

RENEWABLES IN CITIES

2021 GLOBAL STATUS REPORT

CITY



SIDEBAR 4. Frontrunners in Solar Thermal Mandates in Cities

Building codes are widely used as a way to improve the energy performance of new and refurbished buildings. In around 20 countries worldwide, codes also include requirements that a certain amount or share of hot water and/or space heating demand is met using renewable sources or specifically solar heat. These additional regulations are respectively called renewable and solar thermal mandates.

Over the last two decades, cities have taken the lead in implementing solar thermal mandates, using their regulatory authority to stipulate the use of solar thermal systems on buildings for heating and cooling to reduce local air pollution and achieve climate targets. Mandates force the construction sector to consider renewable energy technologies early in the planning process. Given the labour-intensive nature of the building sector, which is dominated largely by local businesses, this approach also creates local jobs.

As early as 2000, Barcelona (Spain) – Europe's pioneer in solar mandates – adapted its building code to require that solar thermal energy cover at least 60% of the hot water demand in new buildings and in buildings undergoing major renovation. This solar mandate has been the main driver behind Barcelona's emergence as a mature solar thermal market, with more than 96,000 m² of collector area installed by small local companies in the last two decades. The policy also spurred broader action as some 50 Spanish towns and cities followed Barcelona's example, culminating in the implementation of national technical building regulations in 2007.

In some countriesⁱ (such as Germany and South Africa), building codes or mandates are set at the national level, making new solar or other mandates binding at lower levels of governance as well. In such cases, the key role for municipal administrations is to effectively implement the national regulation. In South Africa, a new building standard came into force in September 2011 (followed by a six-month transition period) stipulating that a minimum 50% of annual hot water demand must be provided by means other than electric resistance heating and fossil fuels. The city of Cape Town was able to fully apply the standard from April 2012 onwards, whereas other municipalities delayed the implementation by several years (→ see *Feature chapter*).

The experience of Bengaluru, the capital of Karnataka state (India), illustrates how strict implementation rules increase the effectiveness of solar mandates. To combat chronic power shortage, Karnataka enacted a solar mandate in 2007 requiring developers to install solar water heaters in all dwellings with at least 600 square feet (56 m²) of floor space. Two years later, the municipal utility Bangalore Electricity

Supply Company (BESCOM) started denying grid access to households that were not equipped with a solar water heater. This strict compliance rule led to 1,234 million m² of collector area installed across the city by 2017. BESCOM's policy was copied by other utilities across Karnataka, making it the leading Indian state for solar water heater capacity.

In countries where building codes can be set at the local level, several cities have emerged as frontrunners in solar thermal ambition, despite facing challenges. In 2007, São Paulo was among Brazil's first cities to enforce a solar mandate (applicable to all new residential and non-residential buildings), and by 2015 more than 110,000 m² of collector area had been installed across the city. Rosario (Argentina) is one of the few towns/cities in that country to have established a solar mandate (adopted in 2012), requiring 50% of hot water consumption in public buildings to be covered by solar thermal systems.



Some cities have pioneered stricter standards or requirements than those set at higher levels of government. In 2019, Honolulu (Hawaii, US) issued a stricter solar mandate, applying also to town halls and condominiums, than the overall state mandate for residential buildings that has been in force since 2010. The Hawaii mandate was the first on the continent and resulted in a high solar thermal penetration in buildings, with one in every two single-family houses using solar-heated water.

Source: See endnote 167 for this chapter.

ⁱ Solar mandates at the national level have proven to be able to boost solar thermal markets. Famously, in response to the oil crisis of the 1970s, Israel mandated the installation of solar water heaters in new residential buildings. Today, residential solar thermal systems are standard in the country, with 85% of households showering with solar energy. In Australia, a solar mandate issued in Victoria in 2005 requires residential home owners to install either a solar water heater or a rainwater tank for toilet flushing; 15 years later, 70% of new houses in the province have solar hot water systems.