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Türkiye could install 120 GW solar on available rooftops, ten times its current solar capacity

[Istanbul, 11 December 2023] New analysis from think tank Ember finds that Türkiye has a potential rooftop solar capacity of over 120 GW, or ten times the country's current solar capacity. The capacity potential is more than the total solar rooftop capacity added worldwide in 2022 (118 GW).

Delivering 120 GW of rooftop capacity would mean 148 TWh potential generation a year, equivalent to 45% of Türkiye's total electricity consumption in 2022.

The study uses analysis of high resolution satellite images in 70 provinces of Türkiye to calculate technical potential across available rooftops. The analysis takes into account the maximum generation potential of each rooftop, applying additional corrections based on angles and roof type.

Türkiye has a higher solar energy potential than most European countries, but currently lags behind in its share of solar electricity. In 2022, Türkiye generated 4.86% (15.84 TWh) from solar, far below countries with lower potential and smaller surface areas such as the Netherlands 14.26% (17.29 TWh) and Germany 10.71% (60.01 TWh).

Rooftop solar has seen a huge boost in many European countries in recent years. Despite its limited land area, the Netherlands has become a leader in solar generation, thanks to a mix of policies, including net metering, subsidies, feed-in tariffs, and tax incentives. In the country 40% of solar electricity production is obtained from residential rooftops. Meanwhile, in Germany roofs host over 60% of the newly solar power plants each year. Overall, EU countries stand out in this regard, with 66% of total solar installed capacity on rooftops.

Ufuk Alparslan, Ember Regional Lead, said "Rooftops are prioritised in energy transition policies across the world - and for good reason. Türkiye, which has ambitious solar targets, has a rooftop potential almost ten times its installed solar capacity. In addition to the current potential of roofs, tens of thousands of new buildings are being constructed every year in Türkiye with the rebuilding effort in the earthquake zone raising this figure even higher. Introducing rooftop solar obligations for new buildings and public buildings, and the tendering of suitable apartment building roof areas by municipalities can both help Türkiye achieve its energy targets and enable people to generate their own electricity cheaply"

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Notes to the editor

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Methodology

The study calculates Türkiye's technical potential of rooftop solar through an analysis of high resolution satellite images. Satellite images of roofs in 70 provinces were analysed and roofs were categorised based on their suitability for solar panels. The remaining 11 provinces declared disaster areas after the February 2023 earthquake were excluded. Microsoft Building Footprints database was used to identify roofs across the country and Google Earth Engine software was used to analyze satellite images.

About Ember

We are an independent energy think tank that aims to accelerate the clean energy transition with data and policy. We gather, curate and analyse data on the power sector and coal mine methane emissions, publishing this openly and accessibly. We use our data-driven insights to shift the conversation towards high-impact policies and empower other advocates to do the same. Ember-climate.org