The Future on Cooling in China

Delivering on action plans for sustainable air conditioning

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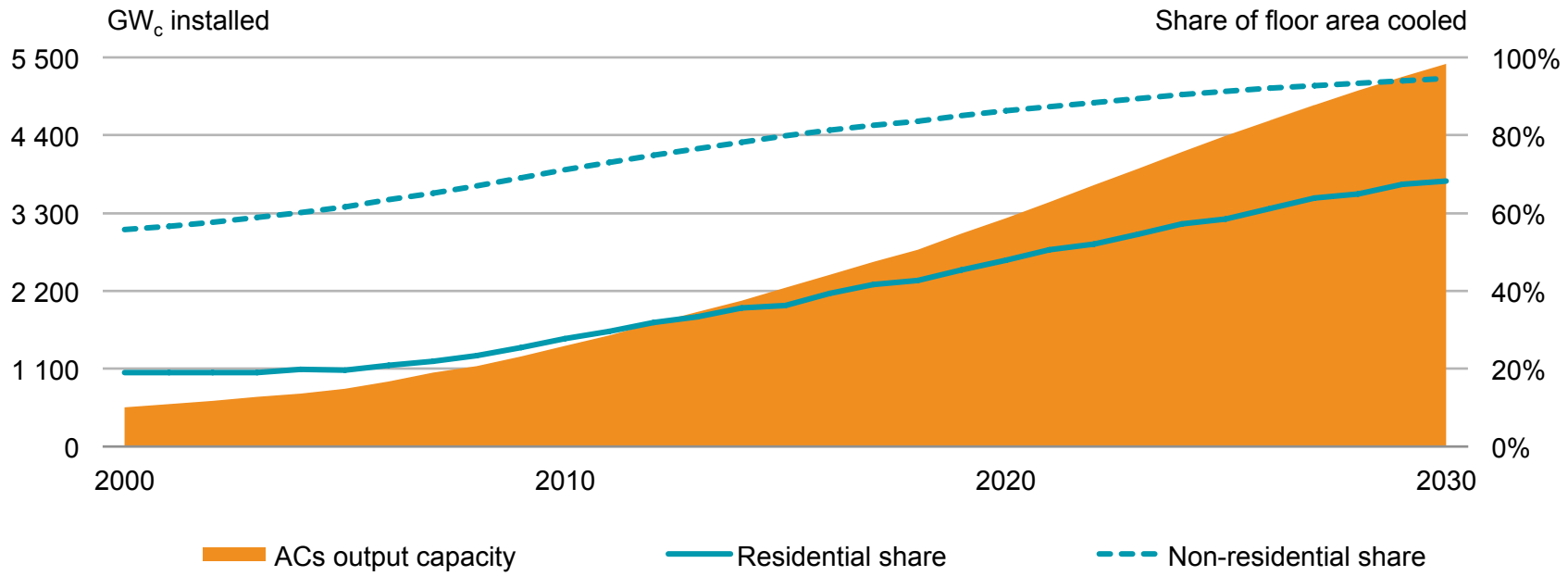
China faces a ‘cold crunch’

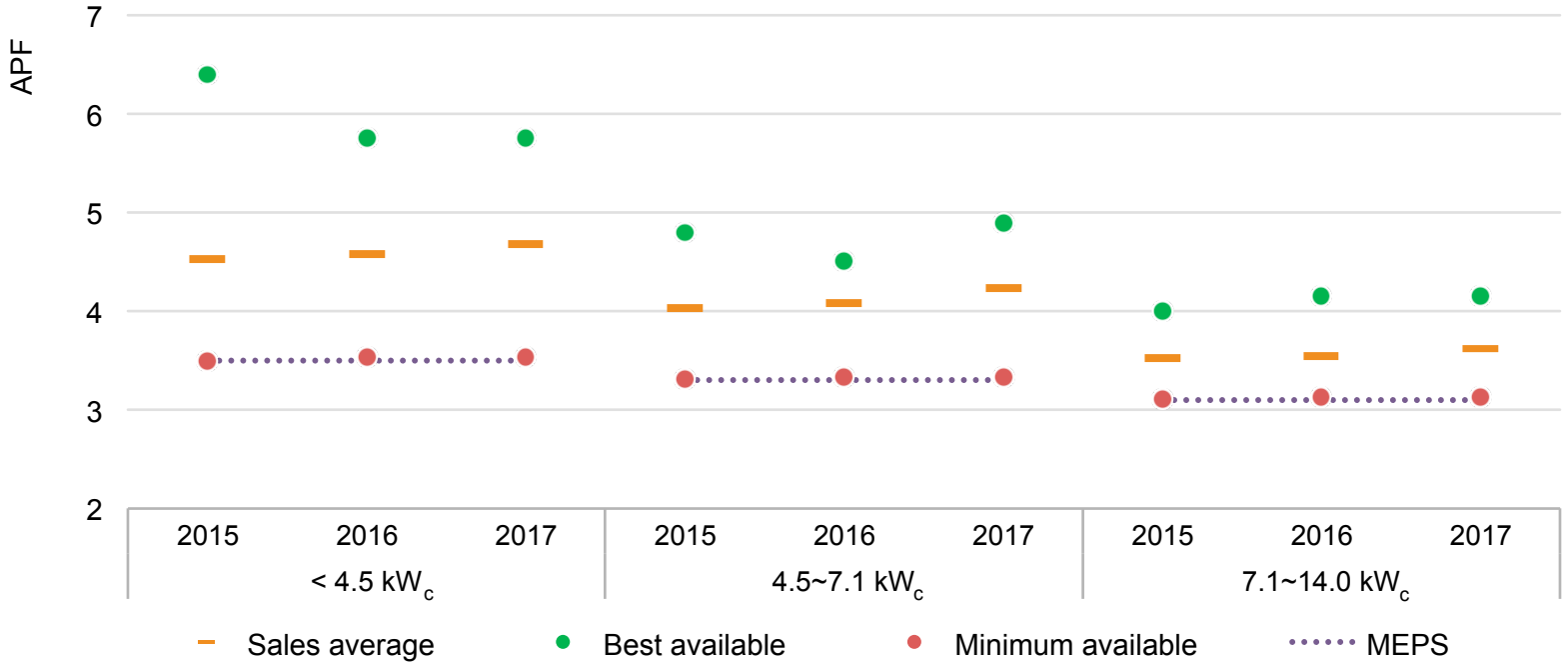
Installed cooling capacity for space cooling equipment in China 2000-30



China is expected to account for around one-third of cooling capacity growth over the next decade, representing as much as one-quarter of total installed capacity by 2030.

Cooling equipment is less efficient than its potential

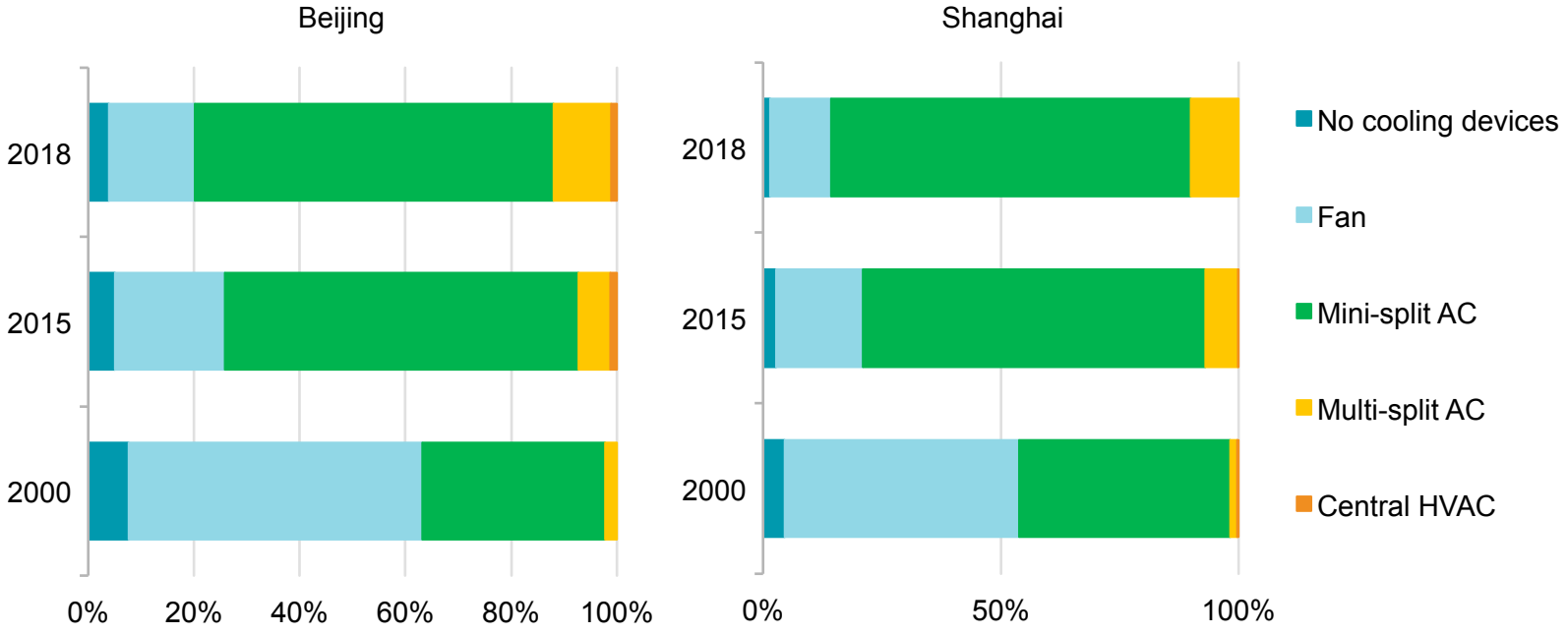
Range of energy performance for variable-speed mini-split ACs in China, 2015-17



The average annual energy performance of ACs is lower than what is readily available in the market.

The air conditioner market in China is evolving

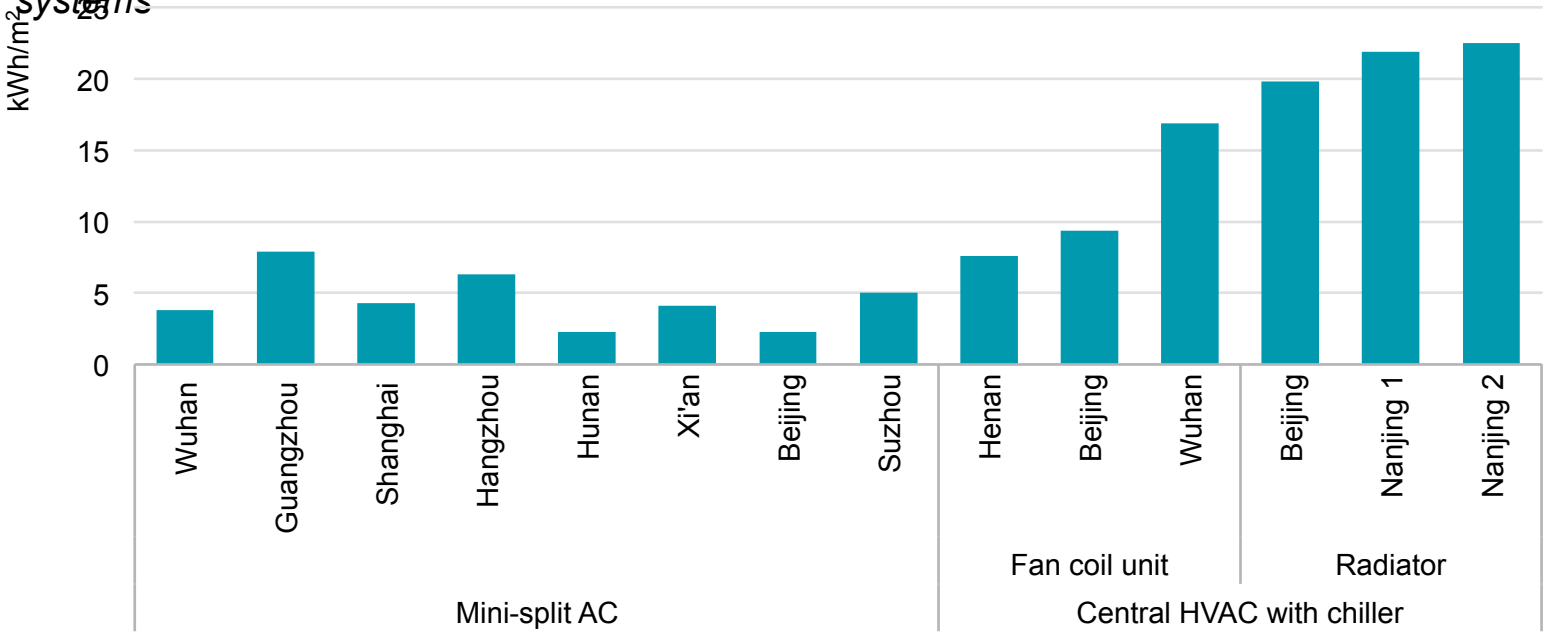
Equipment choice in urban households in Beijing and Shanghai, 2000-18



Choice of cooling equipment in households is shifting to more energy intensive systems.

Equipment choice impacts energy consumption

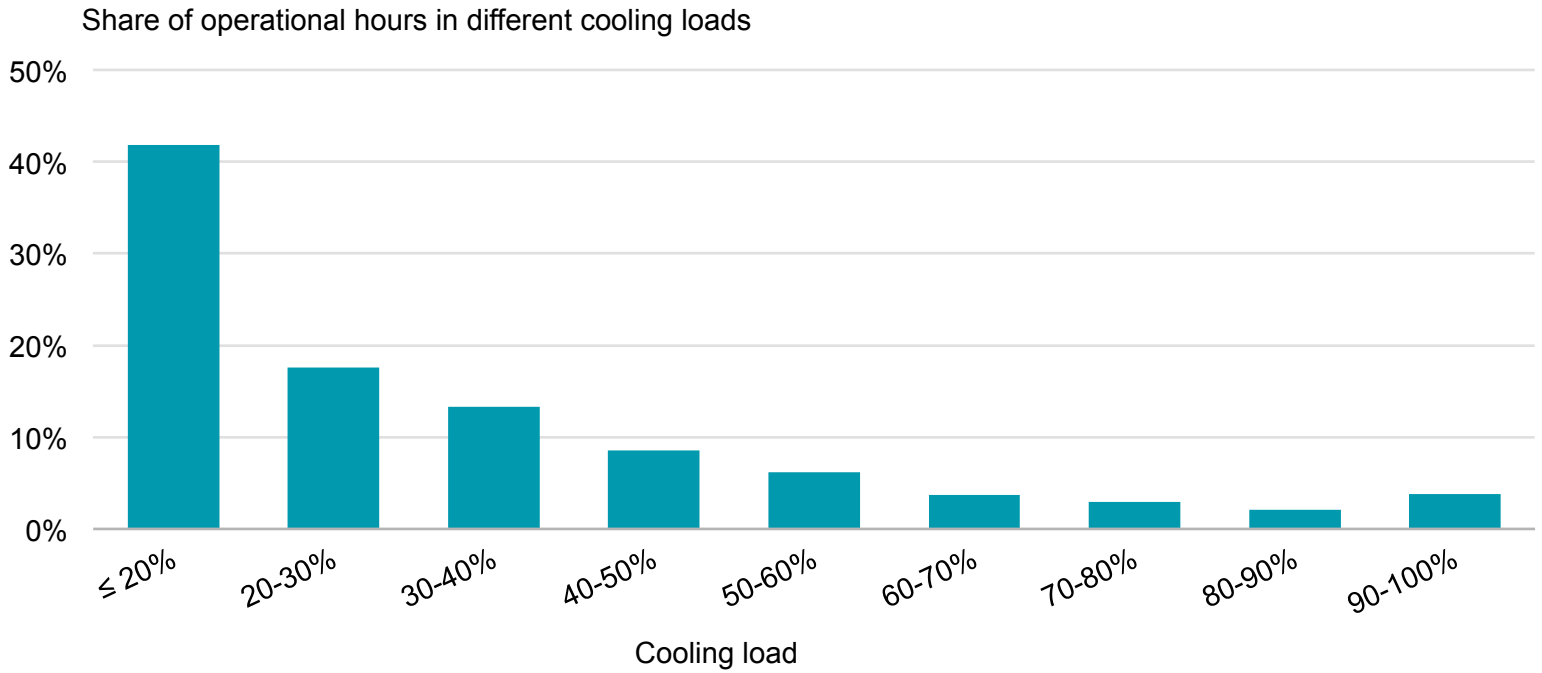
Average measured energy intensity of mini-split ACs and central HVAC systems



The energy intensity of central HVAC systems is generally much higher than mini-split ACs.

Effort is needed to address the gap in real energy performance

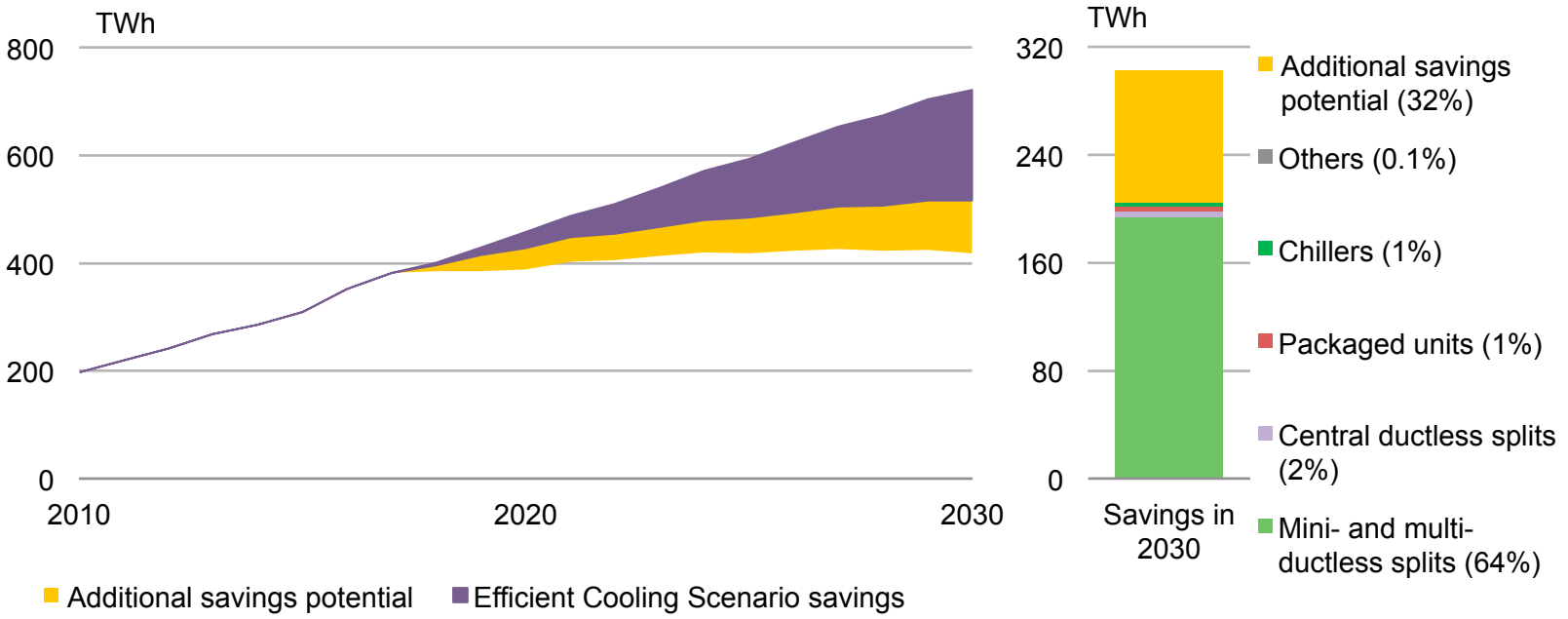
Operational conditions of multi-split ACs in China, 2016-17



Multi-split ACs can operate as much as 60% of the time at low partial loads, impacting energy use.

Efficiency will play a major role in limiting energy growth

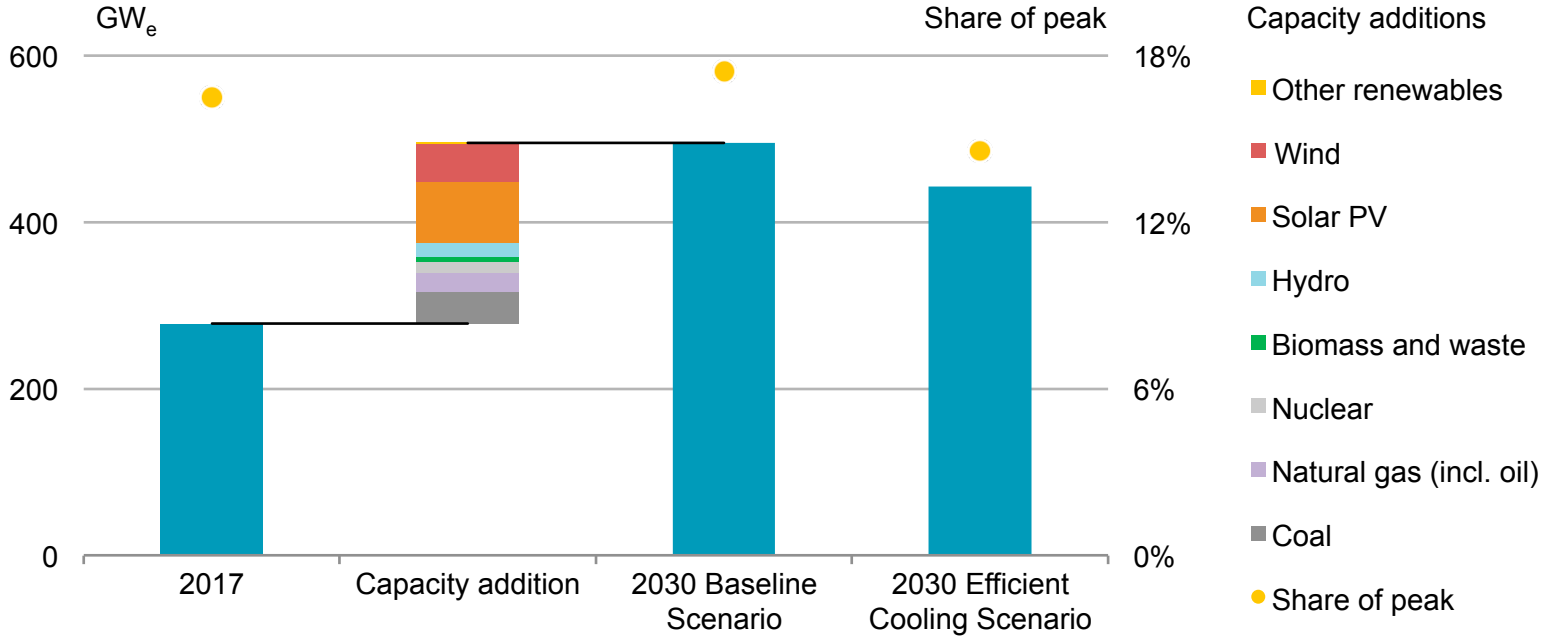
Electricity savings for cooling services in buildings to 2030



As much as 205 TWh of electricity can be saved using more efficient equipment. Another 100 TWh of savings can come more better building design and cooling behaviour.

Efficient ACs will have benefits for the electricity system…

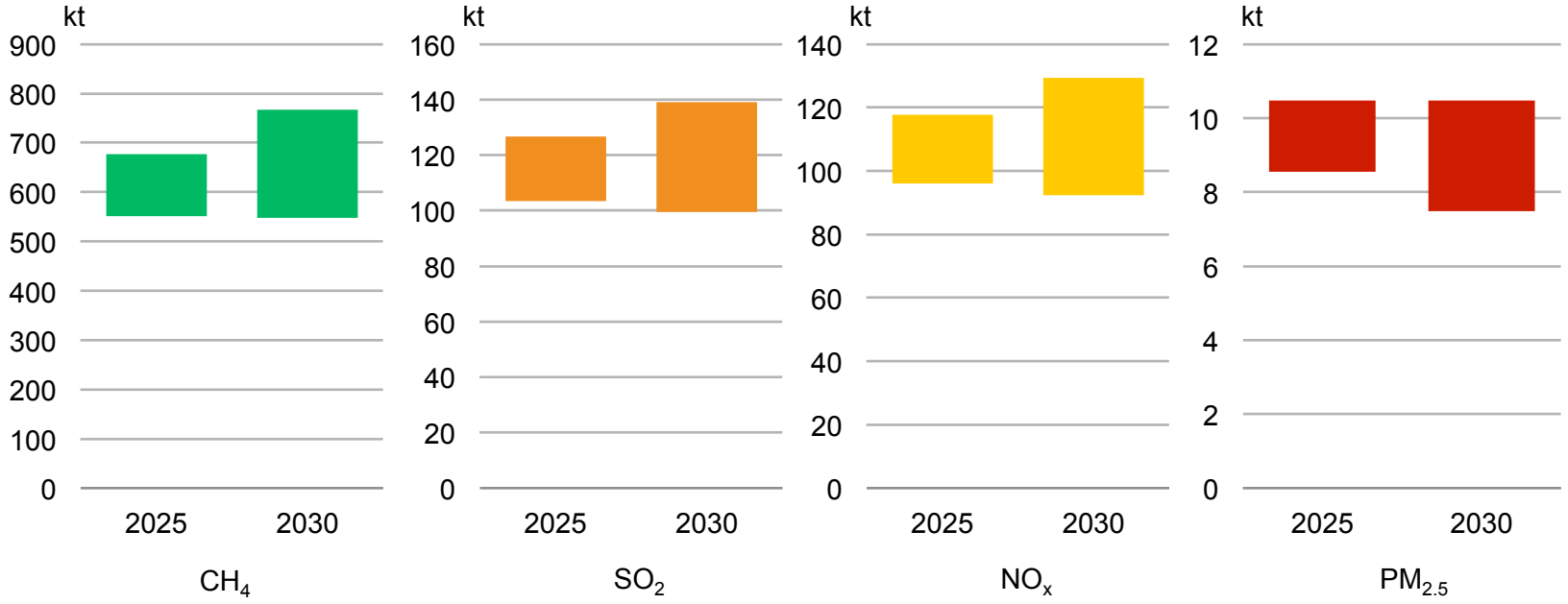
Power generation capacity for space cooling, 2017-30



The Efficient Cooling Scenario reduces power generation capacity needs by more than 50 GW, with the reduced capacity almost all in the form of fossil fuels.

…with benefits for health and local air quality

Range of air pollution reduction from Baseline to Efficient Cooling Scenario, 2025 and 2030



More efficient ACs and cleaner power can result in significant air quality improvements.

Recommendation to unlock energy-efficient cooling

- Encourage part-time and part-space cooling behaviour
- Raise energy performance standards
- Pay attention to real-time system operating efficiency
- Urge passive design and natural ventilation where possible
- Promote suitable indoor comfort levels
- Work with manufacturers to enable demand side response
- Consider refrigerant choice when addressing energy efficiency

Read more at: https://webstore.iea.org/the-future-of-cooling-in-china