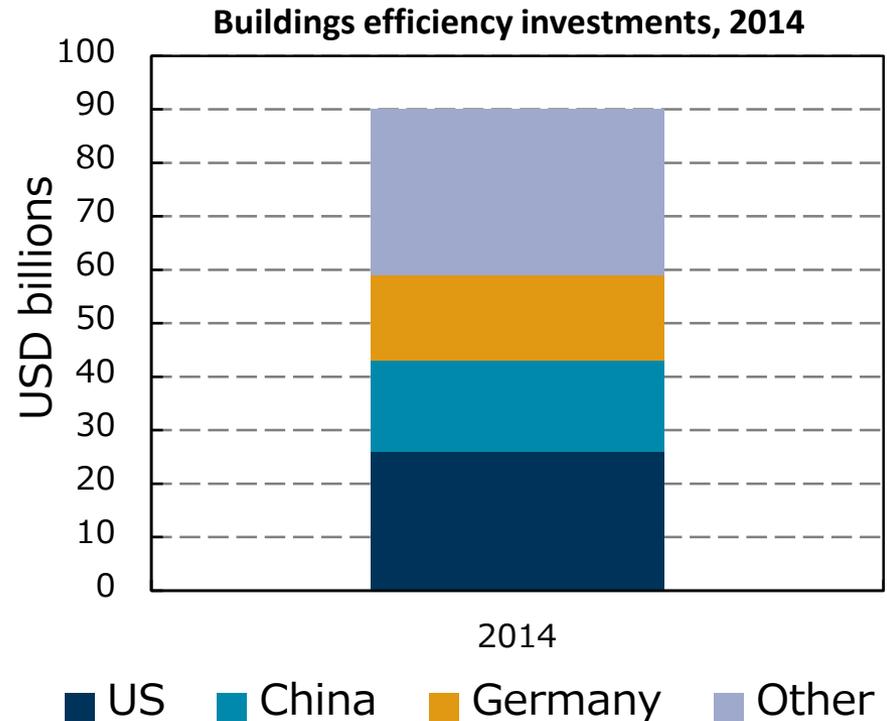
IEA emissions from fossil fuel combustion and emissions savings from energy efficiency investments since 1990



***Energy efficiency has helped to make the 2 degrees target more achievable by lowering emissions to date***

# Energy Efficiency in Buildings: Nearly a USD 100 billion market

- Energy Efficiency investment in buildings\* estimated at USD 90 billion with 2/3 in the US, China and Germany
- In the US, and elsewhere, building efficiency investments are growing faster than total buildings investments



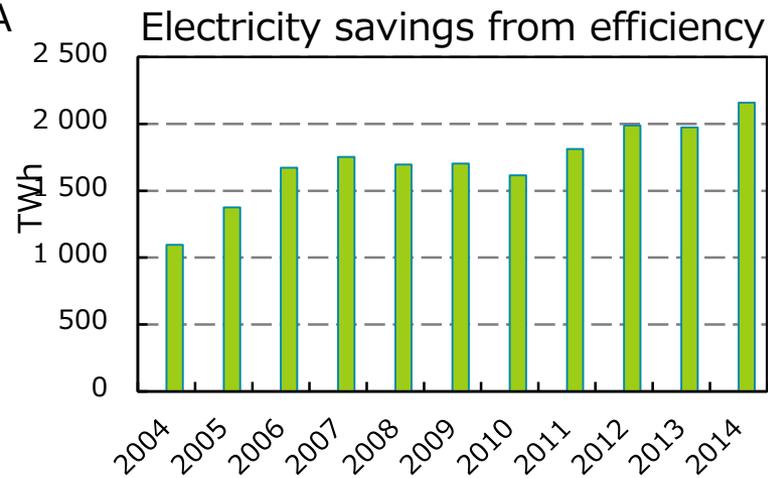
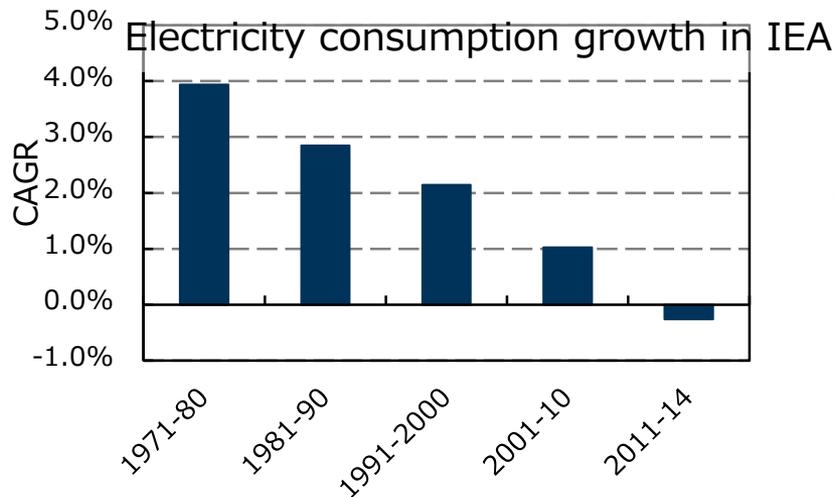
- **Current trends point to USD 120 billion by 2020**
- **But investment projections fall far short of estimated annual USD 215 billion needed to achieve the 2-Degree Scenario**

\*Includes insulation, HVAC systems, etc. but excludes appliances

# Energy Efficiency: flattening electricity consumption in IEA countries

- Electricity consumption in IEA countries declined by 2% since 2010; without efficiency, electricity consumption would still be growing
- Energy efficiency has enabled businesses and households to meet their energy service demands with 2 200 fewer TWh of generation

Electricity consumption in IEA member countries and energy efficiency savings (from investments since 1990)

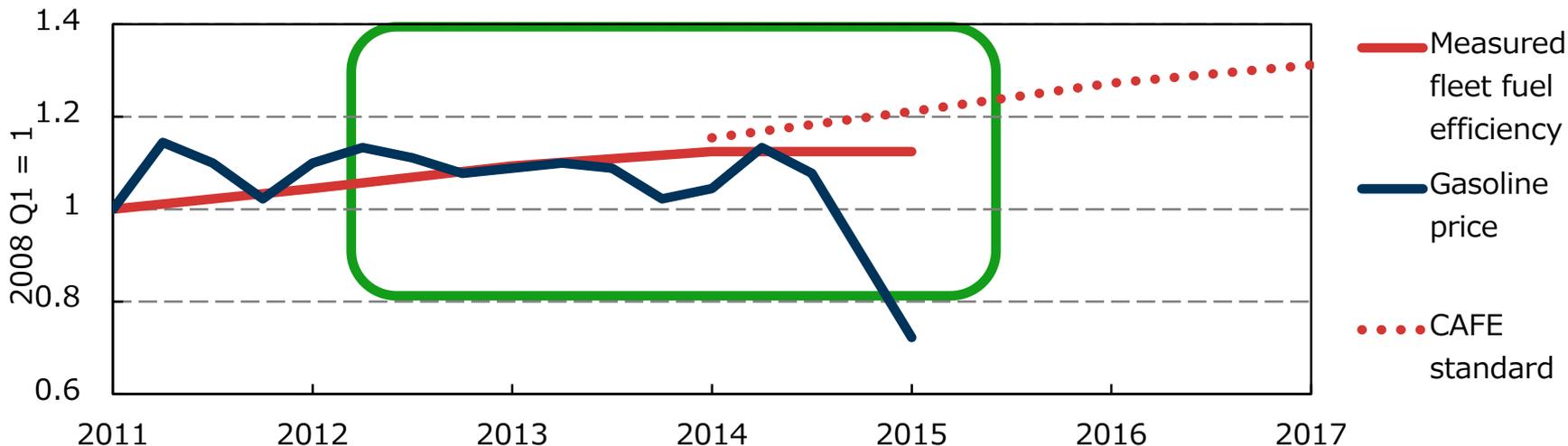


- **Low growth is pushing various energy utilities to shift from traditional generation to sale of energy efficiency services**
- **Energy efficiency is facilitating the achievement of renewables targets by decreasing the amount of additional GWh required**

# Maintaining momentum in a low oil price environment

- **Strong policy drivers to insulate EE investments:**
  - The EU Energy Efficiency Directive, the US Clean Power Plan
  - INDCs submitted to the UNFCCC should all drive investment
  - Consumption subsidies have been cut in various jurisdictions dampening drop in consumer prices
- **Uneven short-term impacts on demand**

Indices of new US LDV fuel economy performance, CAFE standard and unleaded gasoline prices



***Continued low oil prices could ultimately weaken support***

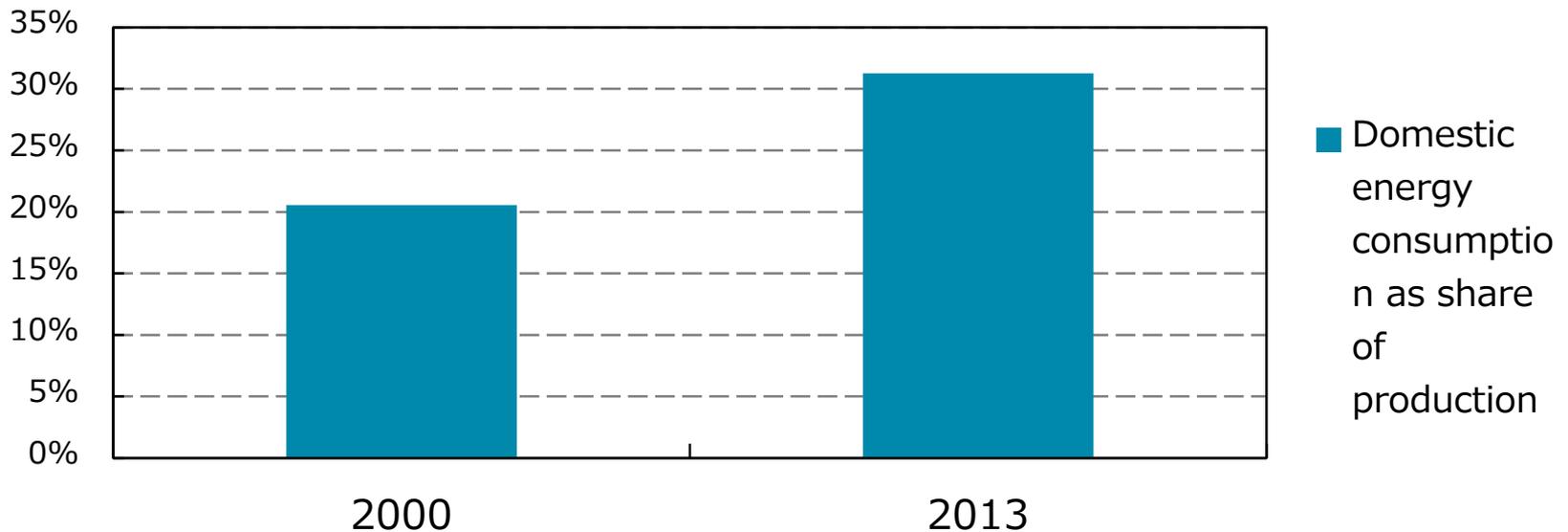
# Market Profiles highlight the diversity of energy efficiency markets

Theme	Region	Findings
Energy exporters	Russia	<i>Energy exporters increasingly looking to efficiency to boost export volumes</i>
	Saudi Arabia	
Sub-national government	Tokyo	<i>Cities and sub-national governments major enablers of energy efficiency markets</i>  Eager to capitalize on multiple benefits of energy efficiency
	Seoul	
	Paris	
	Massachusetts	
Latin America	Mexico	<i>Energy efficiency an important supporter of various economic and social development objectives</i>
	Brazil	
IEA Member	United Kingdom	Using efficiency to adjust to net-energy importer status

# In Saudi Arabia, energy efficiency is helping to increase export revenues

- Domestic energy consumption has nearly doubled since 2000 reducing share of energy production going to exports
- Saudi Arabia has implemented efficiency standards on key sources of domestic energy demand including vehicles and air conditioners :

Saudi Arabia - Domestic energy consumption as share of total production: 2000-2013



***Air conditioner standards alone are targeted to improve efficiency by 35%: this would save 47 million barrels of oil, which could increase export revenues by around USD 2.4 billion***

# Tokyo: an energy efficiency star

- Tokyo addressing broad range of sectors (transport, buildings) with broad range of instruments (regulations, cap&trade)
- Cap & Trade has enabled targeted commercial buildings to reduce energy consumption by 7% since 2010
- Additional measures targeting residential buildings have helped decrease energy intensity by 7% over the 2005-2013 period
- Markets are responding: mixed housing and transport development creating systemic efficiency improvements
  - High-density, transit connected housing developments improving building efficiency and using low energy transit modes
  - Tokyo's rail system added 4.9 billion pkm between 2004-09 while total transport energy use down 35% between 2002 and 2012



[http://www.japan-guide.com/blog/schauwecker/g/121009\\_outside\\_04.jpg](http://www.japan-guide.com/blog/schauwecker/g/121009_outside_04.jpg)

# Seoul: Using efficiency to reduce generation needs

- Seoul has adopted “One-Less Nuclear Plant” plan to reduce energy consumption equivalent of one nuclear plant (2 Mtoe)



<http://www.pennenergy.com/articles/pe/2013/10/>



- Plan has retrofit 2 267 buildings – enabled market with low interest financing of up to USD 2 million per project
- Seoul’s lighting plan to go 100% LED replacing 2.2 million security and street lights

<https://upload.wikimedia.org/wikipedia/commons/>

# Thank you



**Available as of Oct 8<sup>th</sup> to download for free at:**

[http://www.iea.org/bookshop/709-Energy\\_Efficiency\\_Market\\_Report\\_2015](http://www.iea.org/bookshop/709-Energy_Efficiency_Market_Report_2015)