World Energy Outlook 2017

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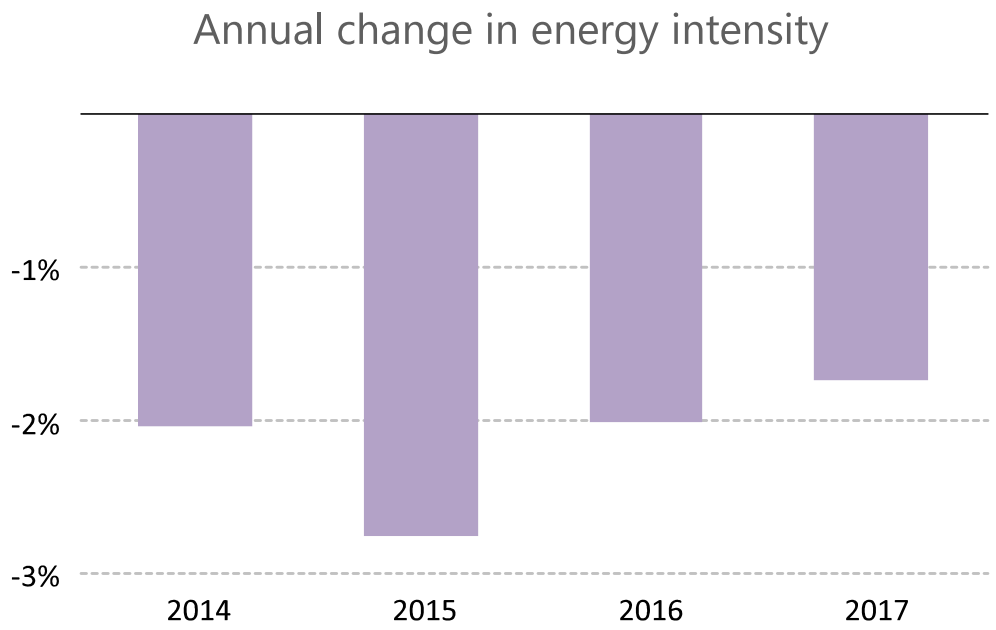
Energy Efficiency Training Week

Paris,14 May 2018

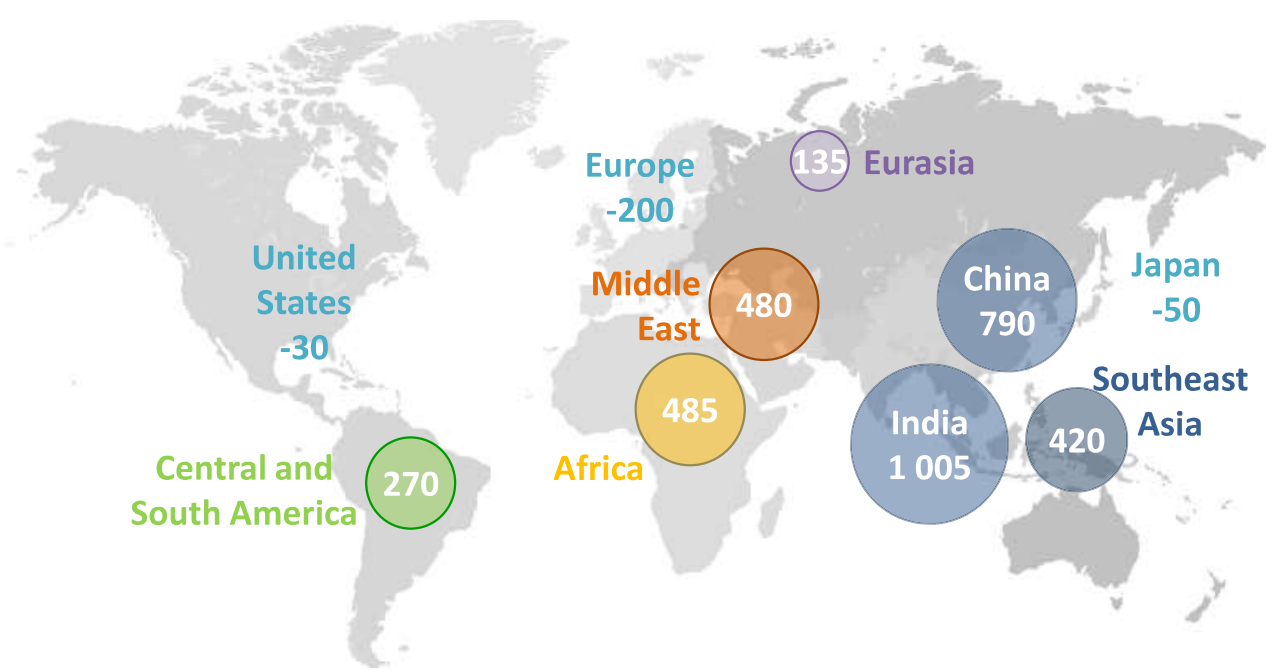
Energy efficiency slowing down?

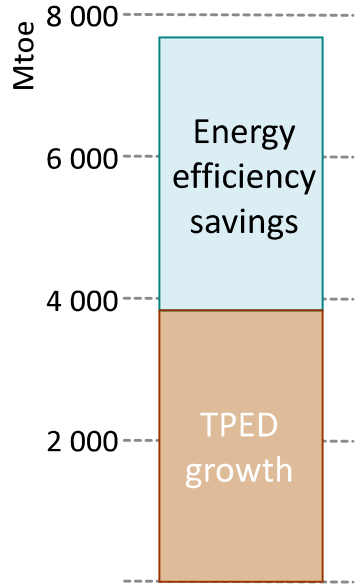


Gains in global energy efficiency slowed down dramatically in 2017, because of weaker improvement in efficiency policy coverage and stringency as well as lower energy prices.

India takes the lead, as China energy growth slows

Change in energy demand, 2016-40 (Mtoe)

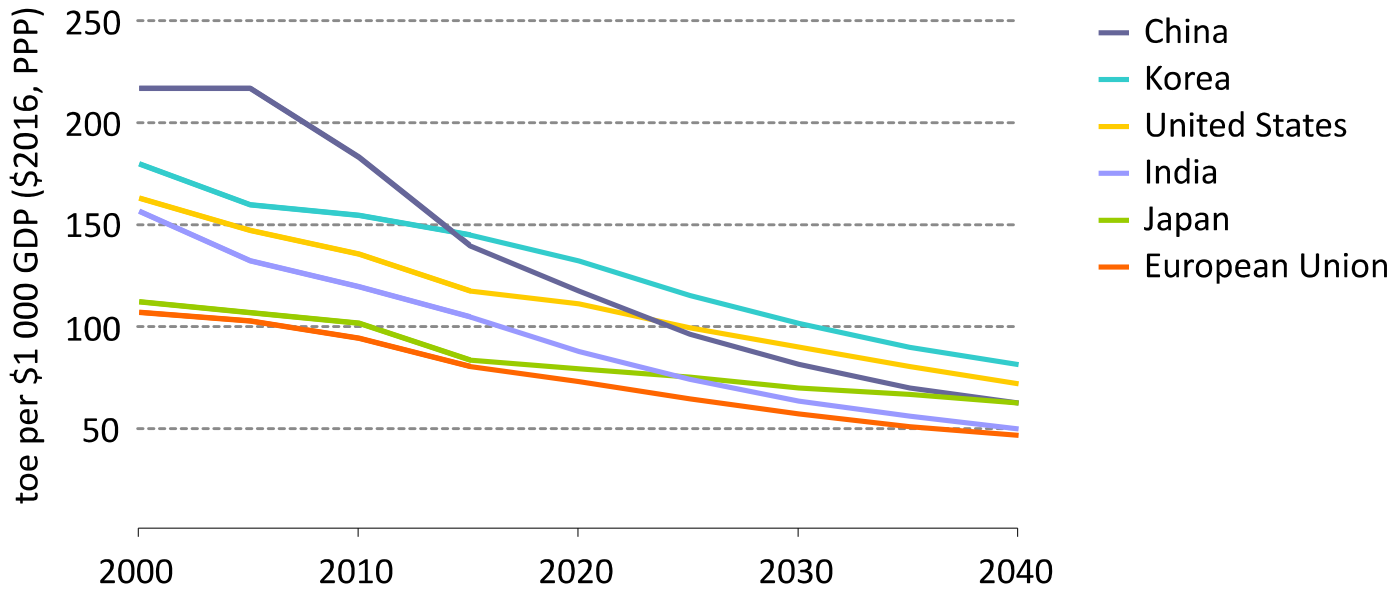




Old ways of understanding the world of energy are losing value as countries change roles: the Middle East is fast becoming a major energy consumer & the United States a major exporter

Energy intensity is steadily falling down

Primary energy demand per unit of GDP in selected regions, in the New Policies Scenario



The global energy intensity decreases by 2.3%/year to 2040, falling short of the SDG target by 2030; China witnesses the fastest decline in energy intensity due to structural changes

A world in motion..

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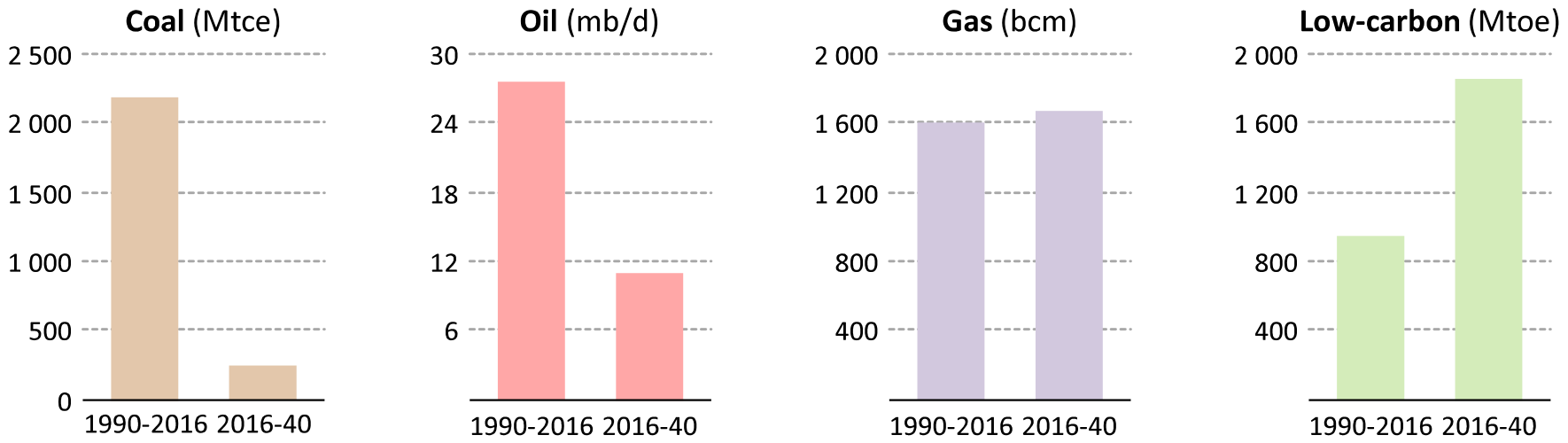
Change in world energy demand by fuel



Low-carbon sources & natural gas meet 85% of the increase in global demand: China's switch to a new economic model & a cleaner energy mix drives global trends

Oil use from passenger cars peaks due to efficiency

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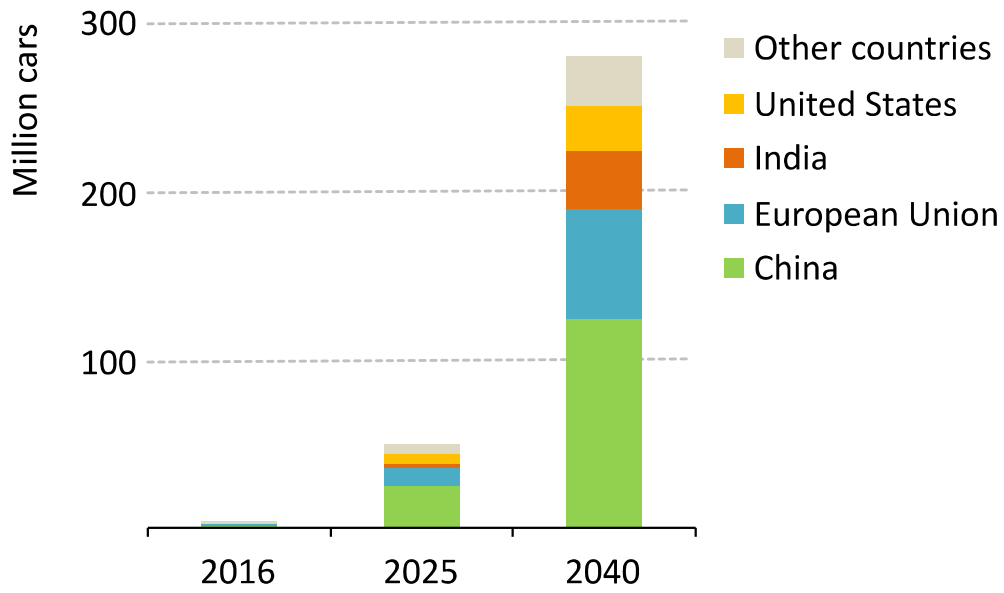
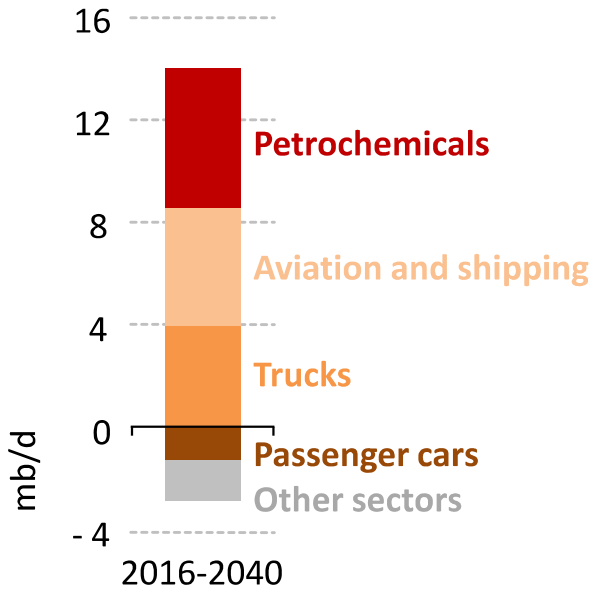
Electric car fleet



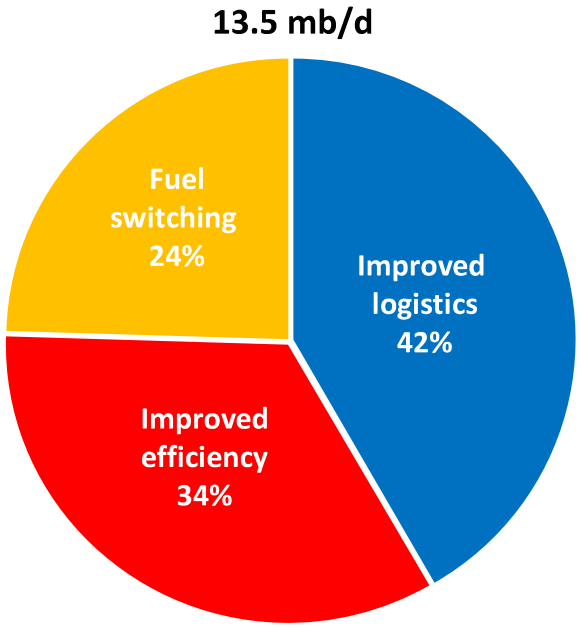
Change in global oil demand



Electric cars displace 2.5 mb/d of oil demand by 2040, but efforts to improve vehicle efficiency save 12 mb/d of potential additional demand

Tapping into the energy efficiency potential of trucks

Fuel demand saving in the Modern Truck Scenario relative to the Reference Scenario, 2050



Trucks are the fastest growing source of global oil demand today
Modernising trucks and systems operations could reduce fuel demand by 50% in 2050

The future is electrifying

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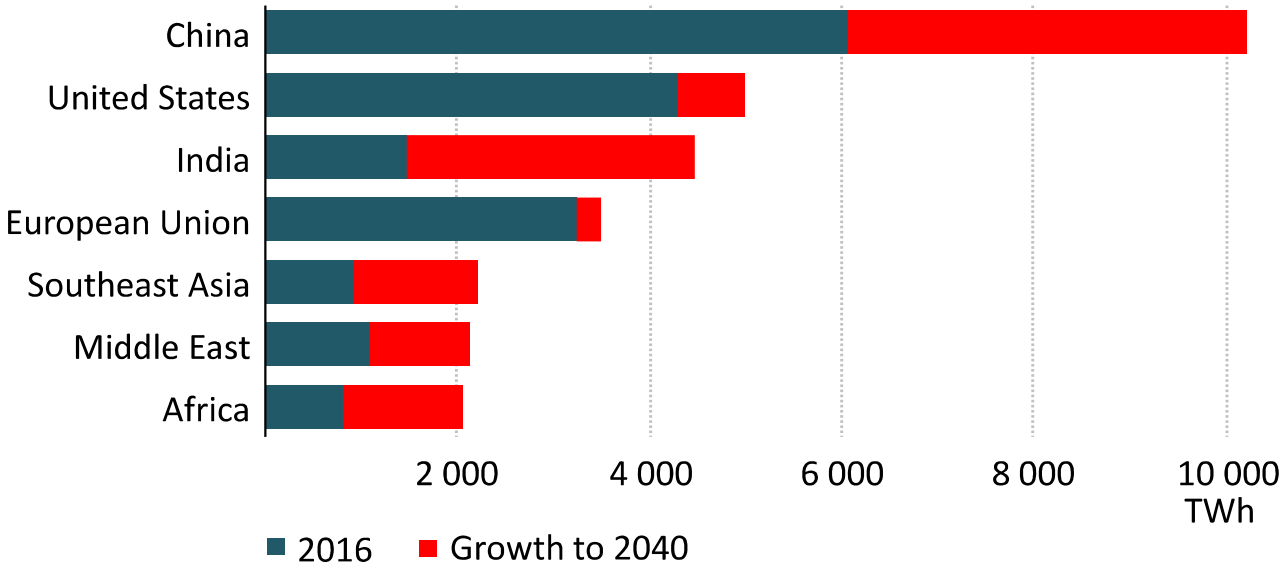
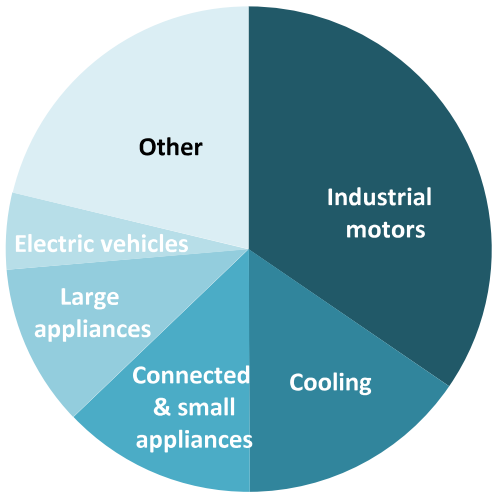
Electricity generation by selected region



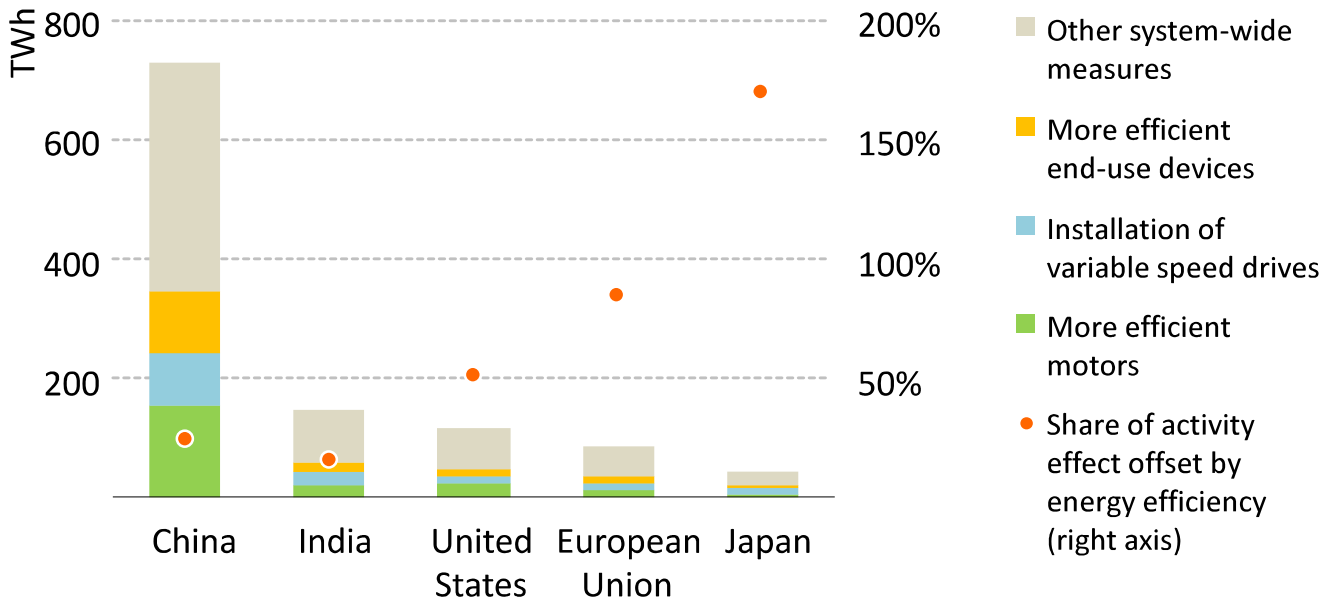
Sources of global electricity demand growth



India adds the equivalent of today's European Union to its electricity generation by 2040, while China adds the equivalent of today's United States

Motors drive industrial efficiency

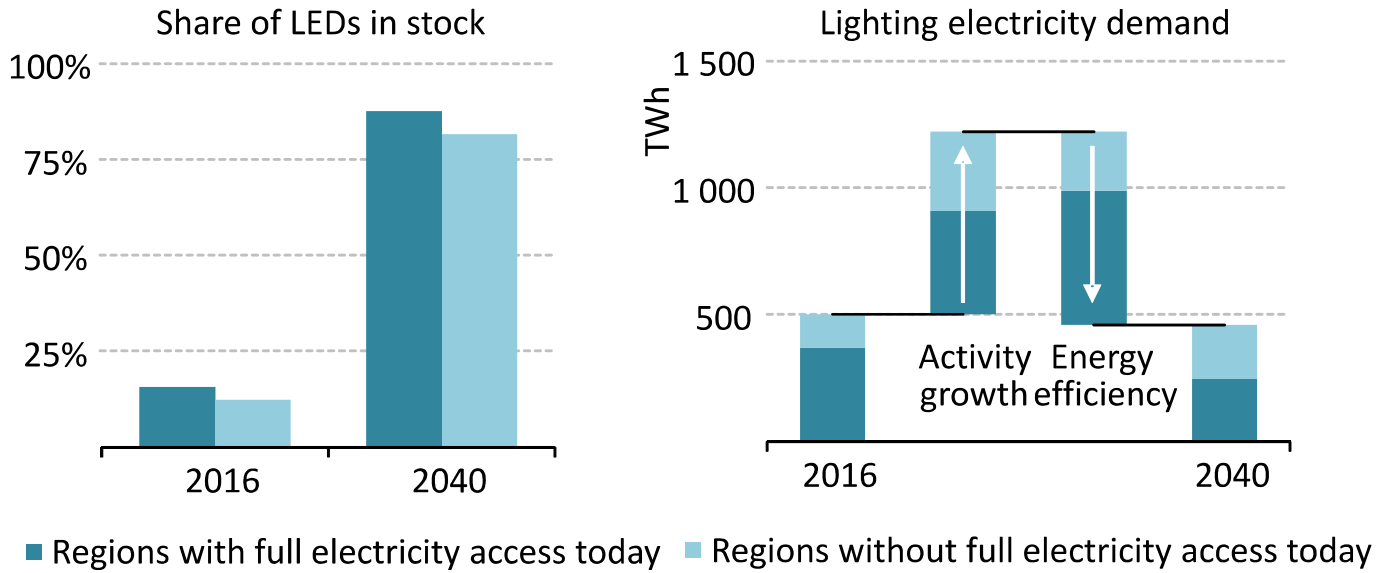
Avoided electricity use in industrial motor systems in the New Policies Scenario, 2040



Efficiency measures substantially reduce electricity demand growth for electric motor systems in industry, the biggest single consumer of electricity today

Lighting the way to improved energy efficiency in buildings

Residential LED stock and lighting electricity demand in the New Policies Scenario, 2016-2040



Building on recent momentum, LEDs make up most of the lighting stock in 2040, and offset the additional lighting service electricity demand

A new strategy for energy & sustainable development

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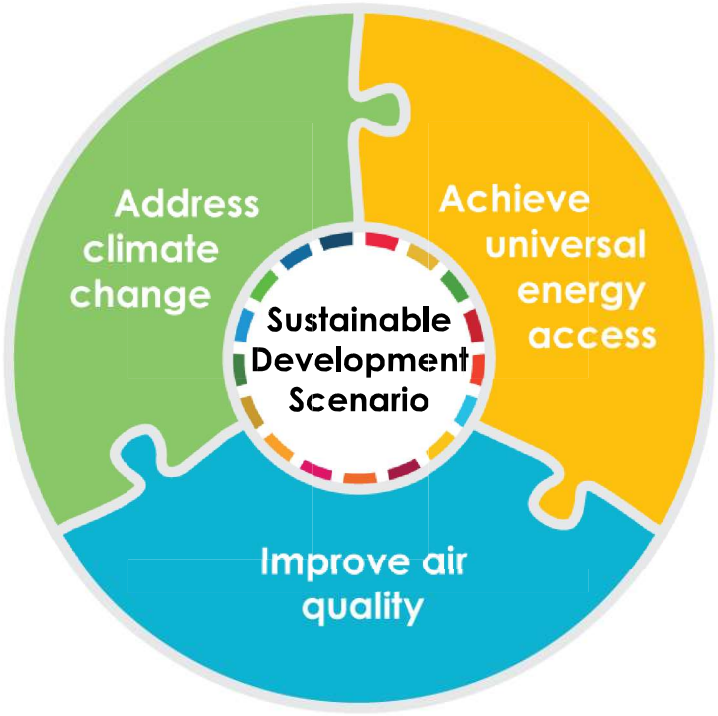

2 times more efficient than today

3 250 GW global solar PV capacity

875 million electric vehicles

580 bcm additional gas demand

The Sustainable Development Scenario reduces CO_2 emissions in line with the objectives of the Paris Agreement, while also tackling air pollution and achieving universal energy access

Achieving access for all by 2030

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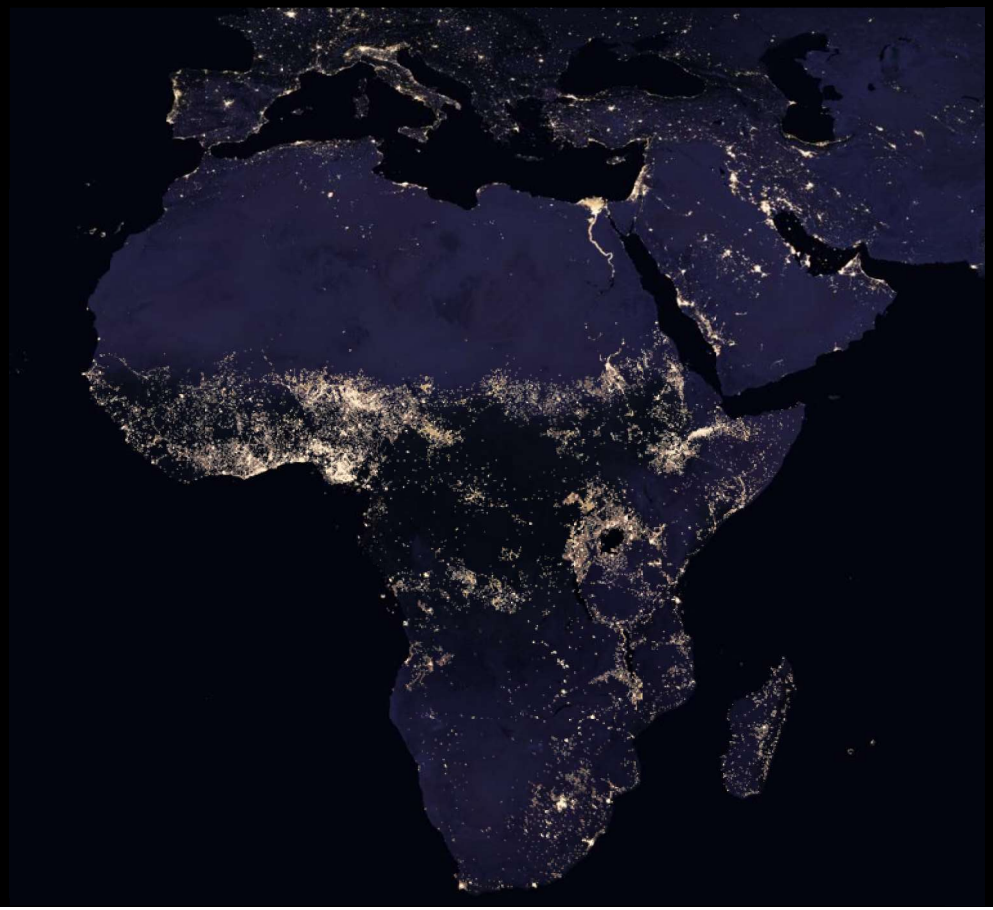

Changing the way energy is used and produced

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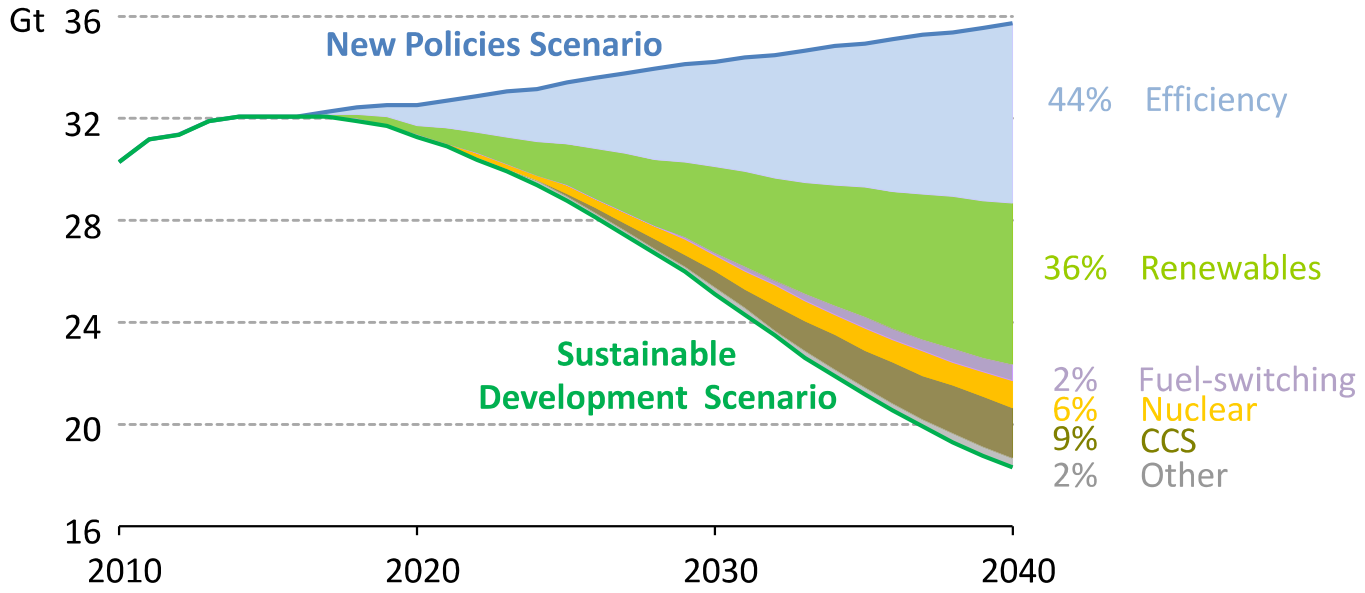
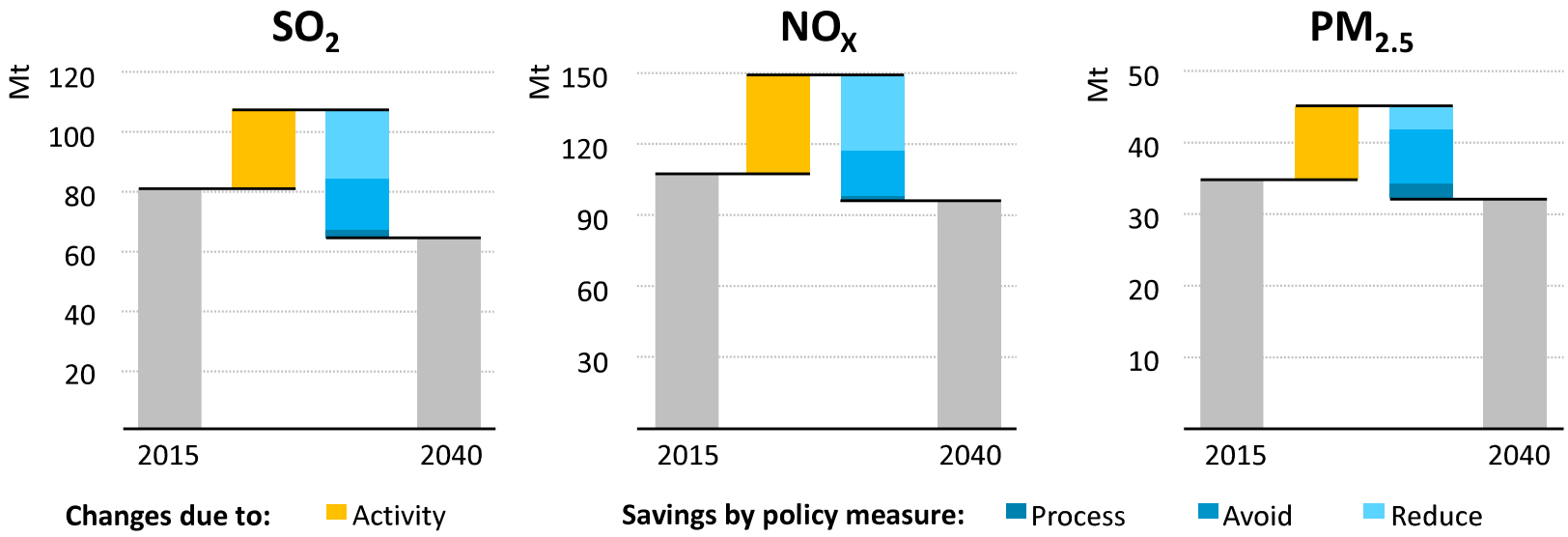
Global CO_2 emissions in the New Policies and Sustainable Development Scenarios



Further improving energy efficiency accounts for 44% of the cumulative CO_2 emissions savings in the Sustainable Development Scenario

Energy efficiency: part of the air pollution solution

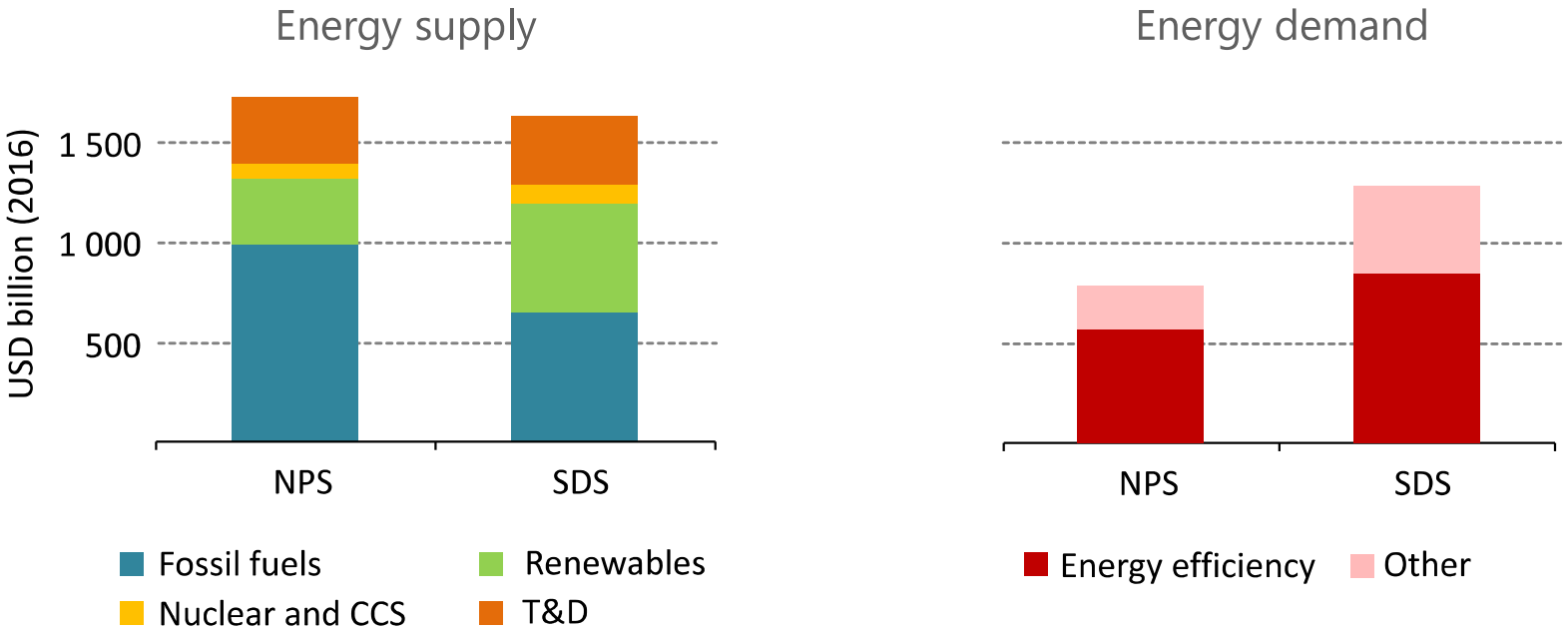
Air pollutant emissions from the energy sector and savings by policy type



Air pollution, mostly due to fuel combustion, causes 6.5 million premature deaths
Energy efficiency policies contribute to avoid emissions and cut health impact

Sustainable investment needs

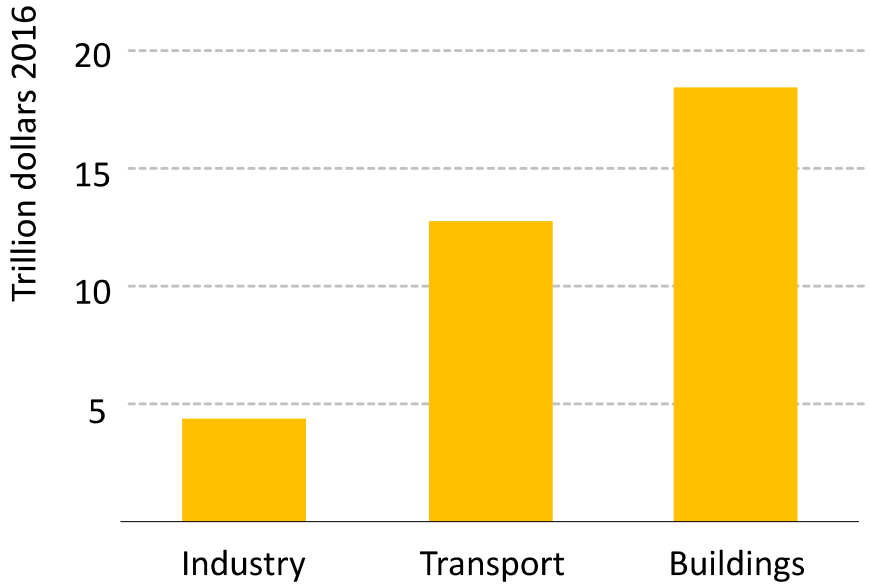
Average annual investment in the New Policies and Sustainable Development Scenarios, 2017-2040



The Sustainable Development Scenario requires 15% additional investment to 2040; two-thirds of energy supply investment are needed for electricity generation & networks

Sustainable investment needs

Cumulative investments in energy efficiency by sector in the 66% 2°C Scenario, 2017-2050



Energy efficiency investment needs in end-use sectors are large, but are outweighed by fuel cost savings 3 to 1

Conclusions

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- Low energy prices and weaker improvements in energy efficiency policy saw a backwards step in energy efficiency improvement in 2017
- Going forward, implementation of current and announced policies would see energy efficiency be the first fuel in meeting energy demand growth to 2040
- Despite projected efficiency gains, in the New Policies Scenario, SDG goals on climate change, air pollution and universal access will not be met
- There are strong synergies between energy efficiency and renewable energy that can be harnessed to accelerate the clean energy transition
- The Sustainable Development Scenario requires an additional 15% of investment, with a major step up in energy efficiency investment in end-use sectors


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