



Energy Efficiency & Cooling

John Dulac

Energy Efficiency Training Week Paris, 14 May 2018



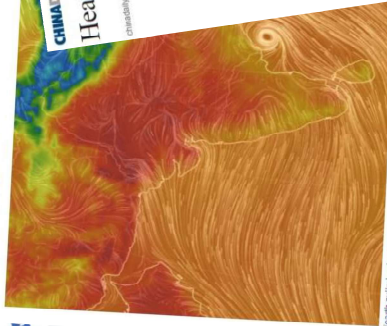
The world is getting hotter



Capital Weather Gang

India just set a new all-time record high temperature of 123.8 degrees

By Angela Fritz May 10, 2016



A small city in northwest India climbed to a scorching 57 degrees Celsius Thursday afternoon, and broke the country's record for all-time hot 50.6 degrees Celsius, was set in 1886.

Canicule : la France a enregistré un record de fortes chaleurs cet été

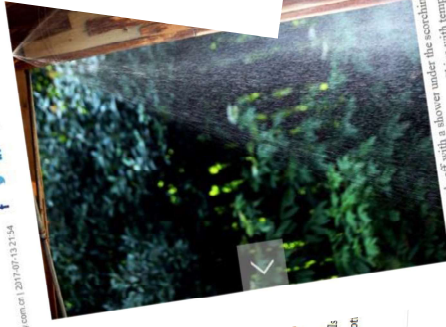
© + Sociés | Conakre-Granddeur | 21 août 2015 | 3005 | f t s



Silmarose, 14/21 août - Les fortes températures de ces derniers jours ont fait le bonheur des baigneurs. PHOTOGRAPHY: SUD OUEST / FABEN COTTEREAU

Heat wave sweeps across China

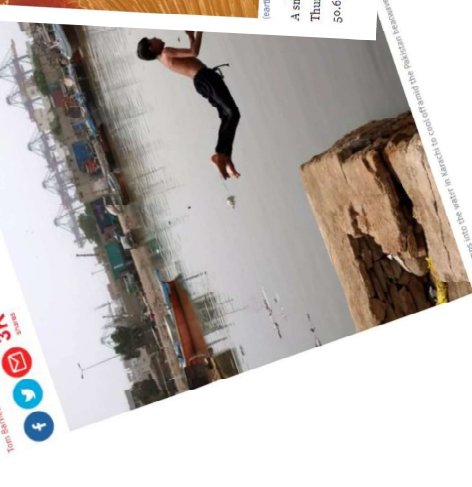
CHINA DAILY NEWS | Heat | China Society | f t in + | 2017-07-13 21:54



An alpaca recoils off with a shudder under the scorching sun at a zoo in Hingzhou, East China's Zhejiang province, on July 13. A heat wave is sweeping across China with temperatures in many areas exceeding 35 degrees Celsius on Thursday. [Photo by Xu Xiangping / chinanews.com.cn]

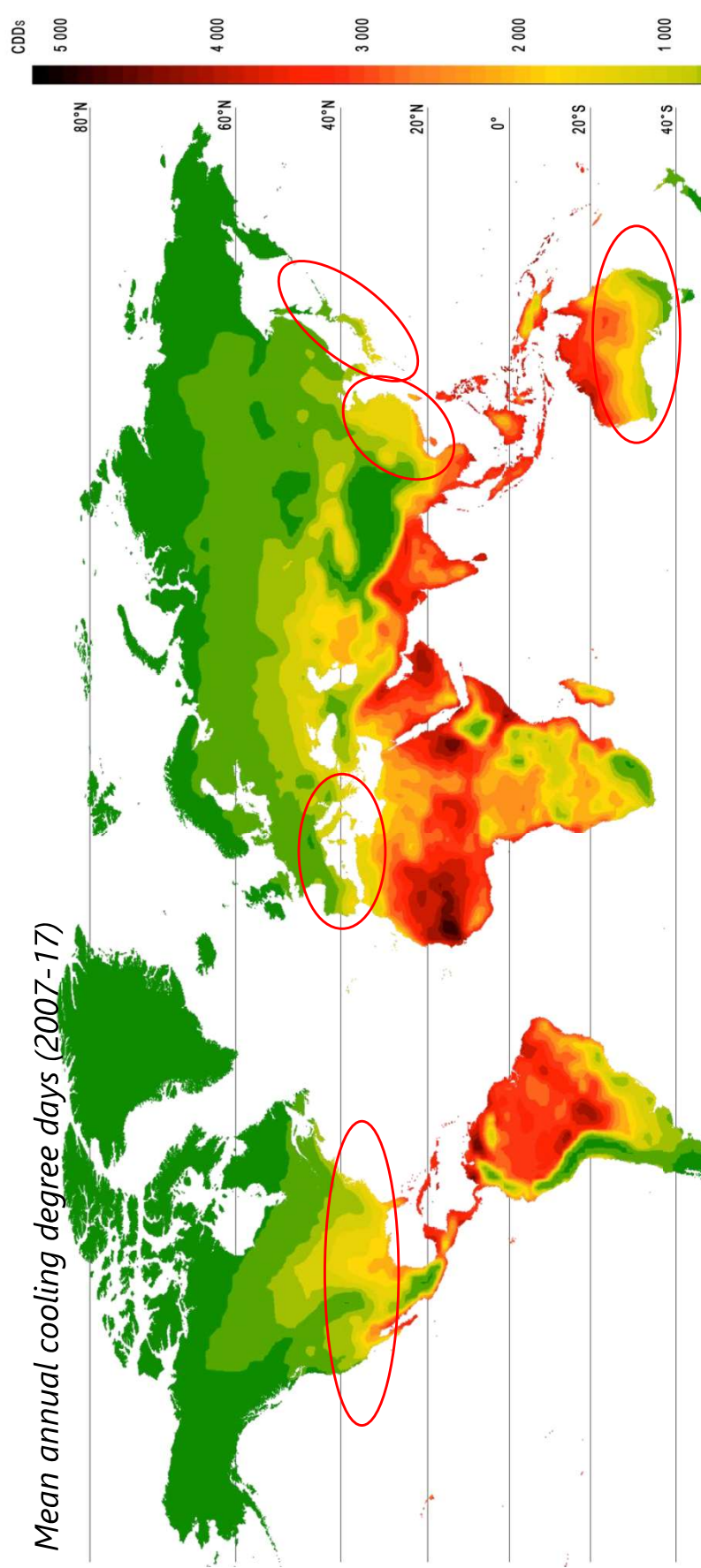
Hottest April day in history of the world recorded in Pakistan

Country records its earliest high night temperature



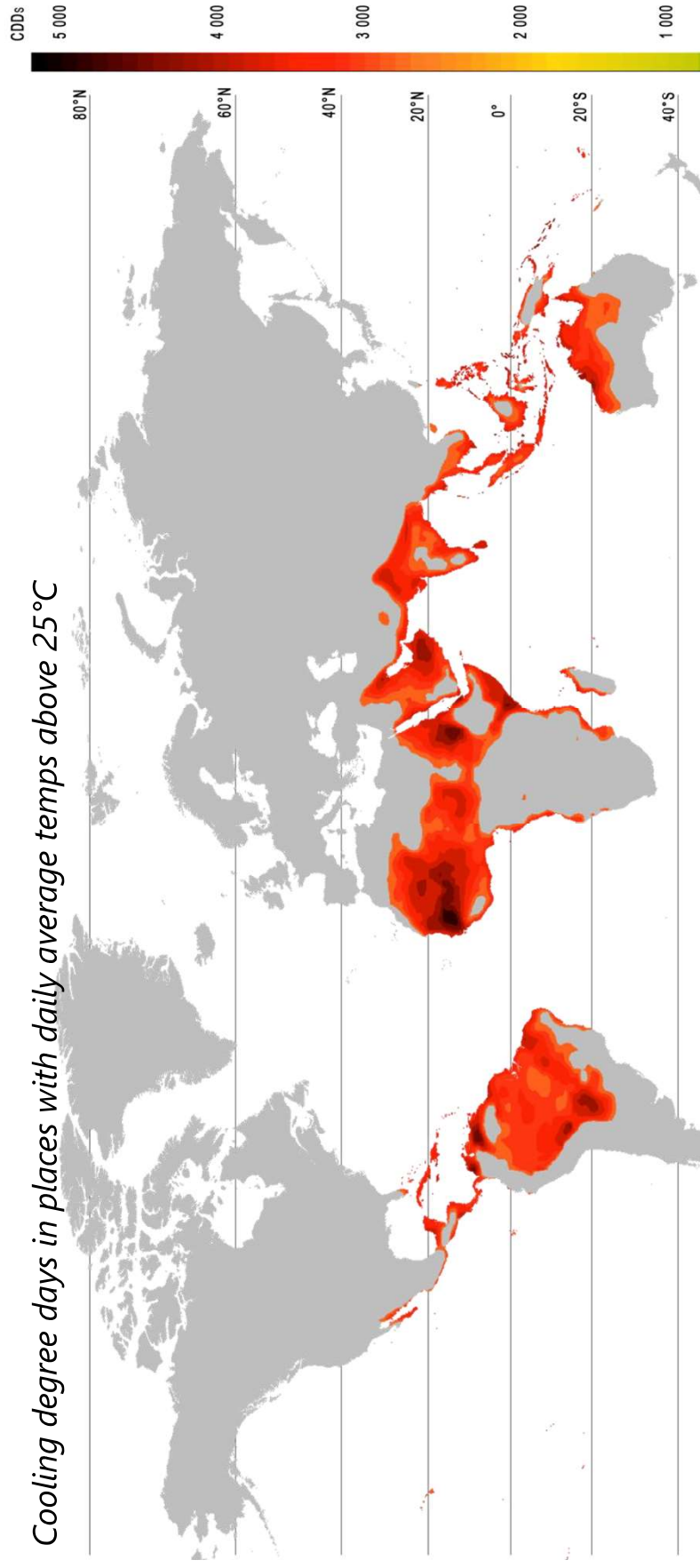
The need for cooling is growing – and with it demand for air conditioning.

Keeping cool is a growing need



Air conditioning is being driven by increasing expectations of thermal comfort – as well as the need for cooling in buildings to be healthy and productive.

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

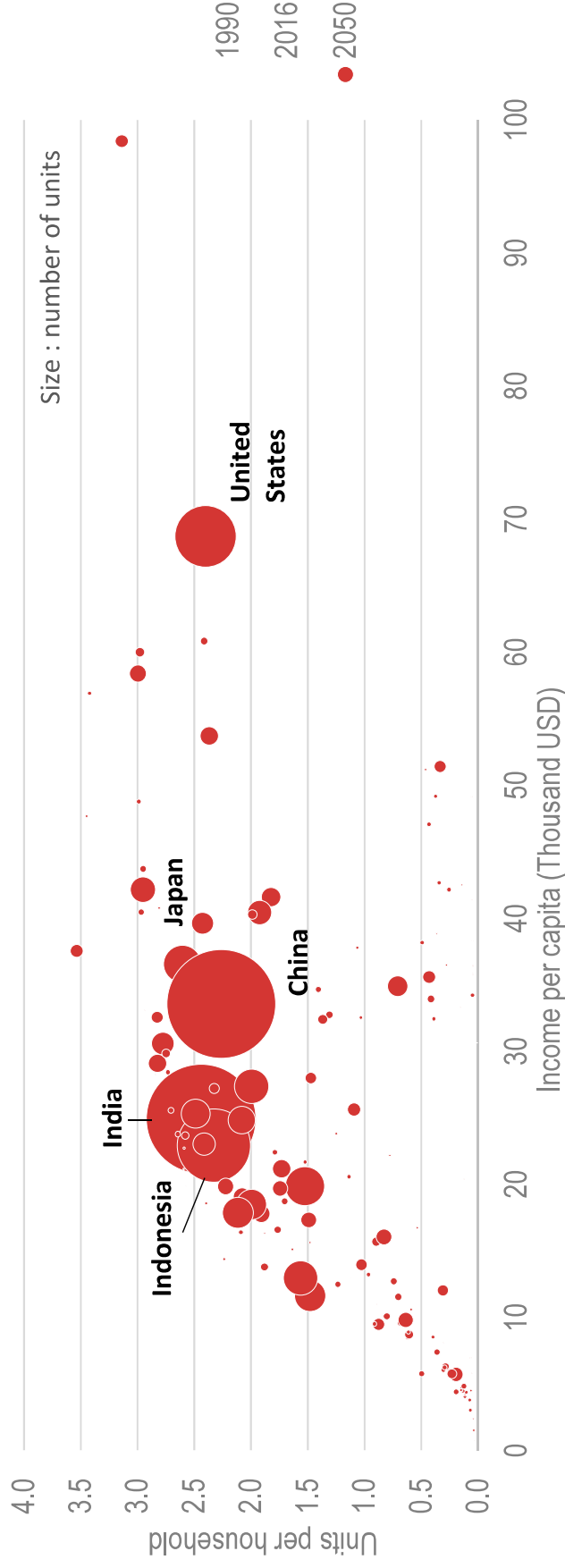


**There are around 2.8 billion people living in places where it is hot every single day.
Only 8% of them have an air conditioner today.**

AC ownership is expected to soar



Evolution of global air conditioner ownership

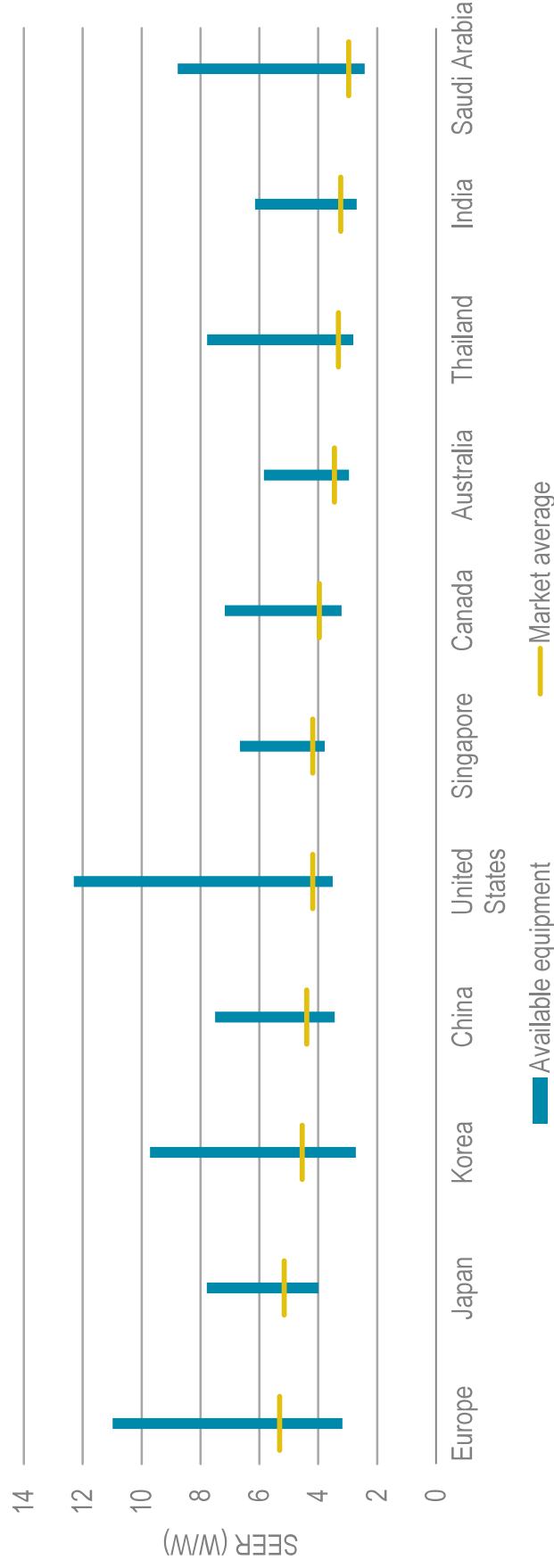


By 2050, around 2/3 of the world's households could have an air conditioner. China, India and Indonesia will account for half of all AC units in buildings in 2050.

Markets are not keeping up with energy efficiency potential

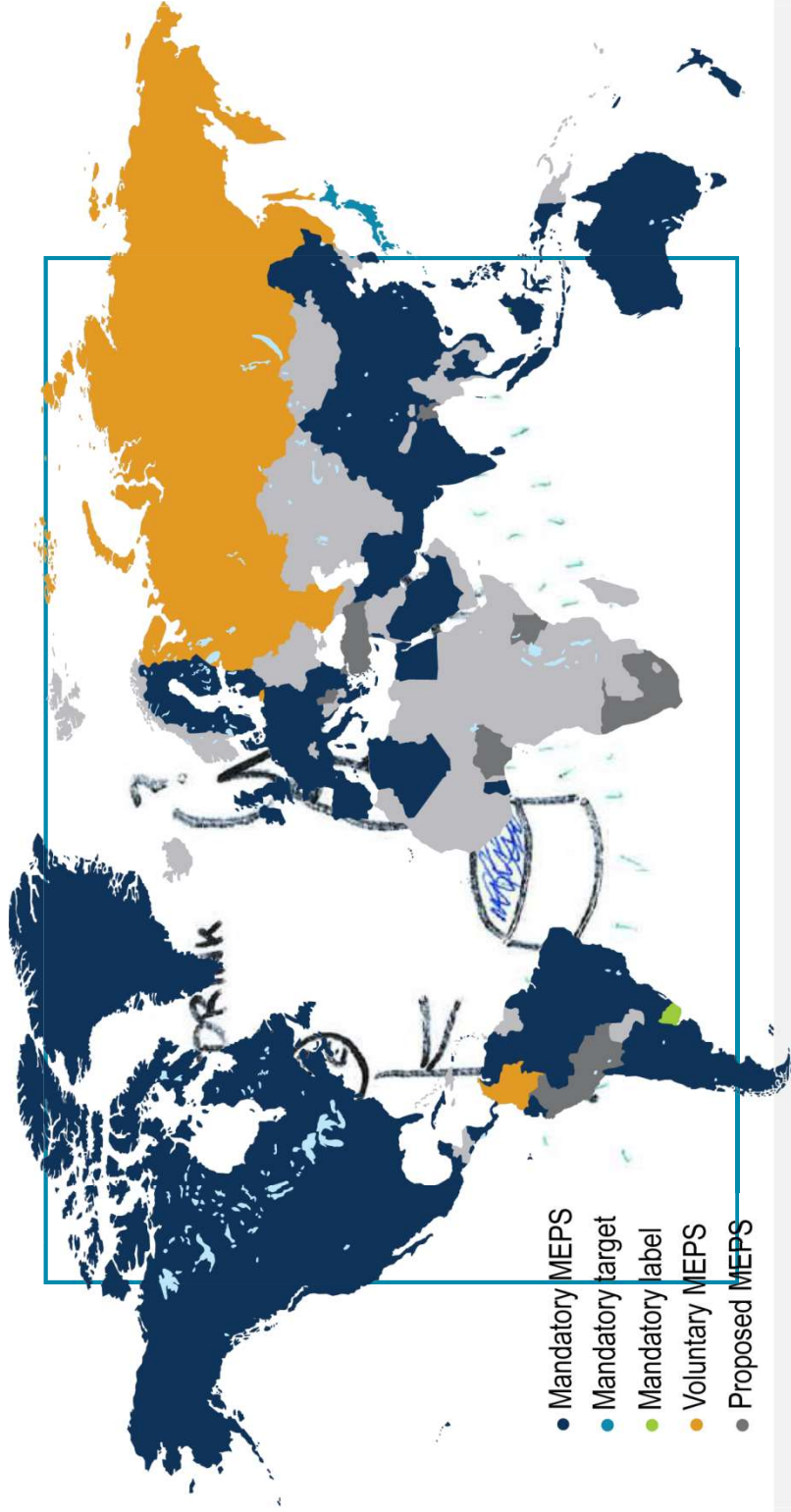


Energy performance of air conditioners already available in markets today



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

Energy policy is not keeping up with energy technology

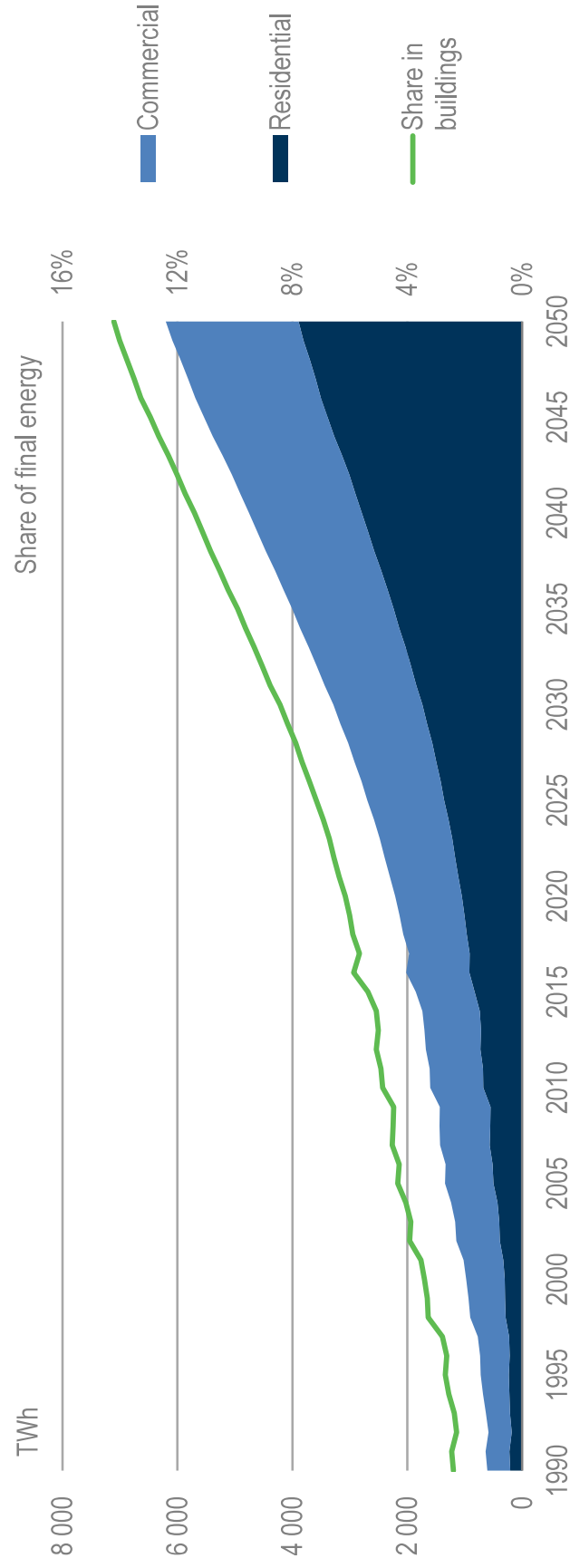


Most of the major cooling markets today have mandatory energy performance standards, but the required efficiency levels are typically far below those of the most efficient products available.

Without energy efficiency, cooling energy demand will explode



Space cooling energy demand growth without major energy efficiency improvements

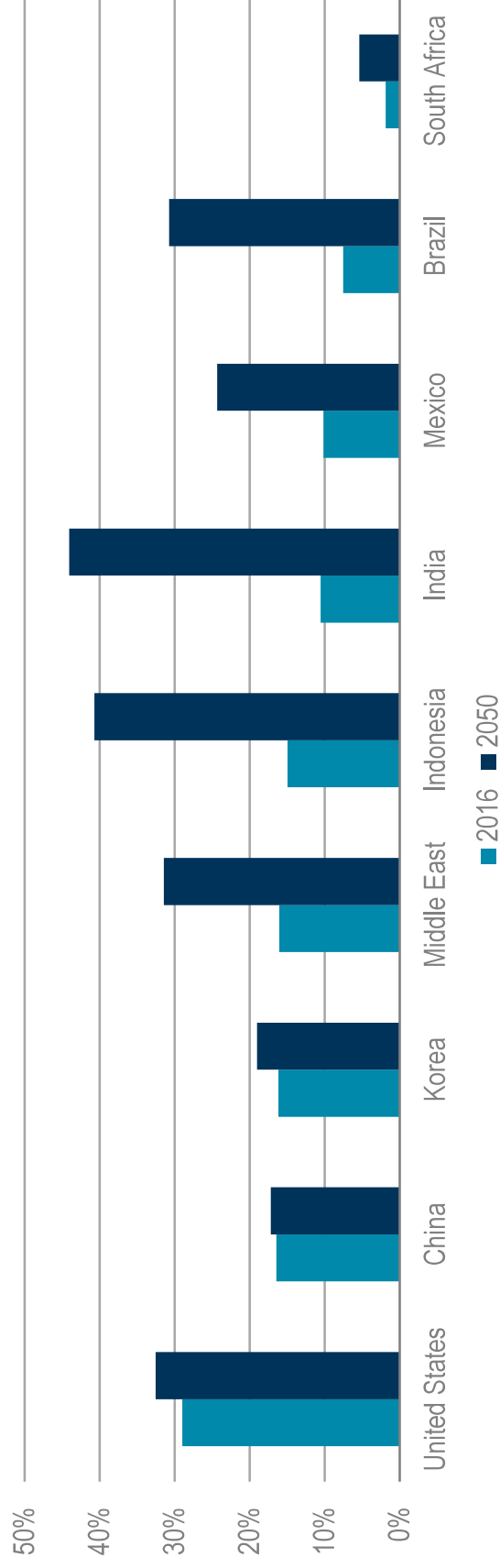


Energy needs for space cooling will more than triple by 2050 without energy efficiency gains – requiring as much electricity generation capacity as all of the US, EU and Japan today.

Implications of cooling demand without energy efficiency



Share of space cooling in peak electricity load without energy efficiency improvements

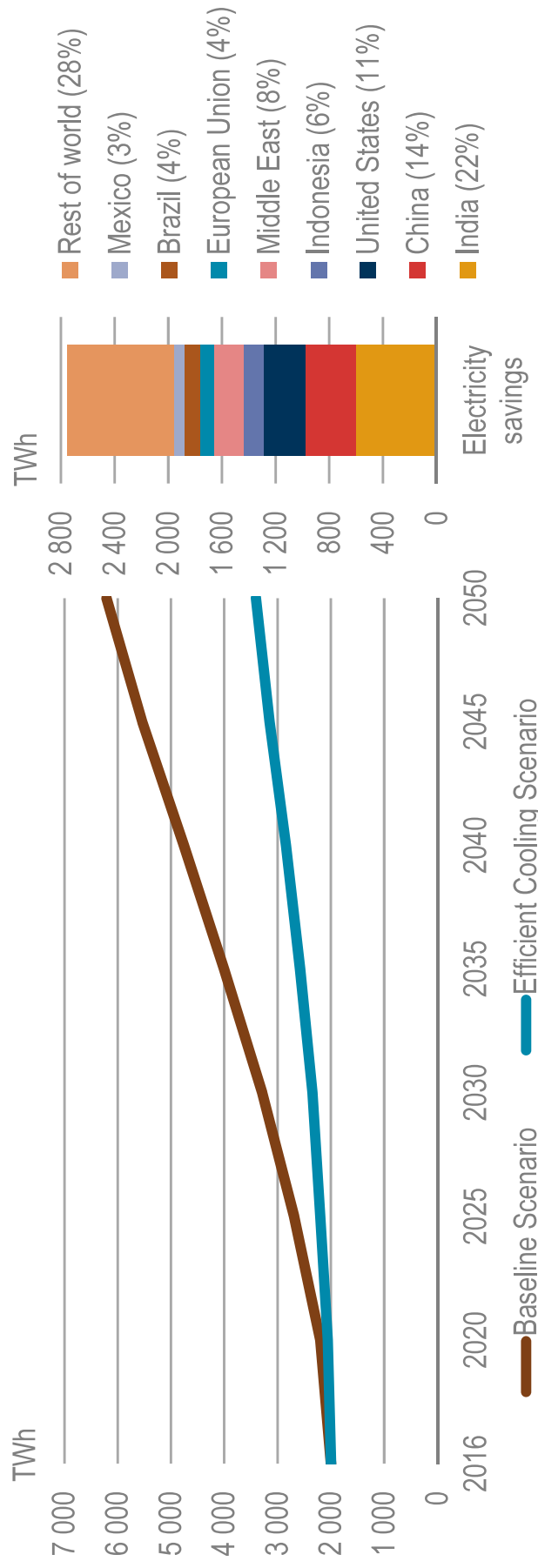


The share of cooling in peak electricity load will increase significantly in many countries without energy efficiency.

Energy-efficient air conditioning can halve cooling demand growth



Electricity savings using energy-efficient air conditioning

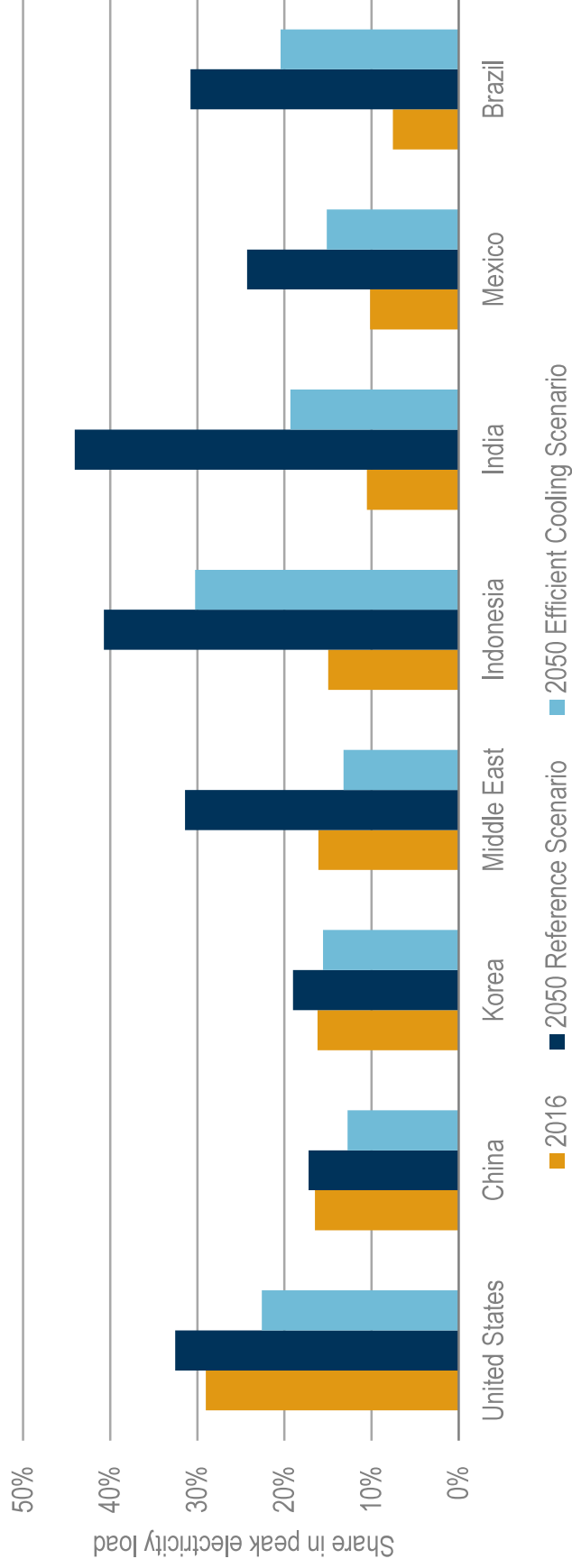


Energy efficiency can deliver nearly 2 800 TWh of electricity savings in 2050 – equivalent to all the electricity consumed by the European Union in 2016.

Cooling demand has serious implications for grids



Share of cooling in electricity system peak loads

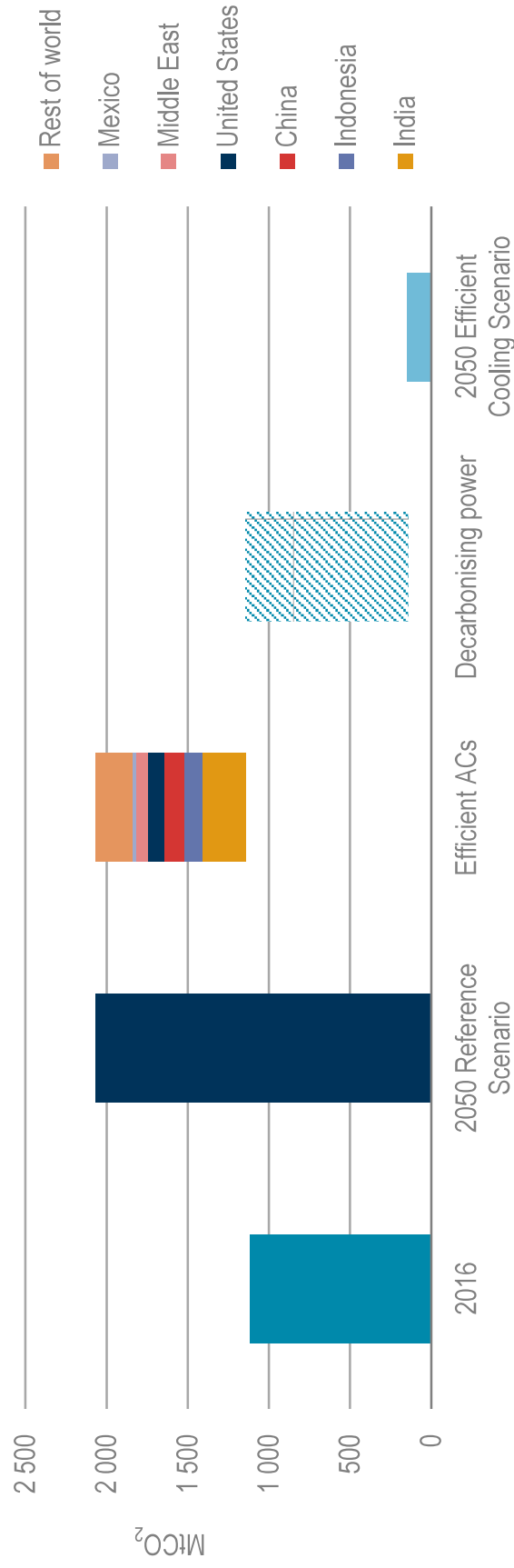


Efficient air conditioners can help to dampen the impact on the power system.

More efficient ACs will help cut emissions



Contribution of more efficient space cooling on CO₂ emissions

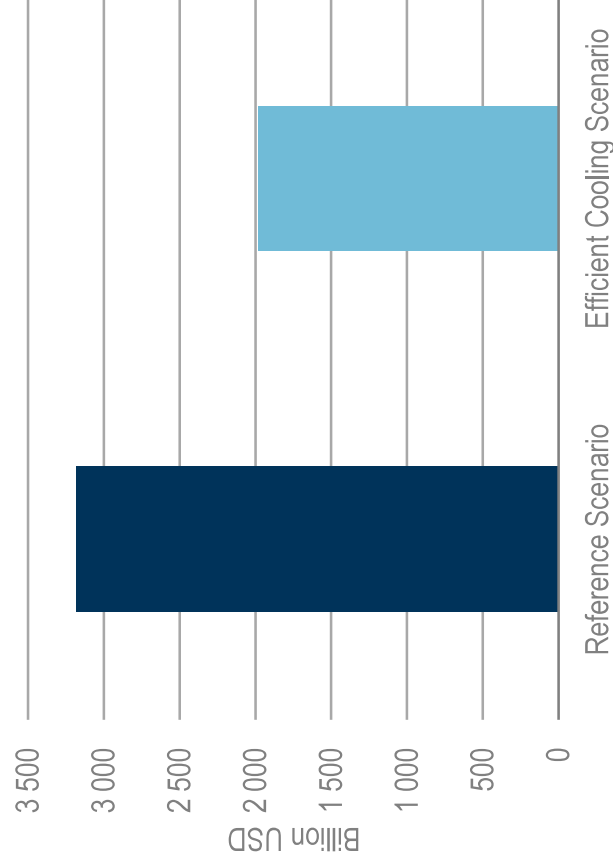


More efficient ACs cut CO₂ emissions from space cooling in half. Efficiency also helps enable cleaner power – drastically reducing cooling-related emissions.

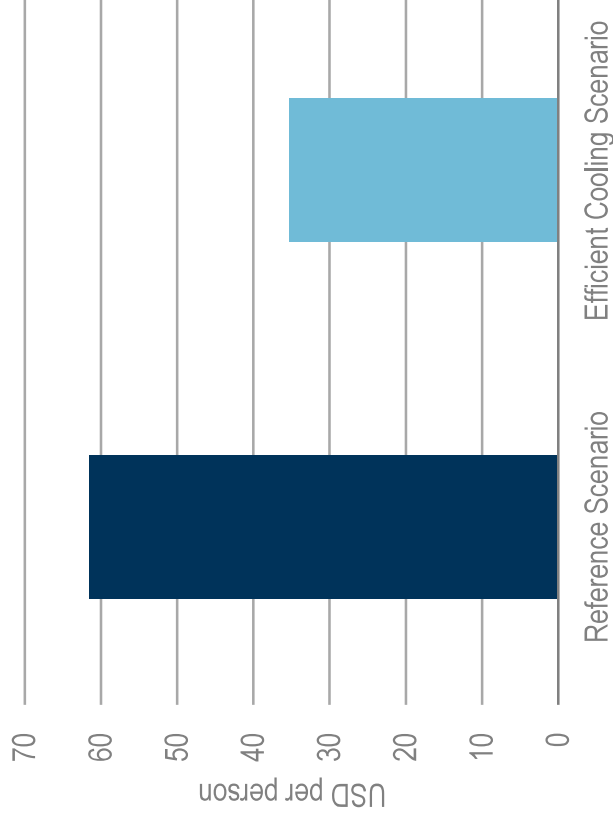
More efficient ACs can lessen the costs of new power generation



Cumulative investments in power generation for space cooling to 2050



Global average electricity costs per capita for space cooling in 2050



USD 1.2 trillion in power generation investments can be saved globally with more efficient ACs. Average per capita electricity costs for cooling would be almost halved.

Building envelope measures can provide cooling comfort

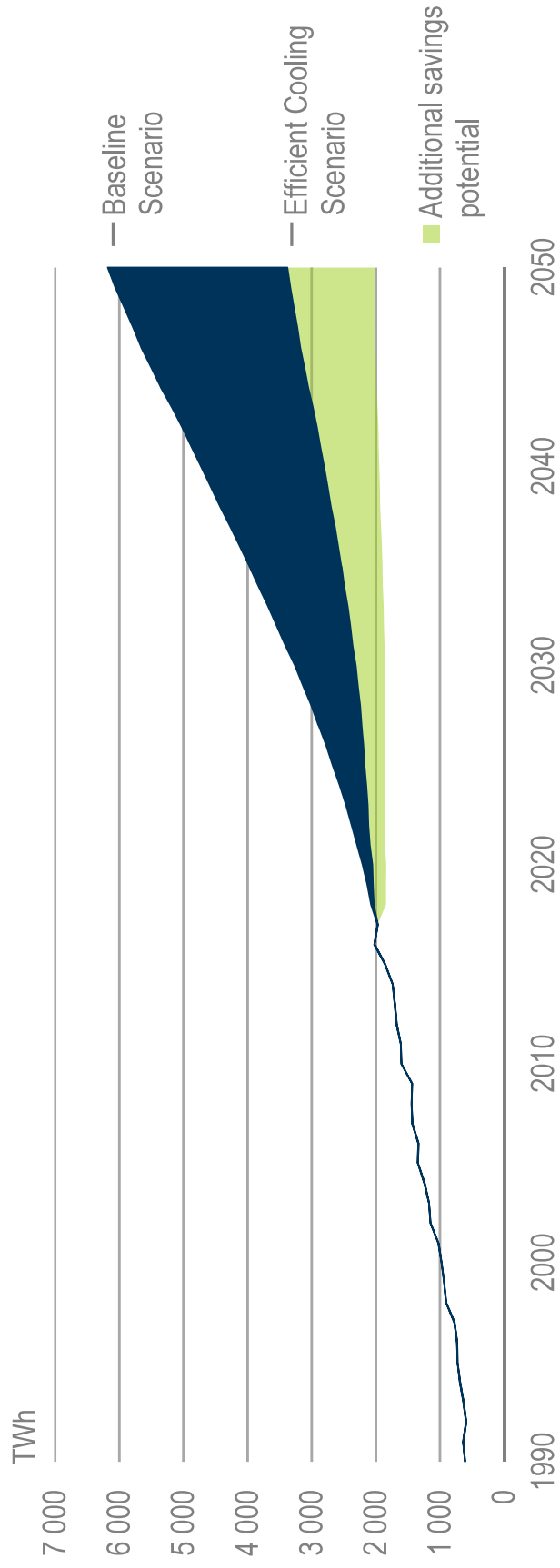


Ancient and modern cooling techniques can be a no- or low-cost energy efficiency measures.

Further savings are possible!



Additional energy savings potential through energy efficiency measures



Additional measures – such as better building design and construction, can keep cooling energy demand stable – while also allowing billions of people better access to keep cool.

Policy action to curb cooling-related energy needs



Capturing the major energy efficiency potential for space cooling in buildings

- Absent firm policy interventions, cooling-related energy demand will soar
- Policy action can deliver substantial energy savings quickly by making AC equipment much more efficient
- Priority must be given to mandatory standards and labelling for ACs
- Measures to improve the energy performance of building envelopes would contribute to even bigger energy savings in the longer term
- **Energy energy can deliver cooling comfort – affordably and sustainably.**



Thank you!

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