



This article was commissioned in the early 2000s to increase understanding and acceptance of improving solar energy technology, specifically regarding its potential impact in South Australia. It was included as part of a larger newsletter.

THE CASE FOR SOLAR TECHNOLOGY IN SOUTH AUSTRALIA

Solar power is expected to be a major energy source for the future. Today, solar energy supplies electric power to hundreds of thousands of people worldwide. More than ten thousand people are employed in the solar energy market which produces revenues of at least \$1 billion. The advantages of solar power are obvious. It is an abundant, non-polluting, and free energy resource.

The sun provides the earth with 10,000 times more energy than its people consume; however, this resource remains essentially unexploited.

“Solar power is a prime choice in developing an affordable, feasible, global power source that is able to substitute for fossil fuels in all climate zones around the world,” said Solar Generation, a report put out by Greenpeace in 2003.

To understand its potential impact in South Australia, it’s important to know how this technology works, how efficient it is, and its possibilities for the future, particularly in South Australia.

Solar power works through what are termed photovoltaic (PV) cells. These cells are becoming increasingly more refined thanks to new technologies being developed around the world.

Basically, PV cells consist of a positive and a negative slice of silicon. These are housed under a thin plate of glass. As photons carried in sunlight hit the PV cell, they knock electrons off the silicon. The negatively charged free electrons are attracted to the silicon but are prevented from attaching by the magnetic field formed from the opposing polarities between the two slices. Small wires attached to the silicon creating a circuit catch the free electrons and an electric current is formed” (Lenkefi, 2005).

Current solar technology in South Australia is primarily found in the market of solar water heaters with nearly 5 percent of homes employing them. Unfortunately, as Melissa Fyfe explains in *The Age* (2003), the use of solar panels to generate home electricity, which has never been in high demand, has been declining in recent years.

Part of the problem of trying to encourage people to invest in solar energy is the expense of installation as compared to the payoff. Although many governments, including that in South Australia, have offered various types of rebate packages to encourage investment in the technology and thus hopefully drive the price down to a more competitive figure, the effects of these types of programs have not been significant enough in Australia. With the average cost of a grid-connected PV system coming in at around \$14,000 even after a \$7,500 government rebate, most people still consider the experiment too costly.

At the same time, solar panels have not been reliable enough to give people faith in the technology. According to Fyfe, “Solar panels rarely provide the total energy needs of a house, but if people have solar hot water and are energy efficient, the panels can provide the bulk of it” (Fyfe, 2003).

Understanding the immense potential solar power presents and concerned the technology is being abandoned mostly because of its expense, some companies, such as Origin Energy and Pacific Solar, began work on new technologies. Our mission is to reduce the need for expensive materials and thus drive the overall cost of solar panels down while increasing its overall efficiency. Not only do we intend a rooftop array to provide the full energy needs of the house, but we anticipate these systems to generate

enough additional energy to contribute to the main power grid. Instead of paying for electricity, homeowners could receive checks for their excess.

South Australia should have a strong interest in developing solar power technology. It's one way we can compete with an increasing global marketplace, as a means of reducing greenhouse gases, and as a means of more effectively meeting the needs of a growing urban population while protecting our environment.

Speaking specifically about South Australian cities, Jeffrey Gordon (2001) reports, "the increased industrialization and urbanization of recent years have dramatically affected the number of urban buildings leading to major effects on the energy consumption of this sector." This is true around the world, not just in Australia.

It is known that larger cities create what are called 'heat islands' in which increasing amounts of energy are required to keep buildings and people cool and operational. All the heat generated by that energy consumption has to go somewhere, heating up urban areas significantly more than surrounding rural areas.

In addition, South Australia's already over-extended power grid will not be able to keep up with the demands of this type of urban growth unless more households and companies can be enticed to install solar panels and begin feeding back into the power grid.

While it is unlikely that solar power will be able to completely replace the burning of coal or gas in the immediate future, the development of more efficient and less costly technologies can help to alleviate some of the present concerns over global warming.

Used in conjunction with other sustainable energy generation, such as geothermal energy or wind energy, solar energy may be capable of reducing the tremendous drain on national power grids while continuing to provide citizens with the quality of life to which they've become accustomed. With other efforts, such as alternative means of transportation that do not burn fossil fuels, these sustainable energy sources can eventually reach the level of development that can replace fossil fuel energy creation.

However, if the government and the citizens do not support these technologies now, while still in their infancy and perhaps not at their greatest level of effect, there will be no funding available to bring about this higher level of development in the near-term (10-15 years).

It is imperative for all nations of the world to reduce the effects of greenhouse gases on our atmosphere, particularly for developed nations to concentrate on new means of acquiring the energy needed to power large urban centers even during peak hours. Although solar power isn't completely reliable, affordable, or able to completely replace older forms of energy production yet, it is one step in the right direction for South Australia, economically, culturally, and globally.

Sources used in this article:

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