



The Future of Cooling

Opportunities for energy-efficient air conditioning

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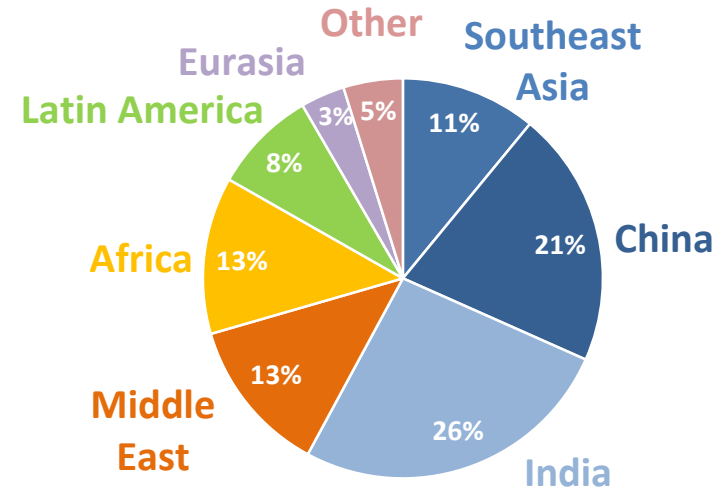
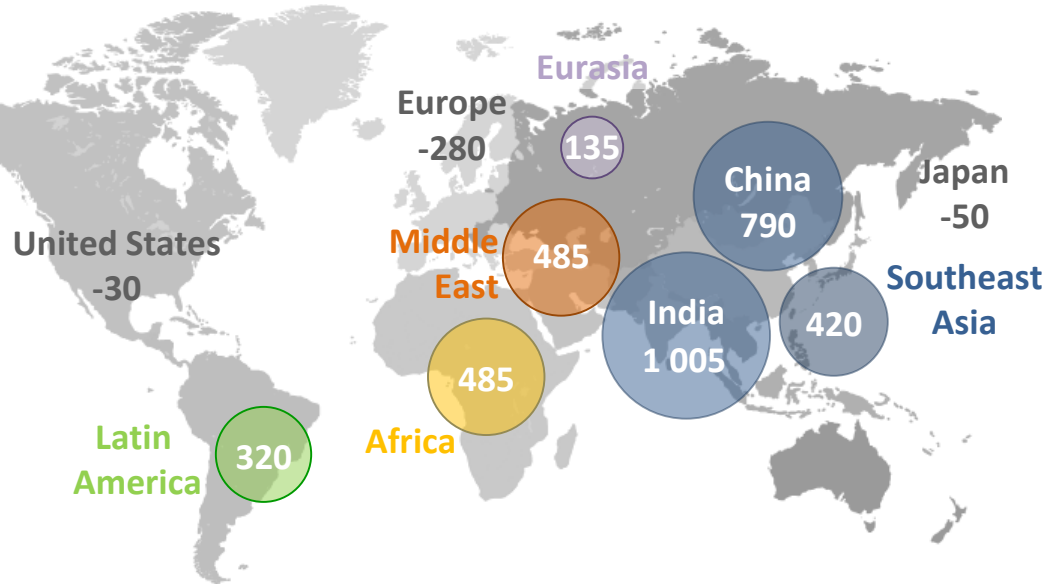
Energy Efficiency Division



Asia is becoming the centre of the global energy system

Change in primary energy demand to 2040 (Mtoe)

Share of global growth 2016-2040

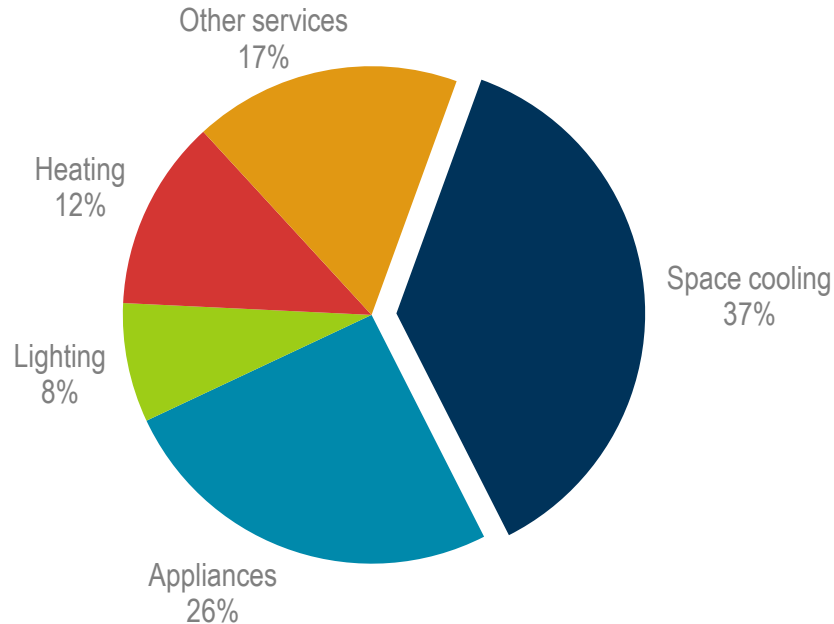


Source: World Energy Outlook Special Report: Southeast Asia Energy Outlook 2017

Southeast Asia, India and China are the engine of future energy demand growth, together accounting for almost 60% of the global increase to 2040.

Cooling is outpacing all other energy end-uses in buildings

Share of final electricity demand growth in buildings to 2050

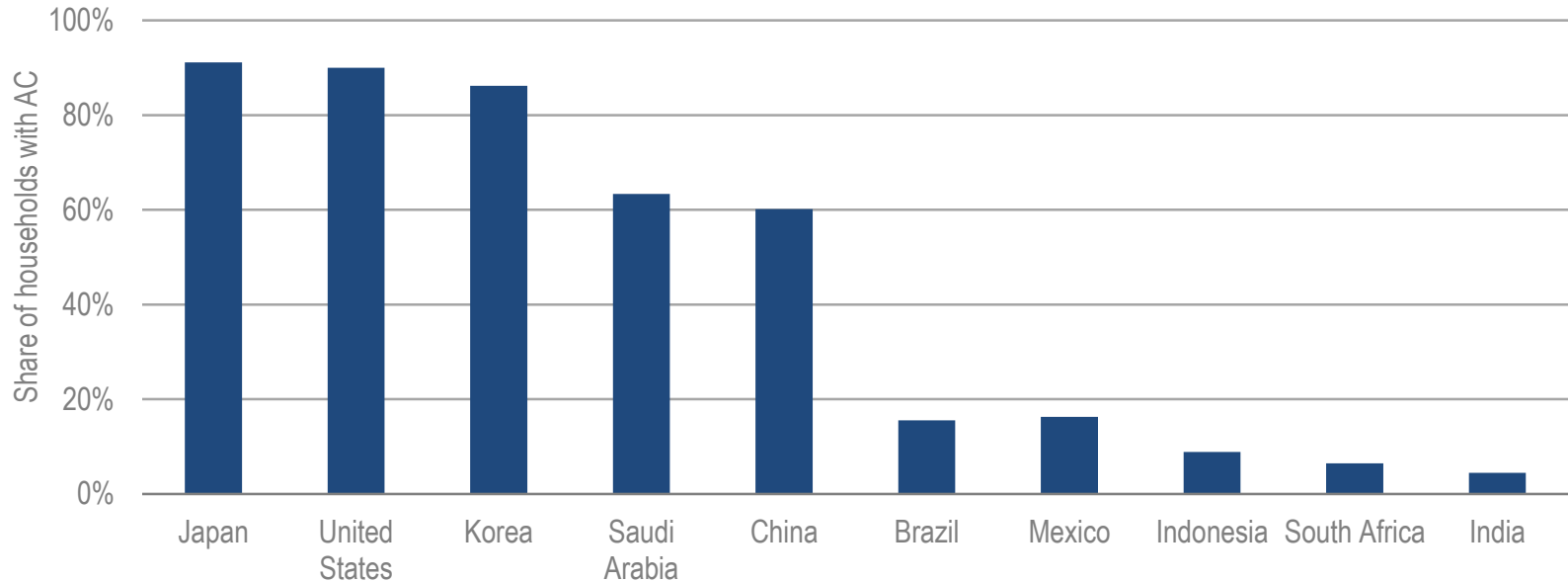


Without action to address energy efficiency, energy demand for space cooling will consume nearly 40% of electricity growth in buildings and more than 20% of global electricity growth.

- Global population growth is strongest in hot countries, where keeping cool is important
- As they become able to afford them, billions more people will buy and use air conditioners
- The potential implications for energy systems are huge
- The new report outlines those implications, and also shows how, led by energy efficiency, the future of space cooling can be more sustainable

Most homes in hot countries have not yet purchased their first AC

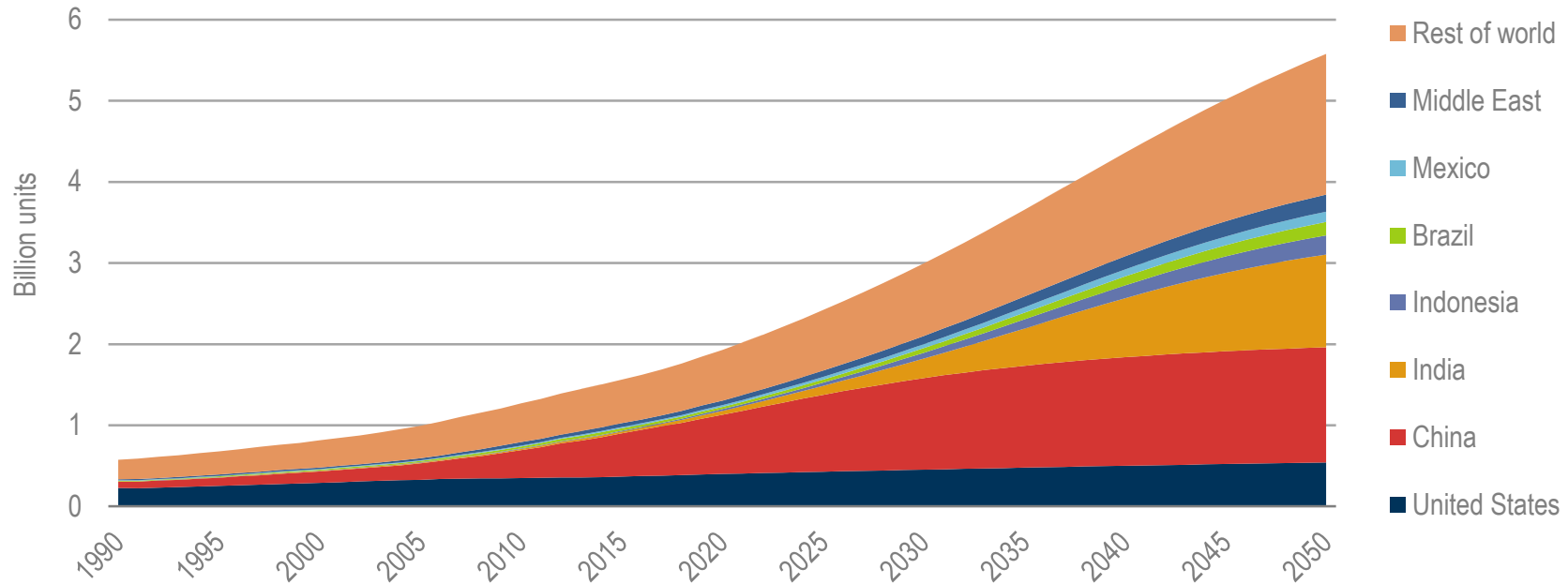
Percentage of households that have AC today



Air conditioning today is concentrated in a small number of countries, but AC sales are rising rapidly in emerging economies.

The world faces a 'cold crunch'

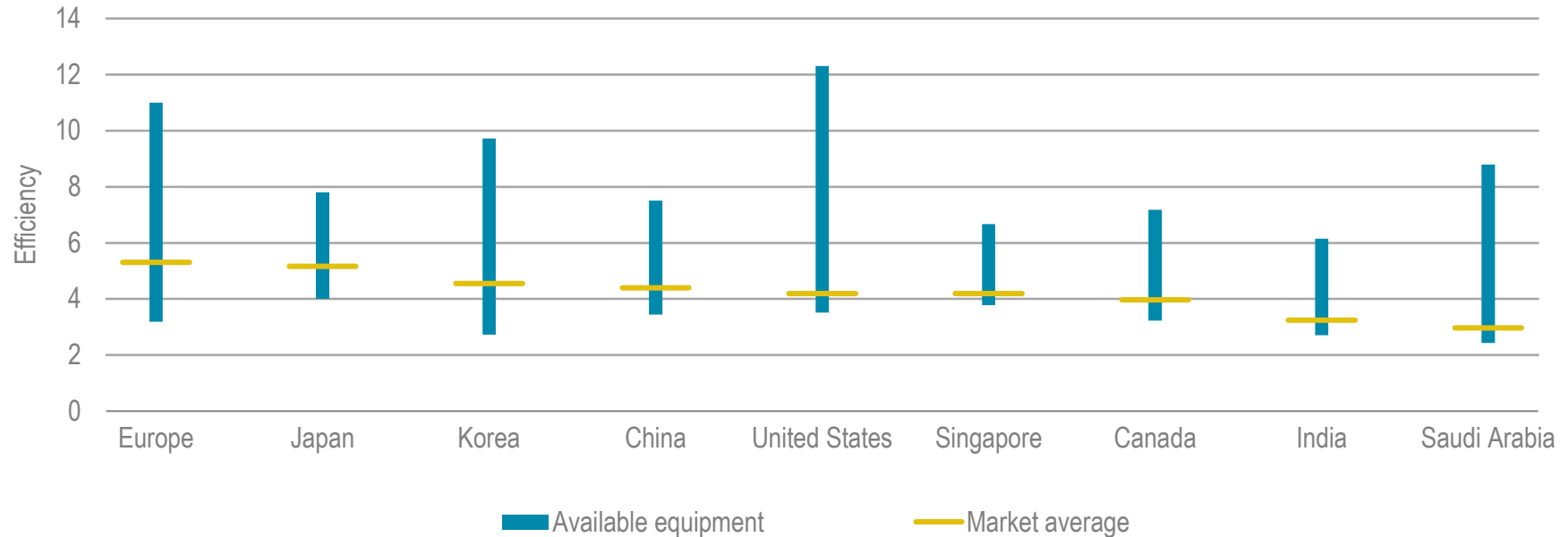
Global air conditioner stock



**By 2050, around 2/3 of the world's households could have an air conditioner
China, India and Indonesia would together account for half of the total number**

Consumers are not buying the most efficient ACs

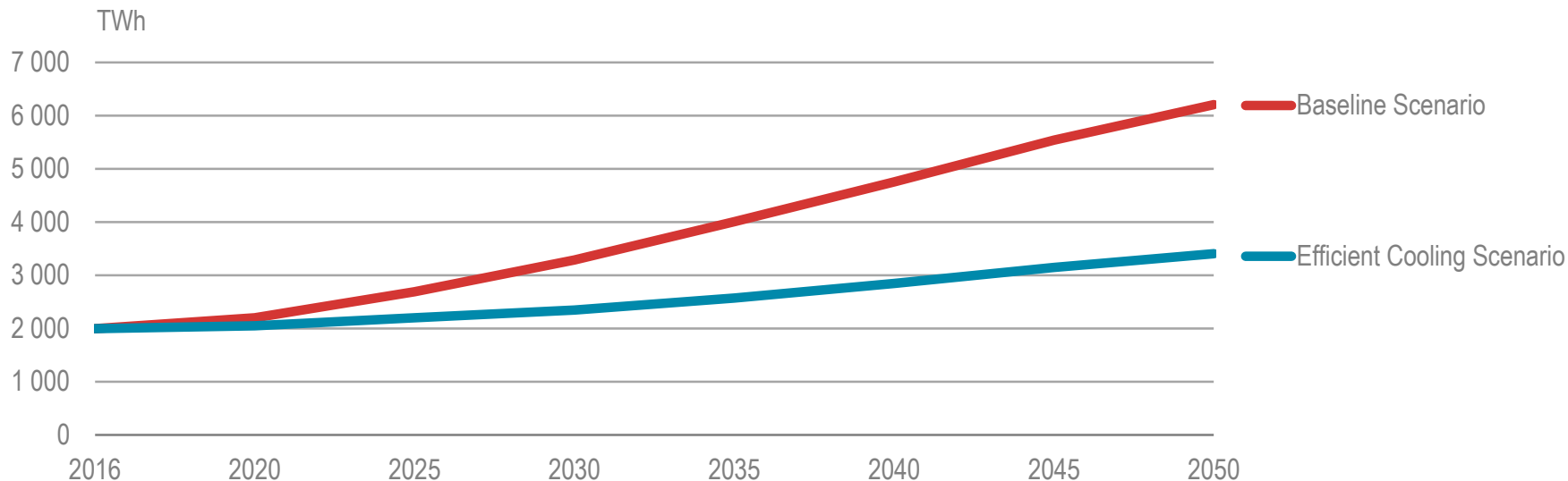
Energy performance of air conditioners already available in markets today



The average efficiency of air conditioners sold today is less than half of what is typically available on the shelves – and one third of best available technology

Efficient ACs can halve future energy demand

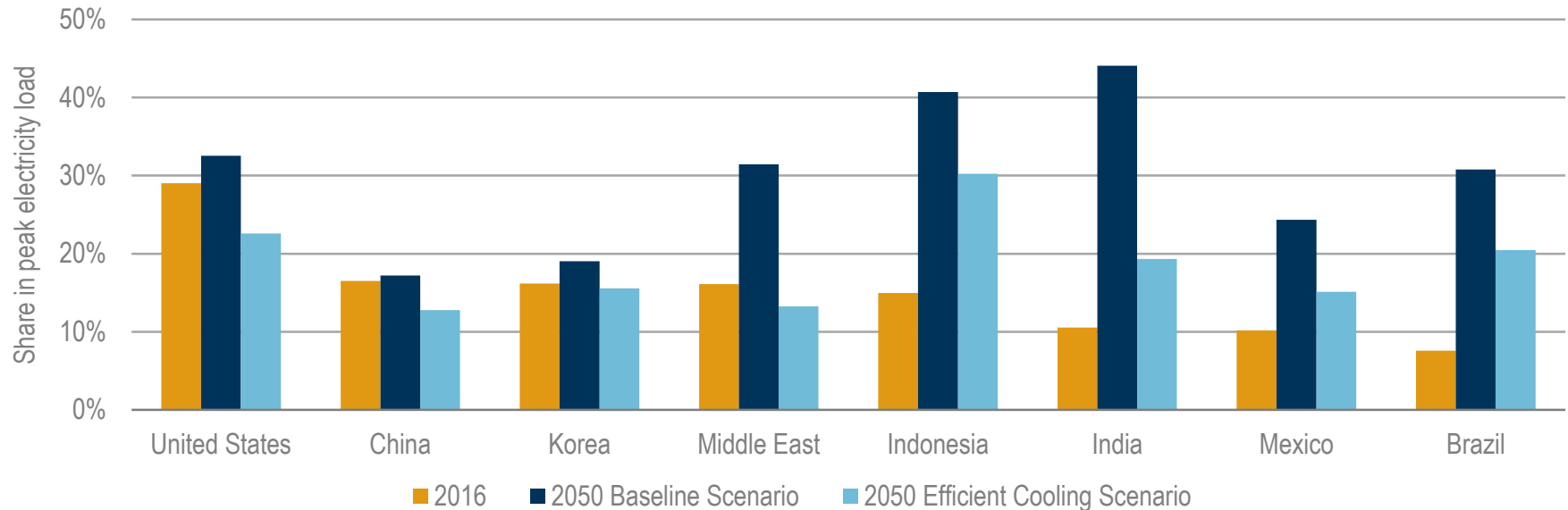
Space cooling energy demand growth and savings potential



Our Efficient Cooling Scenario shows that effective policies can double average AC efficiency, reducing cooling electricity demand by more than all the electricity consumed by the European Union today

Cooling is a key issue for peak electricity demand

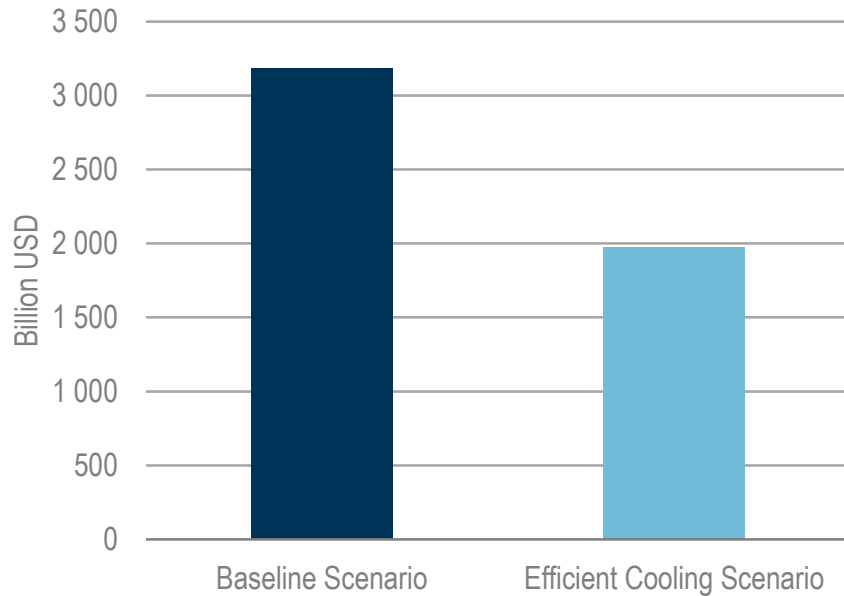
Share of cooling in electricity system peak loads



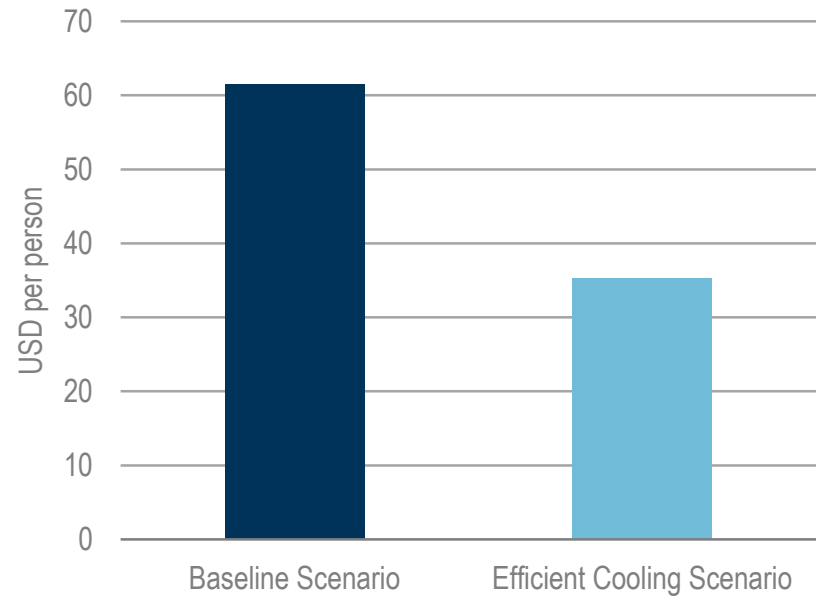
Cooling demand growth will drive up peak electricity loads everywhere, but efficient air conditioners can halve the impact.

Efficient ACs reduce investment, fuel and operating costs

Cumulative investments in power generation for space cooling to 2050



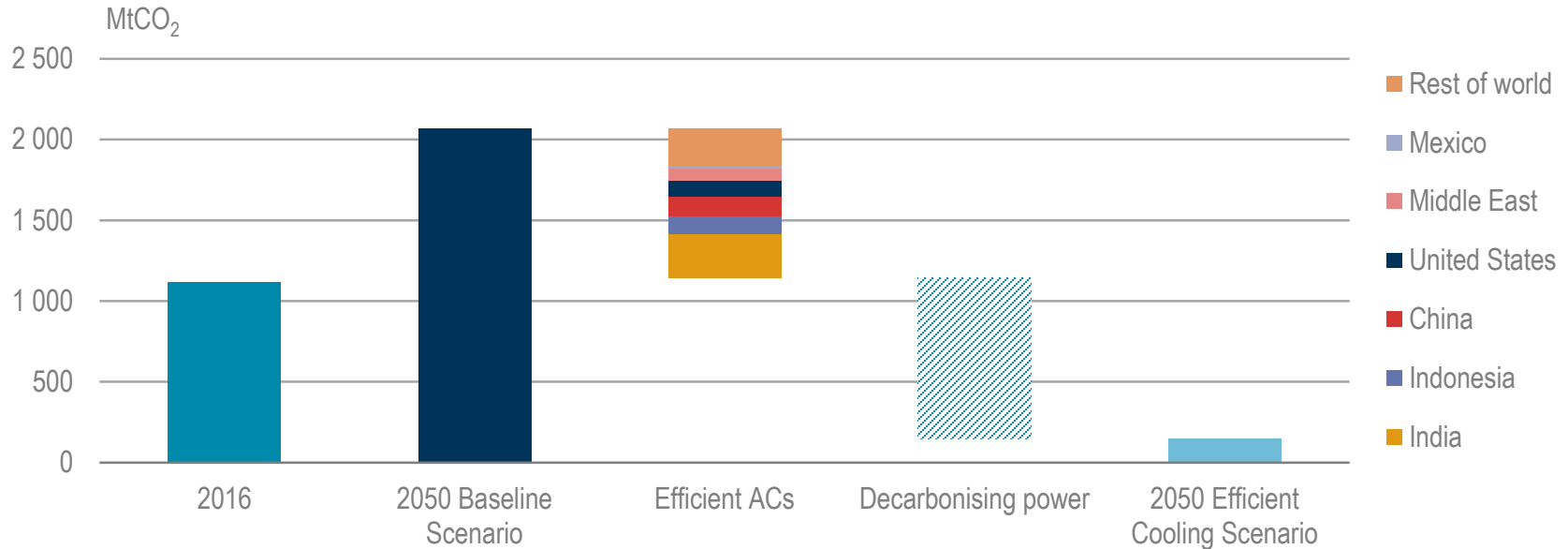
Global average electricity costs per capita for space cooling in 2050



The Efficient Cooling Scenario reduces investment and running costs by USD 3 trillion between now and 2050. Average cooling energy costs would be almost halved.

More efficient ACs will help cut emissions

Contribution of more efficient space cooling to reducing CO₂ emissions



More efficient ACs cut CO₂ emissions from space cooling in half and combined with cleaner power sources can radically reduce overall emissions. Local air pollution is also drastically cut.

- The global demand for AC cooling is set to soar and without firm policy interventions so will cooling-related energy demand.
- This risks huge negative impacts on electricity systems, costs and emissions
- The easiest, fastest and most effective action is to ensure all new ACs are very efficient.
- This will halve cooling energy demand growth and if coupled with efficient buildings, growth could be kept completely flat.
- The IEA is ready to support global action to ensure a sustainable cooling outcome.