

# The built-in barriers to more widespread use of solar energy

By BRIAN MARTIN\*

**SOLAR** energy, wind power and energy conservation are today technically proven and economically competitive for satisfying many of our energy needs. This is true in spite of the relative lack of research into these possibilities, compared with the massive efforts devoted to nuclear fission and fusion.

There is the beginning of a boom in the use of domestic solar-heating and energy-conservation measures. Even so, such applications do not reflect the great advantages of conserving energy and using renewable energy sources.

The reason for this is the existence of barriers, barriers which make it harder for alternative technologies to compete with traditional ones.

One disadvantage for the "soft" technologies is the subsidies given to existing energy sources. These sub-

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sidies are most widespread in the nuclear industry: provision of low-cost enrichment capacity from weapons programs, lack of full insurance for reactor accidents, and no full accounting for the future cost of managing radioactive waste.

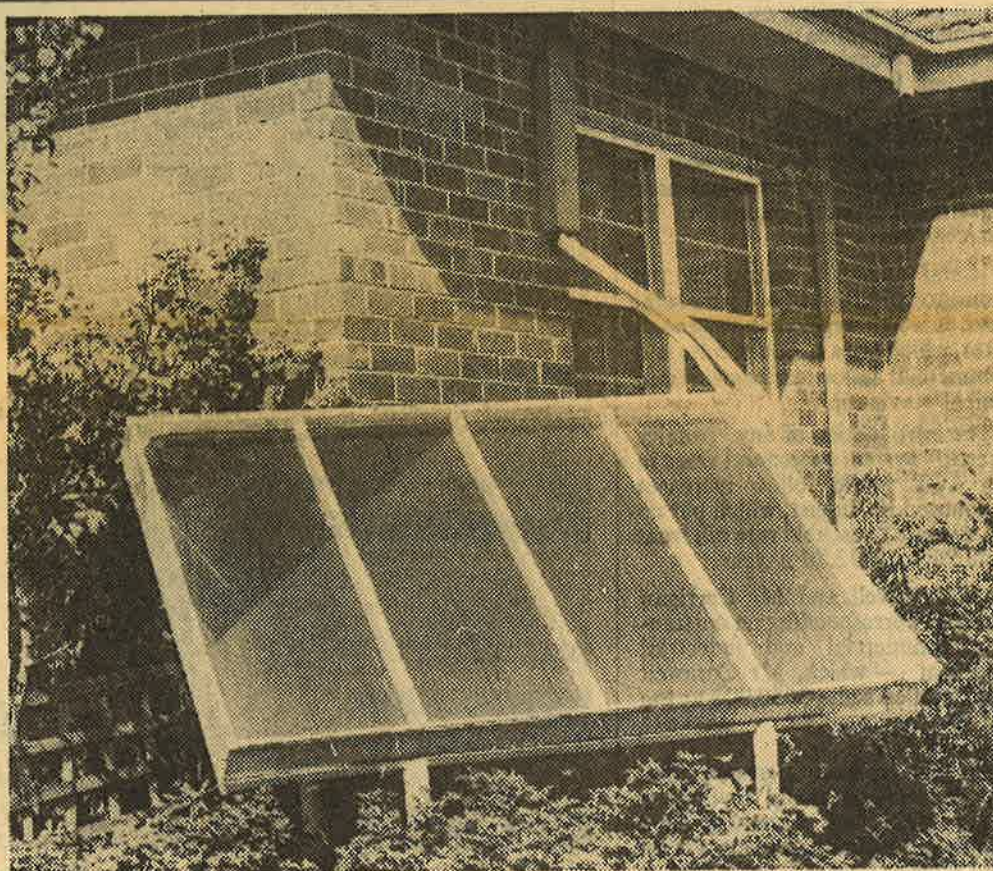
In general, fossil and nuclear-energy sources have not usually had to pay for their environmental side-effects. For example, carbon dioxide released from the burning of coal and oil may be altering the future climate by causing the earth's atmosphere to trap more of the sun's heat, but this effect is not included in the cost of using coal and oil.

Energy conservation and solar and wind energy have had few subsidies. They also have only very tiny environmental effects, but are disadvantaged compared with the more polluting fossil and nuclear fuels.

Another unfair advantage given to fossil fuels is that they are not priced according to their scarcity as a finite resource, but only according to what it costs to get them to the consumer.

Fossil-fuel resources can be likened to financial capital, whereas energy from sun, wind, and plants is like income. To spend one's capital at a rapid rate is obviously a more serious matter than spending one's income, at least if one cares about the future.

A better way to value limited energy resources is according to what it would cost to replace them when they are gone. This would greatly increase the price of oil, coal, and uranium, and immediately make the energy income from the sun, wind, and plants much more attractive.



A simple solar water heater collection plate which has been working efficiently in Canberra for many years.



There is an enormous infrastructure of production and distribution facilities and consumer goods which promotes heavy use of energy as supplied by present-day sources.

This infrastructure consists of oil refineries, petrol stations, roads and automobile plants, of hydro-electric stations, electrical grids and household appliances, and of poorly insulated buildings, inefficient production facilities and goods designed for premature obsolescence. These parts of our humanly constructed environment encourage energy use, and ensure that the energy used is from the standard sources provided.

In other words, the existing investment in everything from toasters to oil wells is a strong incentive to keep using those investments in the way they were designed.

Alternative energy sources will not fulfil their full promise until a new infrastructure is developed: buildings constructed for conserving energy and collecting solar heat; communities designed around a reduced need for unnecessary travel, and geared for public transport and bicycles; and facilities for production of energy converters using sun, wind, and organic materials.

A new infrastructure cannot of course be developed overnight. But unless the community makes a conscious decision about the sort of energy future it desires, the existing investment in the present infrastructure will tend to perpetuate itself and justify a delay in introducing alternatives.

Perhaps the greatest barrier to energy conservation and renewable energy sources is the existence of organisations geared to the present way of doing things. Examples of these organisations are oil companies, main roads departments, appliance manufacturers and electrical utilities.

Organisations have a vested interest in their own survival and growth, and therefore look to the satisfaction of needs in terms of their own capabilities.

Also important are rules, which enable organisations to operate and prosper. Rules, for example, specify how money can be raised (for capital works such as roads and hydro-electric schemes), regulate standards for electrical installations in buildings, and set depreciation rates for equipment.

For solar space heating by small local collectors to really achieve its promise, there will need to be new organisations and rules. There will need to be new manufacturing organisations (which might include neighbourhood production units), and there will need to be changes in the building trades and in planning ordinances to ensure that buildings benefit from maximum use of the sun's rays.

Local solar heating would be much cheaper and more reliable if a large heat reservoir were provided — serving perhaps ten households — to provide protection against periods of bad weather. This would be promoted more easily through new social arrangements for local co-operation, as well as new rules covering economic responsibility (such as exist, though not optimally, for those who live in flats now).

## Change

There are many similar examples. The success of recycling may depend on community groups organising the re-use of resources. Cutting down on the production of excess goods may require community groups which arrange for communal facilities, co-ordinate transport, and share knowledge (the neighbour down the street may have the skill or spare part to fix your stove).

The change to renewable energy sources will not occur easily. New organisational relationships will need to be created, and there will be great resistance from existing organisations with their vested interests.

Most telling of all will be the built-in advantages of policies which are in tune with present organisational arrangements and the rules governing them. This is because economic and technical comparisons are determined, to a large degree, by the organisational framework.

Electricity from a centralised grid is easy to promote **not** because electricity is relatively cheap nor because of a lack of alternatives.

Instead, electricity from a centralised grid is easy to promote because electrical utilities are allowed to offer graded rates encouraging heavy electricity use and are allowed to finance massive plants from future earnings, because building trades and regulations make it automatic to hook up to the electrical grid, because appliances are built to be dependent on the grid, and because there has been little research into and promotion of the decentralised use of renewable energy sources.

In short, a simple economic or technical comparison between different energy futures is misleading, because of subsidies and because of an infrastructure and organisations geared towards the present way of doing things. The choice of an energy future is, fundamentally, a social and political choice, and therefore should involve all concerned citizens in the decision-making process.

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## VICE-REGAL

The Governor-General, Sir Zelman Cowen, received the following callers at Government House yesterday afternoon: the Prime Minister, Mr Fraser, Mr J. D. Anthony, Deputy Prime Minister, Minister for National Resources and Minister for Overseas Trade; and Mr L. W. Johnson, the Australian Ambassador to Greece.

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