

### EXECUTIVE SUMMARY

- ▶ Air conditioners contribute at least 12% to overall GHG emissions and the number of AC units is predicted to rise from 1.6b to 5.2b by 2050 (IEA)
- ▶ We have entered a vicious cycle, where we are inadvertently heating the world by trying to cool it down
- ▶ The majority of buildings are set to 21-22°C owing to building codes, leasing agreements and manufacturer settings, but the latest research recommends 25°C as the best ambient temperature for productivity and overall comfort
- ▶ A policy requiring a default temperature setting of 25°C in tropical regions would appeal to:
  - Businesses via energy savings (up to 6% cost reduction for every 1°C increase)
  - Governments through lower overall peak demand on the network and reduced greenhouse gas emissions
  - Employees through improved comfort
- ▶ This is a “quick win”, behaviorally informed demand-side policy, complimentary to other medium-term policies regarding efficiency, refrigerant management, technology and renewable energy

### POLICY CONTEXT

#### The benefits of being cool

Air conditioners can make people healthier, wealthier and wiser. Tropical regions rely on air conditioning systems to enhance productivity. In the Caribbean, the GDP falls by 1% for every degree that exceeds the average 26°C. Cooling in transport and storage could have a larger impact on food availability than the Green Revolutions. According to the WHO, annually 600m people fall ill and over 400,000 die thanks to consuming contaminated food. Better cooling helps reduce all these harms.

#### From luxury to necessity

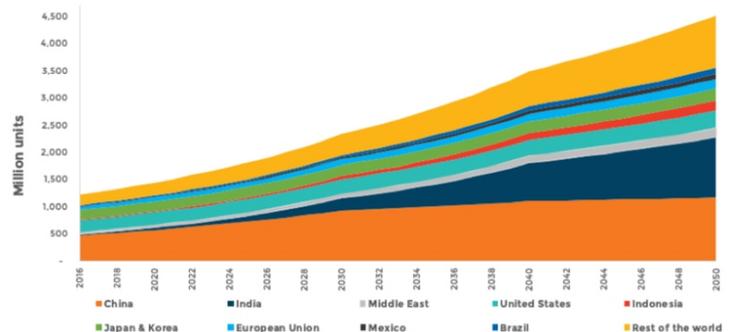
Currently, only 8% of the 3 billion people in the tropics have air-conditioning as compared to more than 90% of homes in Japan and America. With global warming and strong economic growth especially in heavily populated tropical nations, the demand for air-conditioning is skyrocketing. By 2050, around 2/3 of the world’s households could have an air conditioner. China, India and Indonesia will account for half of the total number.

“*One of the most critical blind spots in today’s energy debate*” Fatih Birol, Head of the International Energy Association (IEA)



“*A death spiral. We are heating the world by trying to cool it down*”

Figure 1: Projected Global Air Conditioner Stock. 2016-2050



### THE PROBLEM

#### Air-conditioners emit greenhouse gases in three ways

1. They are responsible for the CO<sub>2</sub> generated in the power stations that produce their required electricity. Conservatively, this represents 12% of the global total of CO<sub>2</sub> produced (IEA).
2. They require new power plants. In Malaysia, air-conditioners account for approximately 60% of electricity demand during peak hours. Peak hours are critical because authorities must build enough power stations to meet the maximum demand, typically using coal, gas or diesel to quickly increase supply.
3. Air conditioners use refrigerants with hydrofluorocarbons (HFCs). When the machines leak during operation or on disposal, these gases escape into the atmosphere where they trap between 1,000 and 9,000 times as much heat as the same amount of CO<sub>2</sub>. Paul Hawken of Project Drawdown, a think-tank, calculated that improving refrigerant management could do more than anything else to reduce greenhouse gases.

#### Supply side measures will take time

The recently signed Kigali amendment commits signatories to reduce production and importation of HFCs by 85 percent by 2036 if a developed country, and 80 to 85 percent by 2047 if a developing country. Similarly, the UN Environment Agency is working on efficiency standards and phasing in super-efficient devices, but as with the Kigali amendment, this could take decades. Given the urgency and as part of an integrated policy response, corporates and governments should prioritise demand-side measures to reduce emissions.

### Policy Recommendations

This brief has six recommendations to ensure that settings on air conditioners are defaulted to 25°C:

- 1 Set Building and Leasing Standards at 25°C :** Governments and corporates should reset standards for building and leasing firms, such that switching to 25°C does not contravene any laws
- 2 Manufacturer Settings :** Newly purchased cooling units should be defaulted to 25°C and maintenance manuals should be aligned with these settings
- 3 Accreditation :** Accreditation should occur for corporates and buildings that embrace the policy. Accreditation can leverage social proofing to drive more rapid uptake and a small accreditation fee could finance investment required to implement these policy changes
- 4 Consumer Education & Online Tools :** An education campaign and online tools should be created to allow maintainers, corporates and building lessors to tangibly calculate the benefits of changing their default temperatures
- 5 Monitoring, Verification and Enforcement by the people :** Employees take an interest in ensuring that workplaces remain at the required temperature and that their employers are doing the right thing.
- 6 Inclusion into broader energy policy :** This initiative should be part of an integrated energy and environmental policy

### Why is this compelling?

A policy to increase the default temperature of air conditioners is compelling owing to its ease of implementation relative to its significant impact.

### Why this works using the EAST Framework for Behavioural Change

	Individuals	Corporates	Governments
<b>EASY</b>	▶ No changes required	▶ Changing the default air-conditioning settings can be done within a matter of seconds	▶ Changing or waving building codes to 25°C rarely has any structural or safety consequences
<b>ATTRACTIVE</b>	▶ Improved productivity and comfort between 21°C and 25°C	▶ In tropical regions, raising the room temperature by 1°C saves about 6% of electricity, thus setting the temperatures to 25°C would save 18-24% electricity (IEA) ▶ Companies could also trade carbon credits as a result of these savings	▶ Quick demand-side measures will help countries reach Paris Climate Accord and Kigali Amendment commitments. ▶ For India, this change represents 10 billion units of energy, 30% of current demand (IEA)
<b>SOCIAL</b>	▶ Sense of helping the environment	▶ Initiative could be used to promote their Corporate Social Responsibility	▶ Fulfilment of Paris Agreement and Kigali Amendment will be seen favourably in the international politics.
<b>TIMELY</b>	The focus on global warming from people, especially young people, is forcing the corporates they buy from and the government they help elect to prioritise environmental initiatives. Implementation is quick. Changing building codes and promoting changes in default settings could be achieved within 12 months. The Japanese government immediately lifted office temperatures to 28°C after the Fukushima nuclear disaster.		

### Are defaults sustainable?

Once the default is set, there is strong empirical evidence to suggest individuals and corporations accept their default assignment, be it organ donation, vaccine use, exercise, marketing, retirement savings decisions or water and electricity conservation. In such a case, new legislation and regulation may not be required by governments.

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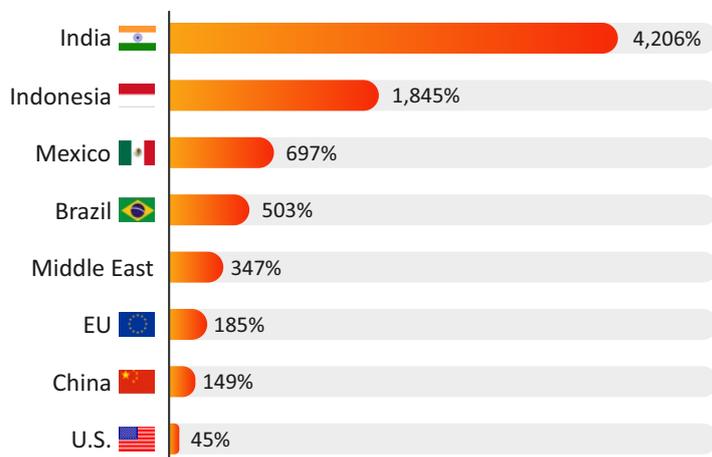
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### Focus on commercial. Focus on India and Indonesia.

Though residential units outnumber commercial units, commercial air conditioners typically use 5-10 times more electricity. Therefore, a practical approach to raising the default temperature settings is to prioritise commercial spaces such as malls, government offices and airports. Given their populations, economic growth rates and climate, the policy-makers in India and Indonesia should pay particular attention.

### Countries/regions with largest projected units growth 2016 - 2050



### Policy Limitations

Devices without thermostats will not benefit from the change, but this number will decrease as energy efficient devices gradually penetrate the market. For pragmatism, this policy brief will not suggest a scheme to add a thermostat to all devices devoid of it. Further, the 25°C target may not apply during winter or to buildings where lower specific temperatures are required such as hospitals, food processing and data centers.