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Young Green Fabian Wagner attended the COP 22 negotiations in Marrakesh and found that despite the host"s eagerness to project itself as a constructive force in the fight against climate change, its policies in other areas raise serious concerns - not least the levels of repression around the question of Western Sahara.

Morocco certainly did not hold back in terms of advertising its efforts to become a country powered by renewable energy during the COP22. Only the most oblivious of visitors could have missed the banners at the airport, posters in the city, ads on horse carriages, and stickers on cars. Wind power, solar power -- Morocco is transitioning towards clean energy at a very quick pace.

Fig. 1 (left): A map featured on the COP22 website shows the planned and realised renewable energy projects on what Morocco considers its territory. A significant amount of the projects are located in Western Sahara, which is not marked on this map, as usual in Moroccan maps.

Fig. 2 (right): Wind energy is a lucrative business with this map from the Moroccan Investment Development Agency clearly showing the potential of Western Saharan territory in this sector.

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The world"s most forbidding deserts could be the best places on Earth for harvesting solar power - the most abundant and clean source of energy we have. Deserts are spacious, relatively flat, rich in silicon - the raw material for the semiconductors from which solar cells are made -- and never short of sunlight. In fact, the ten largest solar plants around the world are all located in deserts or dry regions.

Researchers imagine it might be possible to transform the world"s largest desert, the Sahara, into a giant solar farm, capable of meeting four times the world"s current energy demand. Blueprints have been drawn up for projects in Tunisia and Morocco that would supply electricity for millions of households in Europe.

While the black surfaces of solar panels absorb most of the sunlight that reaches them, only a fraction (around 15%) of that incoming energy gets converted to electricity. The rest is returned to the environment as heat. The panels are usually much darker than the ground they cover, so a vast expanse of solar cells will absorb a

lot of additional energy and emit it as heat, affecting the climate.

If these effects were only local, they might not matter in a sparsely populated and barren desert. But the scale of the installations that would be needed to make a dent in the world"s fossil energy demand would be vast, covering thousands of square kilometres. Heat re-emitted from an area this size will be redistributed by the flow of air in the atmosphere, having regional and even global effects on the climate.

A 2018 study used a climate model to simulate the effects of lower albedo on the land surface of deserts caused by installing massive solar farms. Albedo is a measure of how well surfaces reflect sunlight. Sand, for example, is much more reflective than a solar panel and so has a higher albedo.

The model revealed that when the size of the solar farm reaches 20% of the total area of the Sahara, it triggers a feedback loop. Heat emitted by the darker solar panels (compared to the highly reflective desert soil) creates a steep temperature difference between the land and the surrounding oceans that ultimately lowers surface air pressure and causes moist air to rise and condense into raindrops. With more monsoon rainfall, plants grow and the desert reflects less of the sun"s energy, since vegetation absorbs light better than sand and soil. With more plants present, more water is evaporated, creating a more humid environment that causes vegetation to spread.