

1 High-tech energy oasis to be built in the desert

2
3 A **renewable-energy** "oasis" planned to be built in 2010 may serve as a proving ground for new technologies designed to
4 bring green living to the desert. The planned research center is part of the Sahara Forest Project—but that doesn't mean it
5 will be built in Africa. Sahara means "desert" in Arabic, and the center is meant to be a **small-scale** version of **massive**
6 green complexes that project managers hope to build in deserts around **the globe**. Experts are now **examining** dry sites in
7 Australia, the U.S., the Middle East, and Africa that could support the test **facility**. "The Sahara Forest Project is a holistic
8 **approach** for creation of local jobs, food, water, and energy, **utilizing** relatively simple **solutions** mimicking design and
9 principles from nature," said Frederic Hauge, founder and president of the Norwegian environmental **nonprofit** the
10 Bellona Foundation. For instance, special **greenhouses** would use hot desert air and seawater make fresh water for
11 growing crops, solar energy would be collected to generate power, and algae pools would offer a **renewable** and easily
12 transportable fuel supply. In addition, planting trees near the complex would **trap** atmospheric greenhouse gases such as
13 carbon dioxide while restoring any natural forest cover that has been lost to **drought** and timber **harvesting**. "From my
14 perspective as an environmentalist, this could be a game changer in how we produce biomass for food and energy, and
15 how we're going to provide fresh water for the future," Hauge said. But not all experts are as enthusiastic about the
16 project. In terms of the reforestation plans, "trying to grow trees in the Sahara desert is not the most **appropriate**
17 approach," said Patrick Gonzalez, a forest ecologist at the University of California, Berkeley's Center for Forestry. After
18 all, even though it was **literally** green in the past, the Sahara was never heavily forested. "I can imagine that this scheme
19 and type of technology in limited cases might work in certain areas like Dubai, where they're used to making palm-shaped
20 islands and 160-story-tall buildings," Gonzalez said. If the goal is **restoring** a desert's natural ecosystem, however, "it
21 would be more effective to work with local people on community-based natural-**resource** management."
22

23 From Mirage to Reality

24 The Bellona Foundation's Hauge **counters** that replanting trees—even in a desert—is an uncontroversial **measure** for
25 stopping desertification and combating climate change. In fact, tree-planting is one of the strategies that the foundation
26 and its partners have carefully studied as part of their **efforts** to make the Sahara Forest Project more than a mirage. The
27 project's members are conducting **feasibility** studies in several countries, the **initial** results of which were presented in
28 December 2009 at the Copenhagen climate conference. And the testing center slated for **imminent** construction should
29 provide even more data on how well the project's suite of green technologies might work in real life. So-called seawater
30 greenhouses, for example, are basic and cheap, making them a cornerstone of the project. Hot desert air going into a
31 greenhouse is first cooled and humidified by seawater. This **humid** air **nourishes** crops growing inside the greenhouse,
32 then passes through an evaporator, where sun-heated seawater flows. When the now warm humid air meets a series of
33 tubes **containing** cool seawater, fresh water condenses as droplets on the outsides of the tubes and can be collected. The
34 process **mimics** a natural process: Sun-heated seawater **evaporates**, cools to form clouds, and then falls as **precipitation**.
35 Only 10 to 15 percent of the humid air gets condensed into fresh water. The rest flows outside to water **surrounding** trees,
36 so that the "greenhouse will create a large area around it that will be become green," according to Hauge. The center will
37 also test the use of concentrated solar power, which uses mirrors to **focus** sunlight on water pipes and boilers. The
38 concentrated light creates superheated **steam** inside the pipes that can power **conventional** steam turbines, generating
39 electricity. Any power not used to run the complex can be sent to local communities. Likewise, biomass-based **fuel** from
40 the center's photobioreactors would be easy to export, Hauge said. The ponds would cultivate algae through
41 photosynthesis in open, **shallow** saltwater pools. The algae's fatty oils could then be harvested as energy-rich biofuel. Lab-
42 grown algae have been shown to generate up to 30 times more oil per acre than other plants used to make biofuels,
43 according to the National Renewable Energy Laboratory. And farming algae in pools doesn't take up **valuable** agricultural
44 land, Hauge said.

45
46 Adapted from: [The National Geographic](#)