



COUNTRY	POPULATION	NATIONAL EMISSIONS IN 2021	NATIONAL MITIGATION GOAL
INDONESIA	276.4 MILLION (2021)	597.38 MTCO <sub>2</sub> e	-29% CO <sub>2</sub> EMISSIONS IN 2030 (BAU BASELINE)

## Indonesia • Betting on reflective roofs to avoid air conditioning

In March 2022, an Indonesian team won the first prize in the [Million Cool Roofs Challenge](#) – an initiative launched by the Clean Cooling Collaborative (formerly K-CEP), SEforAll, the Global Cool Cities Alliance, and the Nesta foundation – for its reflective white roofs. The [Cool Roofs Indonesia](#) project helped to install white roofs on 70 buildings in 15 Indonesian cities. The various programme initiatives concluded that the installation of reflective roofing structures made it possible to reduce the ground temperature by at least [2 to 3 °C](#) and up to 10 °C in the case of some pilot projects in Indonesia. Access to cooling is a challenge across the domains of development, mitigation and adaptation, for both rural and urban populations.

### Access to cooling: a development challenge

Ten projects in the programme received \$125,000 in grants between August 2019 and August 2021 to reap results from various cooling and solar-reflective roofing approaches. The pilot projects were located in countries affected by [heat stress](#) (a condition where the body can no longer regulate its temperature, thus increasing the heart rate) and with poor access to cooling systems. On average, [between 1.8 and 4.1 billion](#) people are at risk of heat stress, particularly in India, South East Asia, and sub-Saharan Africa.

The Cool Roofs Challenge initiatives have established reflective roofs as development solutions because of the multiple [co-benefits](#) they bring. Cooling is critical for the food industry (in distribution and storage), the healthcare sector, and for quality of life in general. As such, the project also involved raising awareness about natural and “clean” cooling solutions, by creating about 100 jobs for low-skilled workers and promoting this solution in rural areas. The awareness-raising approach emphasised in particular the energy savings made possible by the reflective roofs, thereby highlighting the financial benefits for low-income households in precarious situations.

Developing countries are experiencing the [highest growth](#) in urbanisation. At the same time, cities concentrate the heat given off by buildings. Reflective roofs have demonstrated a [net effect](#) on reducing local temperatures when installed at a neighbourhood or community level.

### Energy savings as an adaptation measure

In South East Asia, only [15%](#) of homes have an air conditioning system and the majority of newly purchased air conditioners are two to three times less efficient than the best models available on the market. Among the Southeast Asian countries, Indonesia alone will account for [half](#) of the growth in the demand for air conditioners between 2020 and 2040. Of these countries, Indonesia and Cambodia had developed [National Cooling Action Plans](#), leading up to and ending in 2022. The objective of these plans was to identify actions that make it possible to reduce emissions from the energy consumption of air conditioning systems, and to expand access to cooling.

With the help of a producer and the municipality of Tangerang, the Cool Roofs project team from the *Universitas Pendidikan Indonesia (UPI)* developed rooftops that meet the [CRRC](#) standard in Indonesia. The goal was to offer roofing materials for a fraction of the price of other existing options. The pilot involved buildings from

the residential, government and private sectors, as well as schools and religious buildings. This diversity enhanced the richness of the results. About [10,250](#) people now benefit from these roofs.

The Indonesian project was one of the initiatives with the best reduction results of the programme: the temperature inside an industrial site dropped from [40 °C to 29.7 °C](#), and a school enjoyed a drop of 3 °C. Reflecting the sun during the day reduces the temperature differences of the building between day and night and between the dry and rainy seasons, which is critical for tropical climates. Coastal towns also have a greater chance of having inside temperatures exceeding 30 °C during the day. Improving thermal comfort thus helps to adapt to increasing climatic disruption.