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# ENERGY DEMAND IN BUILDINGS

Australia is currently engaging in a community-wide debate about our future power needs, especially in regard to nuclear power. It is helpful to understand that energy is all about supply and demand; the more we demand, the more we must supply. This article examines ways of reducing the demand side, so we can more easily meet the supply side for a sustainable future.

Growth in major power infrastructure is often justified by predictions of big increases in energy demand. In the case of nuclear power, this is also said to be coupled with a supposed reduction in greenhouse emissions. The reality is not that simple, and nuclear energy does not have the answers we need to be sustainable. The first step is to reduce energy demand by up to 80% without abandoning a comfortable lifestyle - and we can do that right now.

We currently produce way too much greenhouse gas, which must be reduced by up to

70% by 2050 to avoid runaway global warming. Buildings account for about 40% of that problem, and therefore can also be 40% of the solution. Reduction in demand, twinned with a steady increase in power generation from non-greenhouse renewable energy sources, offers the needed solution. Both these strategies are immediately available, using existing technologies. What is missing is the political will to make them happen. A third long term solution lies in emerging technologies, which will take us into the next century, but we cannot wait for these to save us now – and we do not need to.

The first step in reducing greenhouse emissions, and establishing the principle that nuclear power is unnecessary anywhere, is to reduce the amount of energy required to achieve a given result. For instance, an incandescent light globe uses 5% of its energy to actually make light, the rest is wasted heat. The same amount of light can be made by a fluorescent bulb so that

only 5% is wasted as heat. This is a picture of basic efficiency, and whole buildings can be designed as efficiently.

For every building to reflect such good design principles, we need change to occur in every part of the marketing, design and construction process. The end user must be educated to understand that a well designed building is not only better environmentally, it is also a lot nicer to live in, and costs less to run. Any extra capital cost is reflected in the capital growth of the building. Some big players in the building industry have fought against higher building standards on the false argument of affordability, yet actual experience shows that an educated market wants it, and will pay for it.

The design and construction industry still needs a lot of training and motivation to break out of the 'same old, same old' mentality. Training courses, compulsory professional

development programs, and accreditation of all designers are part of this strategy. Applying minimum standards of resource performance - energy, water, or materials consumption - must also be applied.

NSW has BASIX, where minimum performance requirements are applied before planning approval is granted, but it does not achieve all it should since being hobbled by large building industry lobbyists.



[BASIX fact sheets regularly available, for more information see: www.basix.nsw.gov.au](http://www.basix.nsw.gov.au)

Other states use the Building Code of Australia, but this only controls thermal comfort. There is no regulation of commercial building performance. Thus Australian buildings are generally well short of the mark.

A carbon tax would create economic drivers to motivate developers to demand better buildings of their designers and builders, and to then market the benefits to consumers or tenants. Other tax breaks for improved performance have been discussed, but are more cumbersome, and probably less effective. Steeper water usage rates will have a similar effect on encouraging water efficient buildings.

All of these change agents must be applied together – pushing too hard at any one point will simply tear the fabric of the industry, and slow down effective change. With these forces at work more or less in unison, we will soon see all new houses needing no artificial heating or cooling (easy, and done every day by dozens of designers and builders), make all or most of their own energy, and use a tiny fraction of current water demand. All this, while their occupants enjoy natural comfort, healthier lifestyles, reduced running costs, and enjoy the feeling of being responsible for their own resources. This enables the whole community to move away from centralised major greenhouse-intensive energy infrastructure, to a decentralized mix of energy sources. It also encourages demand for small and medium localised renewable energy technologies, giving our brightest emerging industry an opportunity to become a global leader.

**Table 2.1 Australian energy supply, trade and consumption, by fuel in energy units (petajoules), actual 2003–04**

Energy product	Production 2003–04	Consumption 2003–04	Net exports 2003–04
Black coal <sup>1</sup>	7,615	1,558	6,208 <sup>5</sup>
Brown coal <sup>2</sup>	659	696	0
Renewable <sup>3</sup>	265	265	0
Petroleum <sup>4</sup>	1,154	1,789	–394
Natural gas	1,468	1,038	431
<b>Total</b>	<b>11,160</b>	<b>5,346</b>	<b>6,245</b>

Notes

<sup>1</sup> Includes coke and coal by-products.

<sup>2</sup> Includes brown coal briquettes.

<sup>3</sup> Includes wood, wood waste, bagasse, hydro-electricity and solar.

<sup>4</sup> Includes crude oil, condensate and LPG. Consumption refers to petroleum products. Exports include refined petroleum products.

<sup>5</sup> Consumption amount may vary from Production – Exports + Imports because of stock change and statistical discrepancies.

Source: Donaldson K *Australian Energy Statistics 2005*, ABARE, Canberra.

Table 2.1 above is an extract from Chapter 2 of the National Circumstance document, published by the Australian Greenhouse Office, which highlights the volumes of energy resources (except uranium), harvested in Australia annually.

What is missing is the political will to get the necessary framework in place. It is missing at state and federal government levels, and time is running out. But it must be noted that on top of its myriad safety problems, nuclear does not offer a greenhouse-free solution in the necessary time.

**“Political will is missing” says  
BDA NSW Environment  
Director Mr Dick Clarke**

**This is the first article of two, and leads on to WHERE WE CAN GET OUR ENERGY, which discusses the energy solution; where we can get clean power in time to do the work.**