



Engineer in Race to Develop Oil Alternative

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JOHN MACLEAY reports

CALIFORNIAN solar engineer Ron Swenson believes in working on technologies that could one day provide a substitute for oil - and bringing them on-stream in a reasonable time frame - instead of hand-wringing over dwindling reserves.

Swenson - in Australia to participate in the Solar Challenge electric-solar car race - has been a keen exponent of alternatives to oil since the late 1960s. He credits his interest to the legendary futurist Buckminster Fuller, who was a visiting fellow at the San Jose State College when Swenson was lecturing there in engineering.

"The important thing to look at is how to maintain the transportation system," he says. "While there will be tele-commuting, mass transportation and conversion to rail, there will also be mechanisms for autonomous electric vehicles that will be charged by solar panels.

"Sacramento, the capital of California, already has a recharging station for solar vehicles, comprising a series of solar panels. In the peak of summer, the station can deliver power for as many as 500 vehicle-kilometres.

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Spurred by environmental concerns, California has mandated that by 2003 at least 10 per cent of new vehicles in the State must be electric-powered.

According to Swenson, while photovoltaics (the provision of a potential source of electric current under the influence of light or similar radiation) have not been economic up until now, a recent breakthrough in silicon-wafer technology allows as many as 425 watts of electricity to be generated from a 2.5 cm panel, compared with just one watt previously. [*note: The reporter refers here to small concentrating cells which can be cut from a larger cell and when assembled would be placed under a much larger surface area of concentrating lenses.*]

Swenson says previous flat-plate solar panels have not been financially attractive because it typically took up to eight years just to recover the energy invested in making the device.

"If it takes eight years to recapture the energy investment, it will take between 20 years and infinity to get back your money," he says. "But (with the new system) you can get the energy recovery down to two years.

"If I can pay for my kilowatt hours, then I can start to pay for my capital costs, my equipment costs, overheads and, finally, my profit.

"Swenson sees flat-panel technology as a possibility for housing, especially in roofing. It costs between \$1 and \$2 per watt incrementally to put the panels in place. The incorporation of panels into the building structure eliminates the need to amortise the solar components separately.

As president of Santa Cruz-based renewable energy consultancy Eco Systems Inc, Swenson is putting his money where his mouth is as a support driver for a Mexican team in the Solar Challenge, which runs from Darwin to Adelaide and begins next week.

He also follows the work of petroleum geologists Petroconsultants and, while passing through Sydney this week, held meetings with NSW Government officials about the need to become aware of global oil depletion.

He says one of the biggest barriers to the introduction of solar technology, apart from beliefs that it costs too much and that the necessary technology is not available, is the mindset that there is no end in sight to the availability of oil.

"It's quite shocking to think that within a few years the cheap oil is going to run out," he says.

"The impression I was given was that it was a bit overwhelming because it really isn't common knowledge."

Swenson says that while nonconventional oil from sources such as shale and tar would come into use as the price of crude oil rises, it would account for possibly no more than 20-30 per cent of total production because of the scale of conversion and the high energy costs involved in its extraction.