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Abu Dhabi plots hydrogen future  
By Richard Black

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#### Green city planned for the desert

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The government of Abu Dhabi has announced a \$15bn (£7.5bn) initiative to develop clean energy technologies.

The Gulf state describes the five-year initiative as "the most ambitious sustainability project ever launched by a government".

Components will include the world's largest hydrogen power plant.

The government has also announced plans for a "sustainable city", housing about 50,000 people, that will produce no greenhouse gases and contain no cars.

The \$15bn fund, which the state hopes will lead to international joint ventures involving much more money, is being channelled through the Masdar Initiative, a company established to develop and commercialise clean energy technologies.

It shows that you can generate hydrogen without carbon release from fossil fuels  
Professor Keith Guy

Powering up for hydrogen

"As global demand for energy continues to expand, and as climate change becomes a real and growing concern, the time has come to look to the future," said Masdar CEO Dr Sultan Al Jaber.

"Our ability to adapt and respond to these realities will ensure that Abu Dhabi's global energy leadership as well as our own growth and development continues."

Technology bridge

The portfolio of technologies eligible for funding under the Masdar Initiative is extensive, but solar energy is likely to be a major beneficiary.

The hydrogen plant, meanwhile, will link the world's currently dominant technology, fossil fuel burning, with two technologies likely to be important in a low-carbon future - carbon sequestration and hydrogen manufacture.

Hydrogen will be manufactured from natural gas by reactions involving steam, producing a mixture of hydrogen and carbon dioxide.

President Bush at hydrogen pump. Image: AFP/Getty

President Bush's administration is also pumping money into hydrogen

The CO2 can be pumped underground, either simply to store it away permanently or as a way of extracting more oil from existing wells, using the high-pressure gas to force more of the black gold to the surface.

When hydrogen is burned, it produces no CO2. Eventually hydrogen made this way could be used in vehicles, though in Abu Dhabi it will generate electricity.

"It's important because it shows that you can generate hydrogen without carbon release from fossil fuels," commented Keith Guy, an engineering consultant and professor at the UK's Bath University.

"When you look at how hydrogen could be made economically, the route that many people have been looking at, through electrolysis of water, is incredibly expensive."

The Masdar Sustainable City, another component of the Abu Dhabi government's plans which is being designed with input from the environmental group WWF, is envisaged as a self-contained car-free zone where all energy will come from renewable resources, principally solar panels to generate electricity.

Buildings will be constructed to allow air in but keep the Sun's heat out. Wind towers will ventilate homes and offices using natural convection.

The fund and the Masdar City plans were formally unveiled at the World Future Energy Summit in Abu Dhabi.