

# NOTES FOR SENATE STANDING COMMITTEE ON FINANCE AND PUBLIC ADMINISTRATION PRESENTATION

## INQUIRY INTO GOVERNMENT STIMULUS PACKAGE

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This paper expands upon my presentation to the Inquiry.

### *My credentials*

I have worked on energy efficiency for over 30 years. I have played key roles in development and implementation of many energy efficiency policies and programs across all sectors, including appliance energy labelling, building energy codes, building greenhouse rating schemes, home and business auditing and assessment schemes, industrial energy efficiency programs, and so on.

### *Implications of Policy Options*

In its efforts to maintain the level of economic activity and employment, the Government faces a choice between:

- encouraging consumption for its own sake (eg through untied short term additional payments)
- encouraging consumption that actually adds to future environmental and financial problems (eg where the items purchased increase energy consumption, or infrastructure built supports greater energy use, such as expansion of roads or construction of inefficient buildings)
- encouraging ongoing consumption (eg through reducing income tax), or
- investing in measures such as energy efficiency (and some forms of infrastructure such as public transport) that create employment and economic activity now, and also deliver ongoing economic, social and environmental returns.

Lets compare two purchasing options.

If a million Australians buy a large plasma TV, each year they will generate around 500,000 tonnes more greenhouse gas and increase their energy bills by around \$100 million – for the lives of those TVs. (This assumes they use around 200 watts more than the TVs they replace, a reasonable value based on test results from Choice magazine.)

In contrast, if the same number of people replaced their old fridges with high star rating new ones, they would reduce emissions and energy bills by about the same amount. Both options stimulate the economy now. But one is equivalent to an ongoing tax cut while the other adds to future living costs and makes achieving greenhouse emission targets tougher, while adding more pressure to our overloaded electricity supply system – the additional power demand from the plasma TV scenario would require additional electricity supply capacity of around 200 MW (instead of freeing up 200 MW of existing capacity), costing around \$500 million of capital that could be used more productively elsewhere in the economy.

**We are making important choices at the moment. We must make the right ones. It is critical that short term stimulus does not undermine long term gain and, if possible, actively enhances long term outcomes.**

### *Energy Efficiency as Stimulus*

Investment in energy efficiency very much fits the last category outlined above. It is good value compared with other investments. We should be shifting at least some of the funds from the lump sum bonuses now proposed, to more targeted investments that help build our future, such as energy efficiency:

Energy efficiency investment grows the economy and expands the services and light manufacturing sectors, which are much more employment intensive than conventional energy supply. Even investing in imported energy efficient equipment builds local wholesale, transport, retail, trades and building activity, while supporting demand for Australian raw materials exported to Asia. For whitegoods, I believe (though I stand to be corrected) that only around 30% of the retail price is for manufacture, with the remainder feeding into the rest of the supply chain within Australia. And money saved on energy bills feeds into the broader economy (more on this later). A 2004 study by Allen Consulting for the National Framework on Energy Efficiency suggested that an energy efficiency program that reduced Australian energy consumption by an additional 1% pa would, over 12 years, involve additional investment of approximately \$2 billion, deliver net GDP benefit of \$12.4 billion and create 1,900 net additional jobs. The Australian insulation industry estimates that the proposed \$3.9 billion stimulus would create at least 4,000 additional jobs, which is consistent with the Allen study.

So it seems that each billion dollars invested in energy efficiency measures will create around 1,000 net additional jobs, as well as delivering multi-billion dollar GDP growth and freeing up existing stressed energy supply capacity.

Energy efficiency offers multiple benefits. Energy efficiency investment:

- it helps with climate change abatement
- it reduces ongoing energy bills and often cuts lifetime costs because it is in many cases cost-effective
- if properly targeted, it avoids or defers capital investment in energy supply infrastructure
- if properly targeted, it reduces risk of blackouts by reducing peak demand under extremes of weather
- it can enhance business productivity and product quality (Energy Efficiency Best Practice, Energy Efficiency Opportunities offer many examples)
- it can improve quality of life – comfort, health: for example a New Zealand study has shown that people living in insulated homes are healthier

The commitment in the proposed package to home insulation is a good example of how economic stimulation can capture the benefits of energy efficiency. The remaining Australian homes that are not insulated tend to be the ones that are hard to capture – a simple and attractive offer is necessary to overcome the barriers due to:

- landlord-tenant split incentives
- elderly people who are used to discomfort
- low income households (often with young children)
- climates that are generally mild, but have serious peak electricity demand problems in summer and winter, where the bulk of the financial benefit comes through avoided investment in energy supply infrastructure rather than large reductions in consumer energy usage.

Avoiding growth in peak demand reduces future greenhouse gas emissions because investment in additional generation, transmission and distribution capacity leads to pressures to increase its utilisation, and hence future growth in emissions

Insulation of these homes will deliver most of the benefits I outlined before – extending over the lives of the buildings. It will also help a struggling building industry to keep and add staff – industry estimates at least 4000 extra jobs.

Claims made by some that the ‘embodied greenhouse gas emissions’ in insulation will negate its benefit are incorrect. A life cycle analysis study carried out by RMIT University for the Commonwealth Environment Department in 2006 estimated that the average emissions from installed insulation were 7 kilograms of CO<sub>2</sub> per square metre – 1-2 tonnes for a typical house. This would be offset by energy savings in 1-3 years. Further, the study uses historical data: the insulation industry is more efficient and uses more recycled inputs now. And the stimulus package will capture substantial economies of scale by increasing utilisation of existing capacity. So the actual greenhouse ‘cost’ of insulation resulting from the stimulus package is likely to be significantly lower than that estimated in the RMIT study.

#### *Some other options for targeting the stimulus package*

Many more opportunities could be lost by poor targeting of financial stimulus. I argue that a much higher proportion of the package should go into energy efficiency, not simply be handed to people to indiscriminately increase consumption. But we need simple mechanisms to do this for households and small business so that rapid investment can occur to help with short term economic problems while supporting longer term success.

A range of mechanisms could be used in the stimulus package to drive investment in energy efficiency across the economy, including:

- Vouchers (or a debit card loaded with the appropriate funds to which a household is entitled, that can only be used to purchase specified items from approved suppliers) that can be used by households or small business to offset some or all of the cost of a range of items and services that we can be confident will save energy and help build a low carbon economy while creating more jobs.
- Competitive bidding of industry projects for funding, based on a business case
- Partnerships and subsidies to manufacturers, importers and/or retailers to reduce the retail prices of specific high efficiency products (such as efficient halogen IRC lamps – see below)
- Including requirements for features within building and project specifications, and purchasing specifications for government projects and purchasing activities

These could be applied as follows.

#### *Households*

Offering a range of energy efficiency options to households through some kind of voucher system instead of part or all of the proposed untied or loosely tied stimulus would ensure both short and long term benefits, but would also provide choice to satisfy varying needs. It would also spread demand across a variety of products and services, so that there was less risk of hitting capacity constraints. A short list of options for home improvement (beyond the present proposed insulation and solar HW measures, to which these would be additional) could include:

- draughtproofing products and services
- shading and window film products and installation – heat entering through windows and unshaded uninsulated walls is a major driver of summer air conditioning demand
- retrofit wall insulation – ACT already has a scheme that could be a model
- high efficiency lighting upgrades: existing programs have focused on Compact Fluorescent Lamps that replace standard 240 volt incandescent lamps. Halogen lamps are major contributors to energy waste, and a range of efficiency improvement options exists, from replacement by an improved drop-in replacement halogen (IRC type) that saves 30% (which could be subsidised through supermarkets and lighting retailers) to LED and CFL lamps that save 80% but require an electrician or have different light quality.
- replacement advanced glazing systems
- replacement of pre-1996 refrigerators by high efficiency units (If New Zealand data applies in Australia, we may well have around 1.5 million old, faulty fridges in Australian homes, wasting around \$150 million and needlessly generating around a million tonnes of greenhouse gas each year. Each household that replaces an old fridge would save \$50-\$200 each year.)

Other options could be added if they met specified criteria.

Where a household already has both ceiling insulation and solar HW, they should receive the equivalent of that package as an additional stimulus, to reward them for their early action. Since only about 6% of Australian households have solar HW, and only some of them would not have insulation, this proposal would provide fairness for a relatively small target group of early movers.

To improve cost-effectiveness and limit demand within supply capacity, these incentives could be targeted by climate zone, or where energy supply is most constrained. These options can also be focused on priority households (eg low income, mortgage stressed, living in areas where energy supply capacity is under stress, etc) first.

Additional measures that have merit include:

- Support purchase of a range of new, energy efficient appliances and equipment while retiring old, inefficient appliances – such as fridges, top loading washing machines, old air conditioners – charities could play a role (eg Brotherhood of St Laurence operates the Phoenix Fridge program in Victoria, which could be expanded).
- Adjust the First Home Buyers scheme after June to focus funding on high energy efficiency/solar buildings of modest to moderate size (and preferably located near high standard public transport services). More than half of Australian households are now 1-2 people, and public investment should be focused on building more housing of appropriate size, rather than subsidising indiscriminate construction of large houses on urban fringes. This will contribute to long term housing affordability and, I suspect, create more jobs, as there are substantial fixed costs (and hence employment) in any house, regardless of its size.

### *Business*

The proposed stimulus package offers little to industry to improve its competitiveness. Many businesses have been conducting energy efficiency assessments in response to government programs such as Energy Efficiency Opportunities. Some of the opportunities they have documented are cost-effective and worthwhile, but do not meet business rate of return criteria (especially when capital is scarce). Firms could be invited to bid for funds from a pool – possibly

with a requirement for repayment of the capital over time from savings. It should be possible to implement these measures quickly, because the analysis has already been done.

Other worthwhile measures for business include:

- Specific energy efficiency measures that are already well understood and available, such as efficient car park lighting packages, and specific products such as high efficiency 'Exit' signs could be subsidised and rolled out quickly
- Installation of smart measurement and metering and demand control systems in business and industry could be subsidised – it is often difficult to make a business case for measurement systems, but they are needed to identify savings opportunities and make a solid business case to management. Further, the improved feedback typically saves at least 5% on energy use through improved operation – you can't manage what you don't measure!
- Subsidies could be provided for purchase of diagnostic equipment for industry to identify energy waste, such as ultrasonic detectors, thermographic cameras, etc. This equipment can dramatically reduce energy waste and improve plant performance.

### *Government*

Where government agencies commission construction, materials specified should have low embodied energy/emissions, and the buildings and all energy consuming equipment installed should meet energy efficiency performance standards. Procurement of appliances and equipment should also specify high standards of energy performance.

The proposed public housing should meet 7 star building thermal performance standards. While this is more stringent than the 6-star level proposed for 2010, households in this housing are likely to have high occupancy (both in numbers of people and time spent at home), so a higher standard would be more cost-effective and provide more highly valued comfort. Further, modelling studies indicate that a house that meets this standard could be kept comfortable in extreme summer periods with limited artificial cooling – indeed, 1-1.5 kW of solar PV cells and a high efficiency air conditioner could provide adequate cooling without adding pressure to peak electricity demand. Lighting installed capacity should have high efficiency and should not exceed 4 watts per square metre. Where appliances are installed, they must achieve best practice efficiency.

New schools must provide comfort under extreme conditions. The Green Building Council and several state agencies have been developing guidelines for school building performance. The best of these should be applied to all approved projects. Where IT equipment and other appliances are installed, they should also meet best practice efficiency standards.

### *The Often Overstated Rebound Effect*

This much-discussed effect has been used by many Australian 'energy efficiency sceptic' policy makers as an excuse not to invest in energy efficiency. What is it? Basically if someone saves money by investing in a cost-effective energy efficiency measure, it is argued that they will spend that saved money on other things that consume energy, thereby driving energy demand back up. Also, if energy is effectively cheaper when delivering a service, they may seek a higher standard of service – and use more energy. Superficially these outcomes seem logical. But the effects are often overstated.

If your only focus is economic stimulus, the size of the rebound effect doesn't matter – the money freed up by saving energy will flow through the economy regardless of the exact nature of the rebound or flow-on effects. However, if you aim to achieve ongoing financial and environmental benefits, it must be considered.

The latest international study (a forthcoming paper in *Energy Policy* journal by Sorrell et al) comments:

“...bias that may lead the effect to be overestimated. For household energy services in the OECD, the paper concludes that the direct rebound effect should generally be less than 30%.”

But the issue is bigger than that.

The term 'rebound effect' itself reflects a cultural bias against energy efficiency. It's really a 'flow-on effect' which can increase *or* decrease energy consumption. For example if a person saves energy and money, the right policy settings could lead them to invest the savings in *more* energy efficiency. In this case, there would be an 'amplification effect' increasing the total energy efficiency improvement, not a rebound. Past experience of rebound effects reflects the historical situation where lack of efficient options, lack of promotion and information, and high prices of early products meant that savings were likely to be spent on energy consuming products or activities. We can change this.

Sceptics may also argue that estimates of energy savings are overstated for other reasons. This can sometimes be true, as we have failed to invest many resources into quantifying and documenting energy savings in Australia. But, in the context of the stimulus package, things are relative. Some ongoing benefit is better than none – and far better than increased future costs and impacts driven by the poorly targeted spending of the present stimulus package! So we don't have to go through an exhaustive process to identify energy efficiency actions that offer better value for society than just giving people money, as the bar has been set very low. Indeed, if we actually monitor the outcomes of energy efficiency measures driven by the stimulus package, we will learn important lessons that allow us to do better in the future.