...and Claire Gerson thinks unions and the industry have a lot to learn in the struggle to green the power industry.

We're so used to associating electricity with the 'good life' that, until recently, there's been an almost blind acceptance that achieving a high standard of living is inextricably bound up with consuming more electricity. Or—as economists would have it—that an inflexible link exists between energy consumption and economic growth.

This notion is central to what has been called the ideology of electrification, which makes electricity the vital agent and ingredient of the progress and development that bring efficiency, modernity and the 'good life'. Its influence has waned somewhat now that most households and enterprises are connected to the state electricity grids: but it's an ideology that remains firmly entrenched within the organisational structure and managerial culture of electricity authorities, despite recent attempts to modify them.

A profound faith in the doctrine 'more is better' has also been part and parcel of developmentalism, a set of beliefs that has been particularly potent among state governments. State energy policies have shown a marked preference for expanding supply—building more power stations—to the neglect of any serious consideration of conservation or efficiency methods. Hence the unbridled enthusiasm for large new mines, oil fields, aluminium smelters and ever bigger power stations.

In this conception of the world, the environmental and sociopolitical costs of energy used for heating, lighting, cooking and industrial processes are considered local nuisances or temporary inconveniences. The most notable example of this was the Franklin Dam dispute. The controversial proposed Tully-Millstream hydro-electric scheme is shaping up as a dispute of similar magnitude—an unnecessary power industry project in an area that already has World Heritage listing.

Since the 1973 oil crisis many OECD countries—such as Japan and what used to be West Germany—have reduced their energy consumption. This is partly due to a shift away from manufacturing to service industries in those national economies—but also because the industries in those countries use lighter materials and more efficient industrial processes and technologies. In the meantime, their economies have continued to grow, demonstrating that there is no fixed link between economic growth and energy consumption.

The oil crisis helped stir up an extensive debate about energy use and the possibilities offered by renewable energy technologies and conservation strategies. However, public interest in the issue didn't survive the subsequent oil glut and drop in energy prices and for some years the debate became the province of technical specialists. Or at least that was the case until concern about the 'greenhouse effect' in the late 1980s heightened public awareness that global development was proceeding along an unsustainable path.

The consequences of the 'greenhouse effect' are of course by no means a matter of consensus. But while many of the issues are fraught with uncertainties and may take years to resolve, it's now generally accepted that burning fossil fuels contributes more carbon dioxide than any other activity, including deforestation.
Coal is by far the most abundant and accessible fossil fuel source in Australia and coal-fired power stations supply the bulk of Australia’s electricity. Until the greenhouse effect became an issue, coal appeared to be a cheap and ideal fuel source for electricity generation. Coal combustion results in more carbon dioxide emission per unit of energy than any other fossil fuel. Black coal used in electricity generation typically releases approximately 25% more carbon dioxide than oil and 50% more than natural gas for the same amount of heat.

Carbon dioxide is less harmful than the other greenhouse gases, but because it exists in such large quantities compared with methane, nitrous oxide or CFCs, its impact is more significant. It’s clearly extremely difficult to reduce methane and nitrous oxide emissions from cows and rice paddies, but there are numerous options when it comes to reducing fossil fuel use.

Expensive energy technologies can prevent carbon dioxide escaping into the atmosphere after fossil fuels have been burnt, and coal can be cleaned of unwanted contaminants and converted to gas. There is, however, a much simpler approach which recognises that industrial economies don’t use electricity in an efficient or sustainable way. So it makes a lot more sense to reduce the amounts of fossil fuels that are consumed in the first place. In other words, it may cost less to encourage people to reduce the amount of power they consume than it does to follow supply side options and build more power stations. This path has been tried overseas but it has been slow to catch on here, and electricity authorities have shown a marked reluctance to incorporate these demand side measures.

The spread of energy efficient and renewable energy technologies in Australia has been blocked by non-technical barriers and by a low level of research funding. By 1990, Commonwealth grants for the research, development and demonstration of renewable energy had declined in real terms to one-eighth their original value in 1978. Although there are no serious plans to use nuclear power here, the total government expenditure on nuclear energy related research has been almost double the total amount spent on all forms of renewable energy.

The engineering branches of electricity authorities commonly foster an indifference and resistance to efficient and renewable energy options. Australian energy planners are usually trained in conventional technologies based upon economies of scale—economies which have been used to generate cheap electricity from fossil fuels, but which don’t work for renewable energy. It’s consequently difficult for these planners to conceive that future energy needs can be met through energy efficiency and conservation together with renewable energy technologies. They also appear unwilling to learn from their colleagues elsewhere in the world who have adopted demand side measures.

Indeed, the overseas record of efficient and environmentally-informed energy technologies is by now a very impressive one. In the United States, energy utilities have actively marketed energy efficiency technologies and services as a cheaper alternative to building more power stations. In any case, the construction of new power stations also involves substantial economic risks when trends in demand are uncertain.

California, for example, has pursued a policy of strict conservation standards for all sectors of its economy since 1977. This has involved reforming the state’s electric utilities so that they are now not only profitable, but also more environmentally sound. Tough energy standards have been enforced that limit the amount of electricity used by fridges, airconditioners, heat pumps and hot water heaters. Consumers receive cash rebates from the utilities to encourage them to buy energy-efficient appliances. As a result, inefficient versions of these appliances are no longer on sale.

Nor was the strategy limited to electrical products themselves. Building codes were introduced that ensured better insulation in new homes and office buildings, thereby reducing waste heat. Low income customers were given compact fluorescent lightbulbs and low interest loans for home insulation to help reduce the amount of electricity they consumed without exacerbating already existing social inequalities.

Californian energy utilities have spent almost $A2.4 billion reducing their customers’ energy use. They’ve also avoided building $12 billion worth of new power plants to keep up with uncontrolled electricity demand. They’ve changed from selling as many units of electricity as possible, and now provide energy services. In the process, California has become a proving ground for renewable energy technologies with 16,000 wind generators feeding into the electricity grid and commercially producing solar thermal energy from parabolic trough solar concentrators.

The Californian experience has contradicted the forecasts of US energy planners. In the early 1970s, planners were ignorant of the potential for conservation, and based their projections upon the assumption that supply would have to continue to expand to meet an expected doubling of demand every ten years. As a result of California’s far sightedness, the state has maintained its standard of living while reducing its use of electricity per unit of output by 17%—and its state economy is now more competitive both nationally and internationally.

Denmark is another country which has followed the demand side path and moved away from a dependence upon imported oil towards an energy policy that aims at self-sufficiency. Between 1975 and 1990 Denmark invested $A4 billion into efficient uses of energy and wind power. The Danes had the foresight to include energy requirements in their building codes in 1967, which has saved them around $A2.5 billion per decade.

Denmark has also sponsored a high level of investment in more energy-efficient forms of home insulation, lighting and appliances. Indeed, while subsidies for domestic energy efficiency were phased out in the early 1980s, the level
of investment hasn’t diminished—which suggests a continuing high level of public awareness.

New industries are planned in clusters, so as to make better use of the waste heat they generate. Now, about 75% of Denmark’s electricity needs are produced by ‘combined heat and power’ plants which use the heat generated by the power generation process itself to produce more heat. Wind turbines provide 4% of the country’s electricity supply, and the wind power industry now generates $A200 million in export earnings. Wind power was evaluated on the assumption that it costs the same as fossil fuels if the environmental costs of fossil fuels are taken into account.

The Danes have managed to found their energy policy from a broad-based social and political consensus, so that changes of government are not associated with changes of energy policy direction. The energy question in Denmark also opened up a whole area of social debate which changed the selection process used in evaluating projects. Rather than focusing narrowly on the cost of investment, the Danish evaluation process includes consideration of global and social impacts and health effects. Moreover, the decision-making process has now devolved to individual communities, which are able to choose which forms of energy they will use and whether or not to connect with the existing grid. It’s a very resilient system that allows for decentralised energy communities and provides an interesting contrast with a large centralised political bloc such as that fostered by NSW’s Elcom.

In 1989, the State Electricity Commission of Victoria (SECV) became the first Australian utility to take a serious look at implementing demand-side management. In January 1990, the SECV released the final part of its Demand Management Report which concluded that energy efficiency would cost too much and that it couldn’t save enough to make demand management worthwhile.

However, David White, Victoria’s Minister for Manufacturing and Industry Development, was aware of the quite different conclusions reached by the National Institute of Economic and Industry Research (NEIR) in its detailed study of the potential for more efficient energy use and renewable energy to displace fossil fuel use in Victoria. The NEIR report concluded that Victoria could expand energy efficiency industries and save $4.74 billion in energy costs, while creating up to 17,300 additional jobs and reduce carbon dioxide emissions by 20%. White also knew that the SECV’s conclusions ran counter to the experience of utilities overseas.

He asked Amory Lovins, a consultant to the power industry at the Rocky Mountain Institute, a non-profit resource policy centre in Colorado, to check the SECV’s report. Lovins critiqued the project’s “excessively” conservative assumptions and recommended that, rather than its current 0.33%, the SECV should spend $50 million or 2% of their budget on demand-side measures.

Lovins’ report set off a lively debate. The SECV claimed that because Australia doesn’t have an existing local manufacturing base for energy efficient products, and imported versions are expensive, we can’t afford efficient energy measures. However, a more obvious conclusion to reach is that we’ve the potential here to create an industry for energy efficient products. At the same time we could create employment, improve the balance of payments and counter the high costs of imports. We can apply similar reasoning to the expertise necessary for energy audits, or the research and development of innovative technology for this expanding field.

Amory Lovins gave David White some obvious examples of the cost savings to be made from producing energy-efficient products. One of his examples was a compact-fluorescent-globe factory which “costs about 1% as much as building power stations to produce as much electricity as the globes will save. A $10 million superwindow-coating machine saves as much oil and gas as a $400 million off-shore platform extracts (but that kind of oil runs out and pollutes, while the first kind doesn’t).” And he concluded that the economic case for the energy-efficient products industries was impeccable: “Whenever we choose the wrong option, we starve the rest of the economy for capital, and hence reduce total employment.”

Meanwhile, the Conservation Council of Victoria argued that the SECV in its review had conveniently ignored the power industry’s links with energy-intensive industries like aluminium, which play a big part in pricing electricity and boosting demand. Australian electricity authorities have been fond of negotiating cheap power deals for aluminium smelters which lead to an increase in demand and perpetuate a vicious, ‘build more’ planning circle.

And Lovins, too, was disturbed by the predilection for energy-intensive ‘megaprojects’ like aluminium smelters which so often dominates strategies for generating investment and employment in Australia. He maintained that money invested in saving energy will yield vastly more benefits—in employment, environmental and economic terms—than the same money invested in smelter expansion or other energy-intensive industry. And money invested in mineral processing can’t be used to make the rest of the economy efficient and environmentally sound. This basic message—that demand side measures create wealth and employment—has so far fallen on deaf ears as far as management and, to a somewhat lesser extent the unions, are concerned.

And yet, despite all this, Lovins described the SECV as “the most dedicated and advanced proponents and practitioners of energy efficiency among their counterparts in Australia today.” Which is hardly good news for the rest of them. As Lovins found, an energy efficient economy isn’t a matter of overcoming technical barriers, but of removing institutional and bureaucratic obstacles. The obvious conclusion is that these obstacles are still a formidable impediment to a saner energy policy for Australia.

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