

International Energy Agency

Sustainable Cooling

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The world is getting hotter

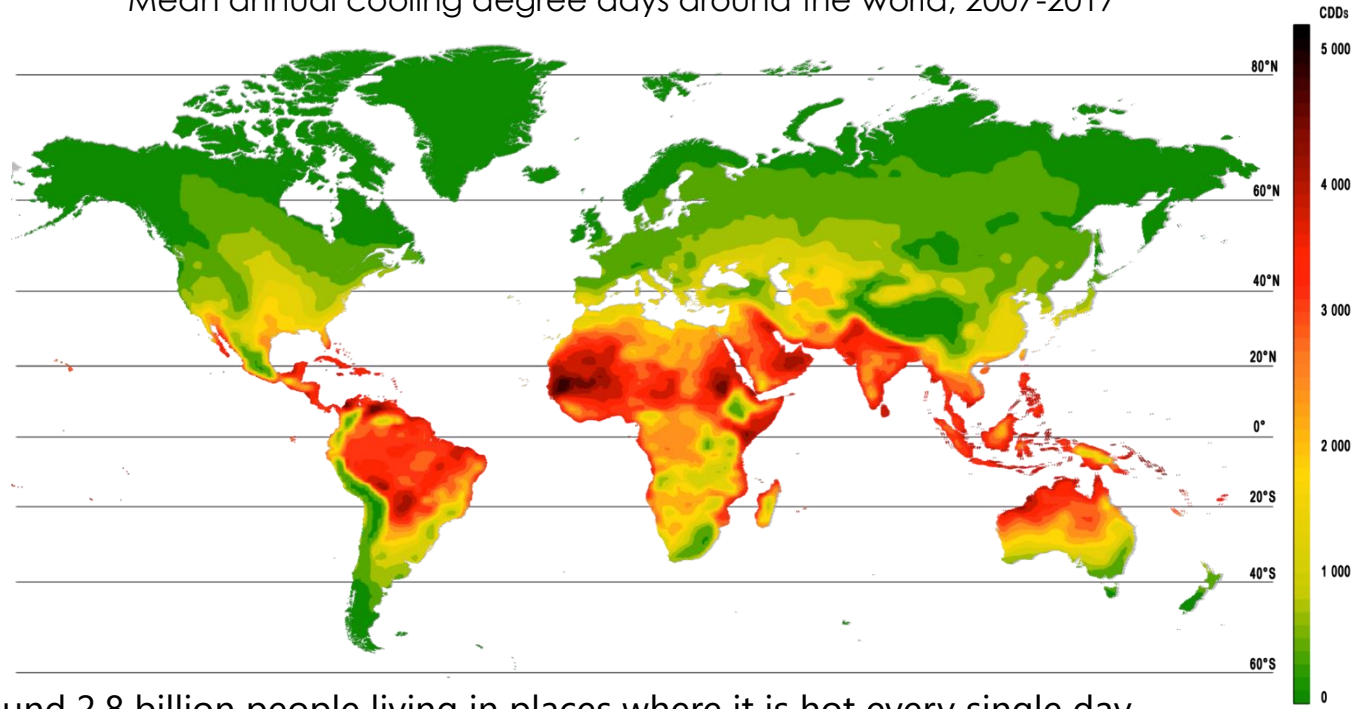


The need for cooling is growing – and with it demand for air conditioning.

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Access to cooling is a critical issue in some of the hottest places

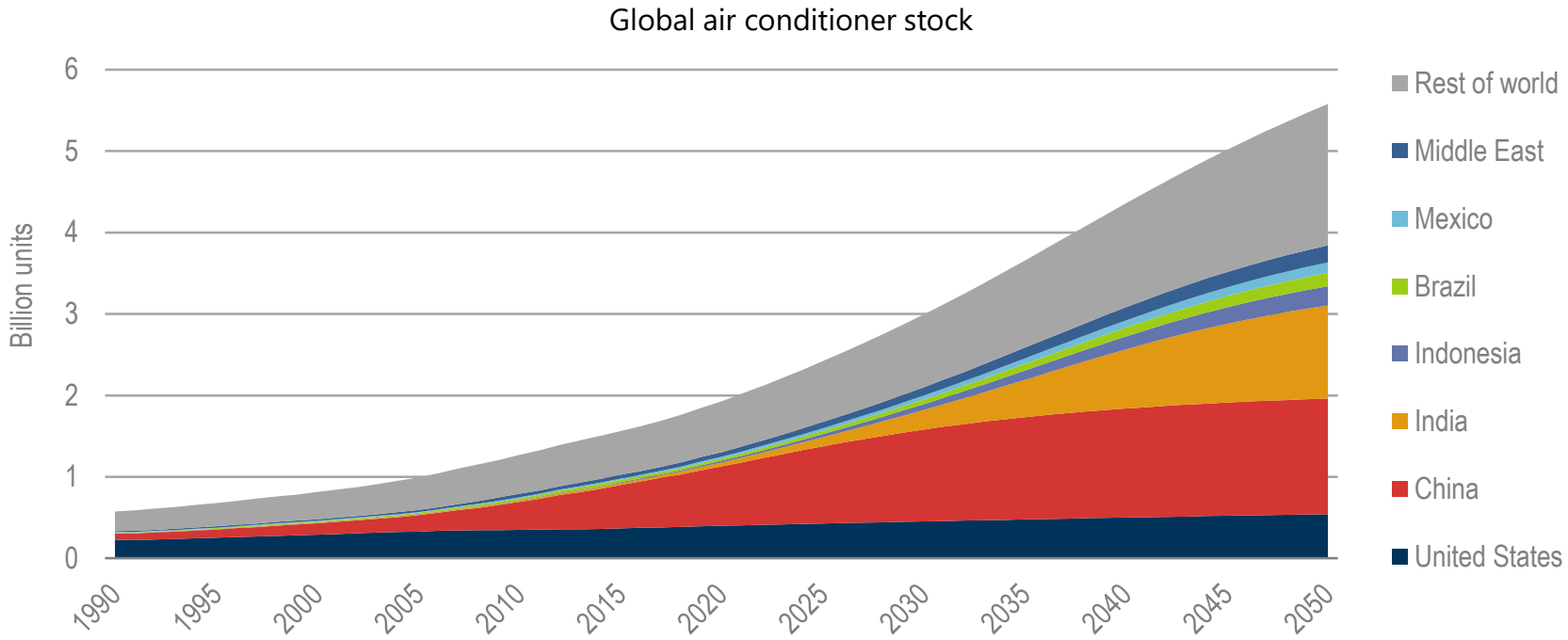
Mean annual cooling degree days around the world, 2007-2017



There are around 2.8 billion people living in places where it is hot every single day. Only 8% of them have an air conditioner today.

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Source: IEA The Future of Cooling 2018

Dramatic surge in ACs expected

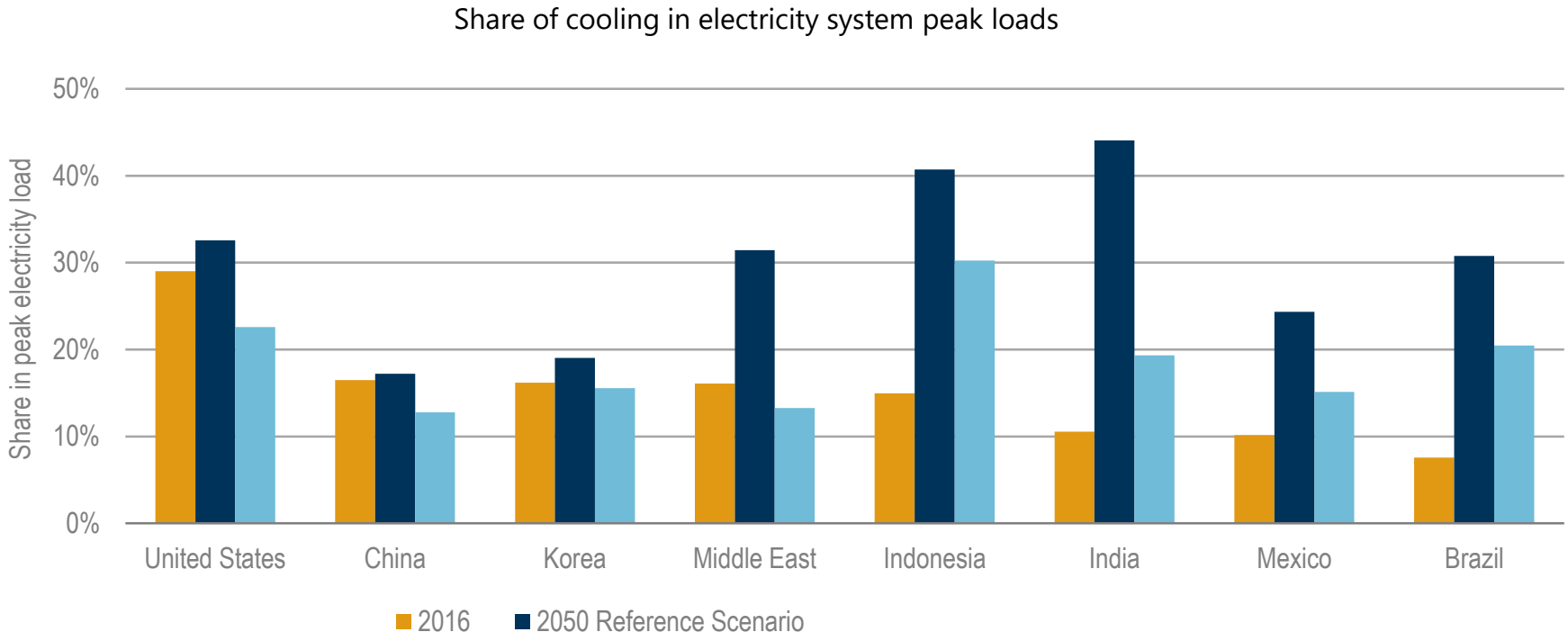


By 2050, around 2/3 of the world's households could have an air conditioner.
China, India and Indonesia will together account for half of the total number.

India - from 30 million to more than 1 billion units in 3 decades

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Space cooling demand has serious implications for grids

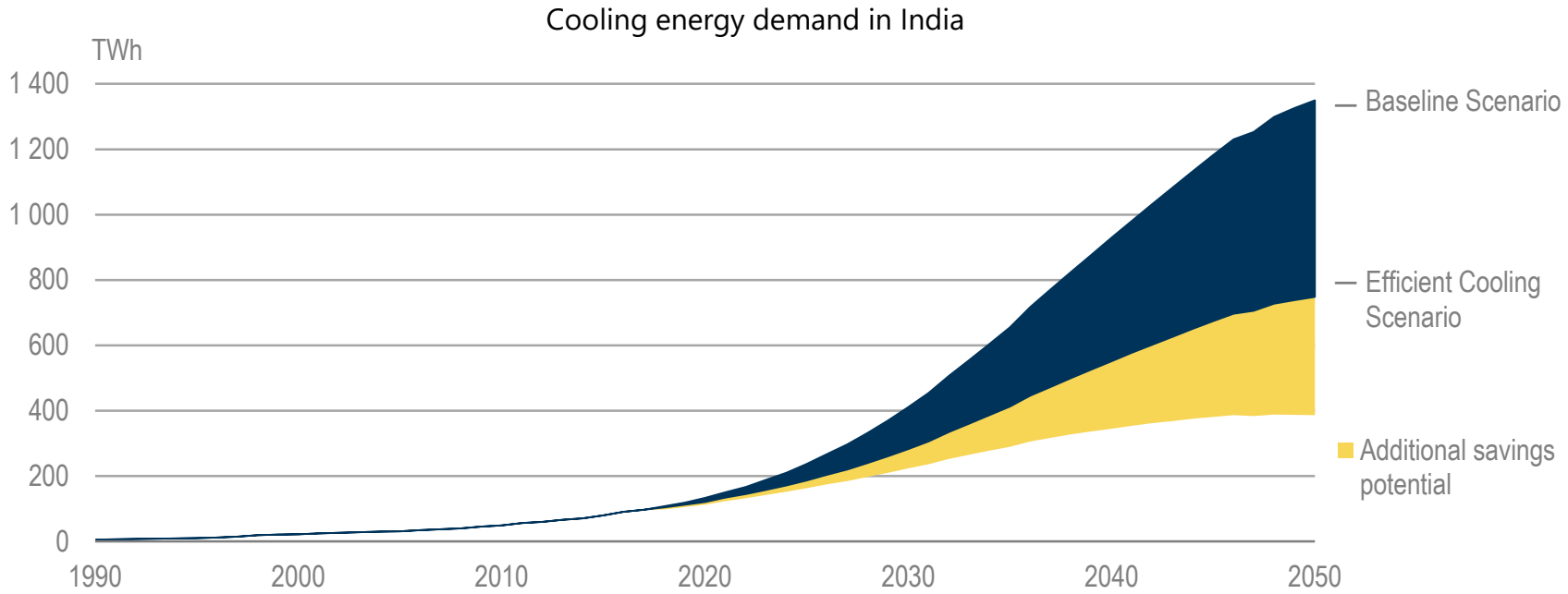


Efficient air conditioners can help to reduce the impact on the power system.

Impact on grid depends on load, location and time – cooling is already causing stress on grids today

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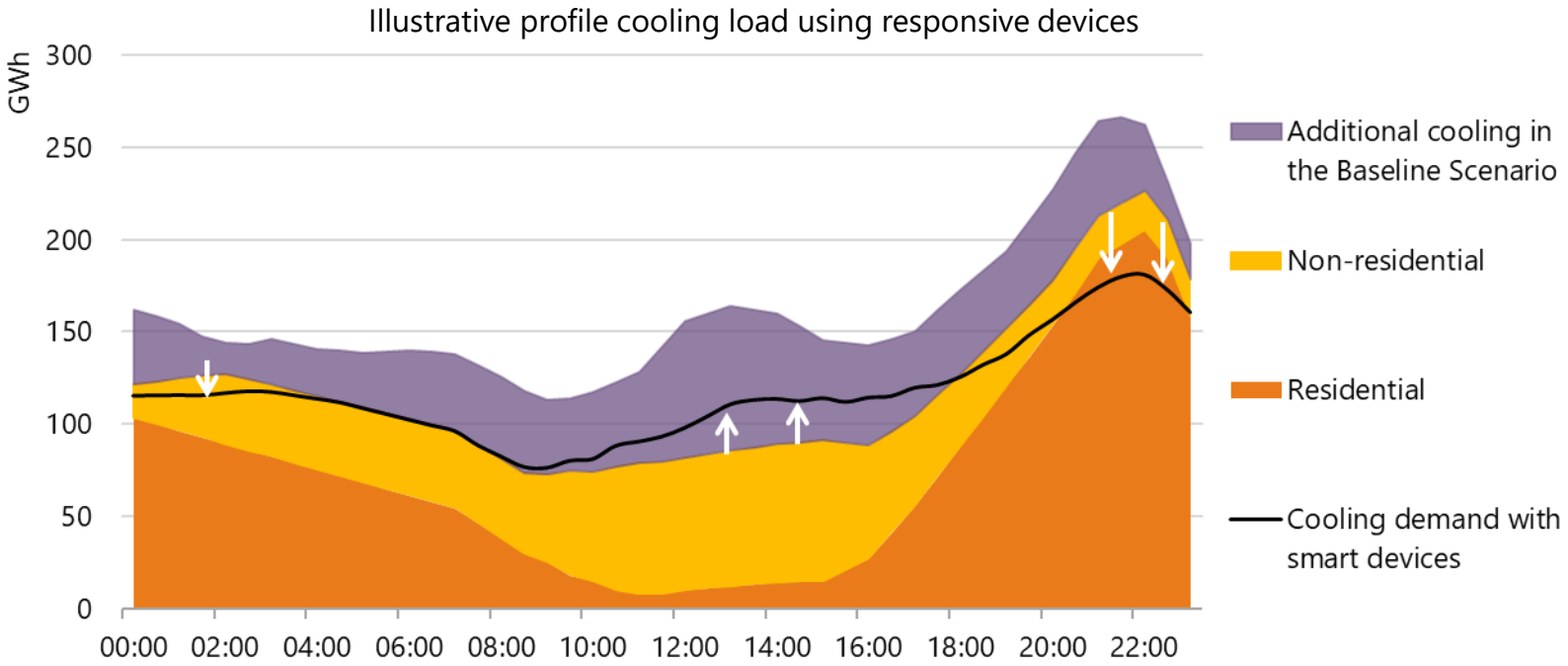
Potential space cooling savings in India



Without significant progress on cooling efficiency, space cooling electricity demand could increase 15-fold from today to 2050

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Smart, responsive ACs can also help to reduce the impact on the power system (China)

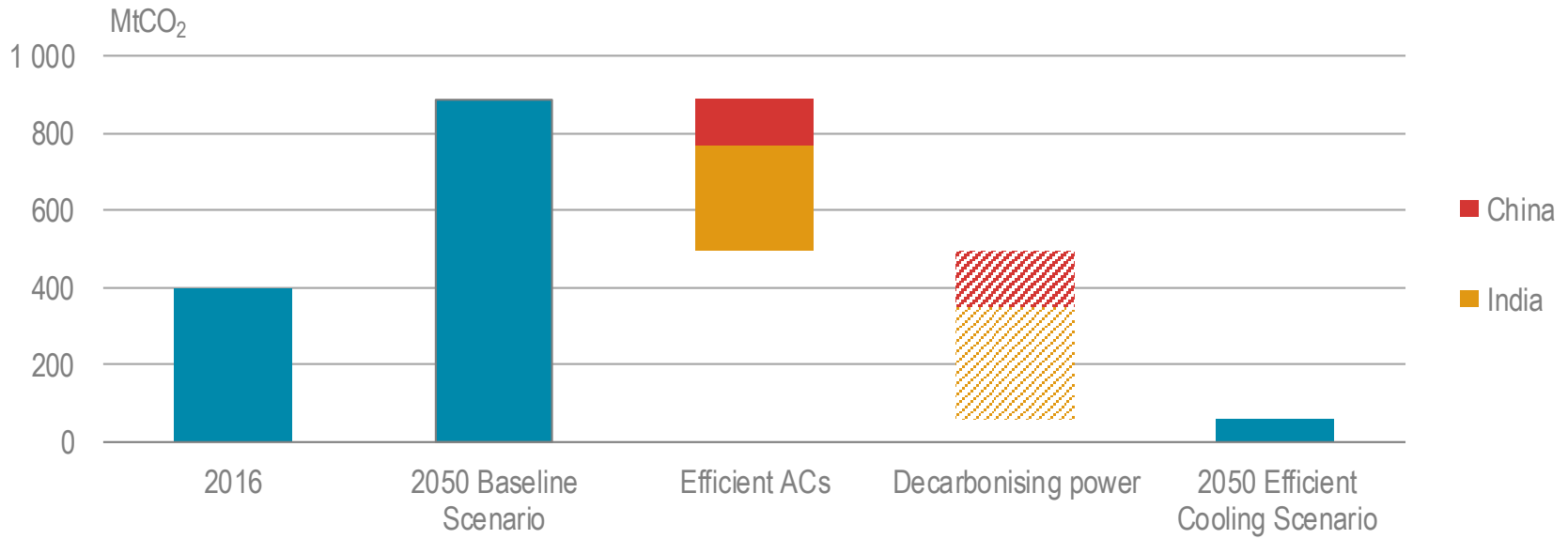


Improved AC energy performance can help reduce peak electricity demand, while further reduction can be achieved through connected and flexible ACs that enable demand-side response.

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Efficient ACs will help cut emissions in India and China

Contribution of more efficient space cooling on CO_2 emissions in India and China

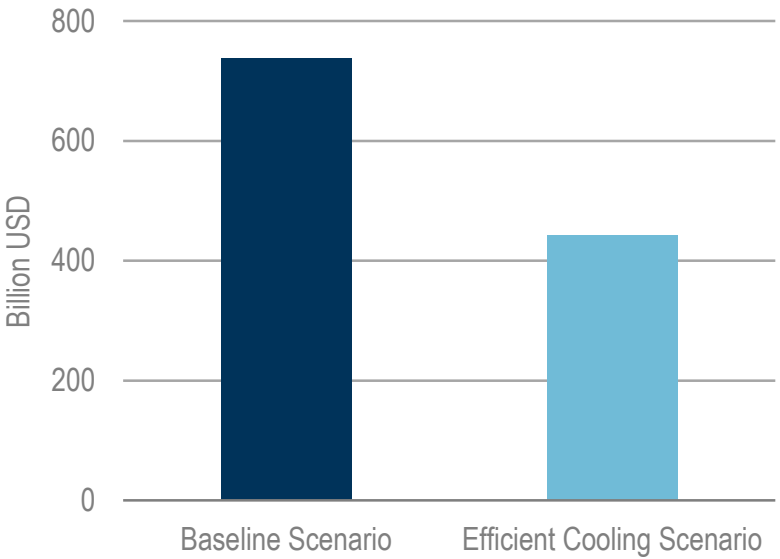


More efficient ACs in India and China cut CO_2 emissions from space cooling by nearly 45%. Efficiency also helps enable cleaner power – drastically reducing cooling-related emissions.

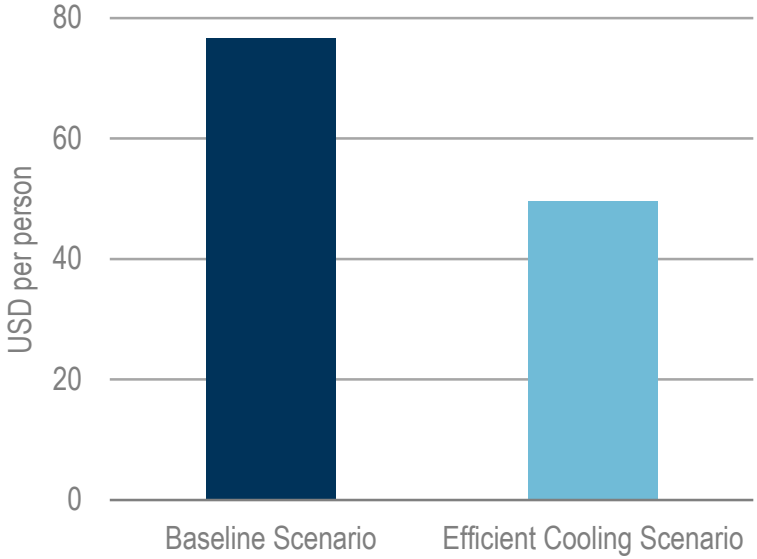
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Efficient space cooling can reduce need for power investments

Cumulative investments in power generation for space cooling to 2050 in India



Global average electricity costs per capita for space cooling in 2050 in India

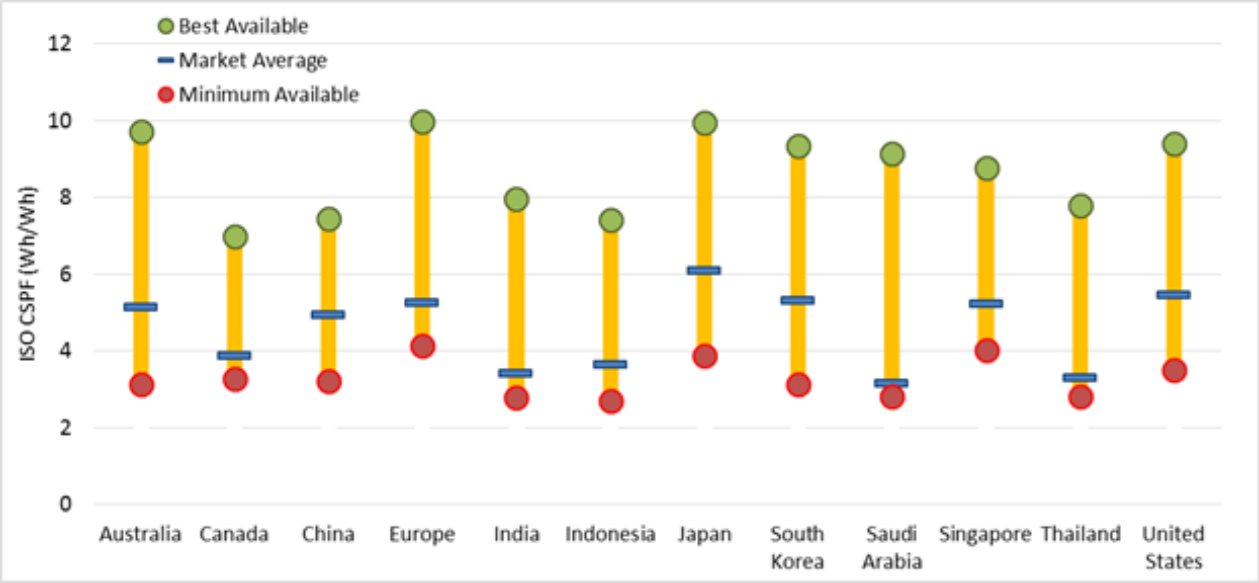


USD 295 billion in power generation investments can be saved in India with more efficient ACs. Average per capita electricity costs for cooling could be cut in third.

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Availability of efficient space cooling solutions

Overview of market availability of energy efficient air conditioners in select economies



Source: Park, W., A. Phadke, N. Shah, J. Choi, H. Kang, D. Kim, LBNL (2019)

There are significant opportunities to raise the floor and increase the bar

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It is possible to meet cooling needs efficiently and sustainably

- Understand current and future implications of cooling (load, location, time)
- Integrate energy planning in urban planning – empower local governments
- Reduce the demand for cooling – energy efficient buildings
- Ensure that all cooling appliances and equipment on the market are efficient
- Enable sustainable business models
- Ensure attention to proper sizing and servicing & optimisation
- Support systems efficiency, utilise waste energy
- Enable integrated solutions
- Raise awareness, influence behaviour – expectations
- Explore digitalisation for improved operation and demand response
- Stimulate further innovation and development

Technology
Awareness
Fashion
Legislation

Engage stakeholders beyond cooling/energy efficiency community

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Thank you for your attention

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