

**THE JOINT STANDING
COMMITTEE ON
TREATIES**

**INQUIRY
INTO
THE “KYOTO
AGREEMENT” ON
GREENHOUSE GAS
EMISSION TARGETS**

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Executive Summary

There is no longer any serious disagreement in the atmospheric science community with the view that greenhouse gas emissions are changing the global climate and demand attention. Under the Framework Convention on Climate Change, the developed world as a whole is obliged to reduce emissions to 95 per cent of the 1990 level. Australia has a responsibility to limit its emissions for the 2008-2012 period to 108 per cent of the 1990 figure. The Australian government obtained this uniquely generous target at Kyoto, despite the fact that we have the highest emission levels per capita of any country in the world, by threatening to sabotage the convention unless we were given special treatment. We justified our obdurate stance by claiming that we were holding out for a realistic target. We would look quite foolish if we now failed to ratify a treaty which gives us uniquely generous treatment. Since Kyoto, there has been a strengthening of the scientific evidence that human activity is changing the global climate. The case for concerted global action has become stronger. So it is our duty as good global citizens to ratify the treaty which seeks to address the most urgent environmental problem facing the world.

Despite frequent claims by sectional interests, there is no convincing evidence that we would suffer economically from endeavouring to meet the Kyoto target. The task has been made more difficult than it should have been by a decade of inaction since the 1991 release of the report of the ESD process Energy Use Working Group and the 1992 National Greenhouse Response Strategy. The National Greenhouse Advisory Panel recommended in 1998 a renewed commitment to the NGRS; instead, the government disbanded the NGAP. The National Greenhouse Strategy contains laudable sentiments, but little in the way of practical measures. The only national policies that advance the Kyoto aim are the modest 2 per cent target for renewable electricity and the range of measures imposed on the government by the Senate during negotiation of the GST package. However, the A.C.T. and such cities as Brisbane, Adelaide and Melbourne have now set local targets to limit greenhouse gas emissions. Studies overseas conclude that most sensible reduction measures produce new jobs, for the fundamental reason that they replace energy-intensive activity with labour-intensive processes. So we should be developing a national greenhouse gas reduction strategy to allow us to meet the Kyoto target. Some measures require government spending, but others simply need changes in the signals governments send to the community, while others reduce expenditure that now encourages wasteful emissions. The longer we delay action, the less likely we are to achieve our goal.

1. Greenhouse gas emissions

Australia has a higher rate of greenhouse gas emissions per capita than any other country, with the current level about 20 tonnes of carbon dioxide per head [AGO, 1999a]. Our total emissions are already above our target for 2008-2012 and still rising. In the Kyoto negotiations under the Framework Convention on Climate Change, Australia was given a more generous target than any other developed nation. The USA, Canada, Japan and the European Union as a whole are expected to reduce their emissions below the 1990 level by 2012. Norway, Iceland and New Zealand were given more generous targets because these three countries already get more than 85 per cent of their electricity from renewable sources – principally hydro and geothermal, with a significant contribution from wind power in the case of Norway. Australia is alone among the countries heavily reliant on coal in having been given a target that allows increasing emissions by up to 8 per cent above the 1990 level. Further, in what is known around the world as “the Australian clause”, the Kyoto meeting agreed to allow land use change to be counted, so any reduction in the rate of land clearing will contribute to Australia being regarded as having lowered its emissions. Most observers see the Australian target as being especially generous in the light of our historical performance. While the developed world has reduced its carbon emissions per unit of economic output by about 25 per cent since 1970, largely through the efficiency improvements spurred by the oil crises of the 1970s, Australia’s performance has only improved about 4 per cent (Figure 1). That means that Australia can make relatively easy improvements in its emissions profile simply by embracing the technological gains that are now accepted in the northern hemisphere OECD nations.

Some have argued that we need not take steps to meet the Kyoto target because the treaty is not yet ratified, presumably believing that the process might yet collapse as a result of the obstructive attitudes of some national governments. That is indeed possible, but the more likely future scenario would involve more demanding targets. The Kyoto agreement allows effective stabilisation of emissions from the developed world at present levels. But the carbon dioxide emissions today are about 2.5 times the level that can be absorbed by natural systems. So achieving the declared goal of the international community, stabilising the atmosphere at levels that would prevent dangerous anthropogenic interference to the climate, will require much larger reductions than specified by the Kyoto protocol. More importantly, a truly global agreement must include developing countries, which are very unlikely to accept any agreement that freezes their material living standards as far below OECD countries as they now are. One possible scenario is a re-enactment of the process for limiting ozone-depleting chemicals; the Montreal protocol of 1987 was a first step, but was recognised as inadequate and subsequently tightened at the Stockholm and London meetings. As Senator Hill recently told the Australian business community, any re-negotiation of the climate change convention would be unlikely to give Australia the uniquely generous treatment it received in Kyoto.

2. Dimensions of emissions growth

A clear driving force is population growth. The national figures show that emissions per head increased by only 2.2 per cent between 1990 and 1997, whereas overall emissions grew by 11 per cent. Data for electricity use in south-east Queensland [Figure 2] show clearly that population growth is an important factor, but emissions growth there is dominated by lifestyle choices and inefficient technology that are together increasing per capita energy use.

3. Achieving savings

There are three ways to reduce emissions. We can reduce energy use, improve the efficiency of converting energy into the services people want, and use less carbon-intensive sources of energy. There is relatively little scope for using less energy because fuel energy provides the quality of life that most people now take for granted. One way of looking at the awesome amount of energy we use in Australia, equivalent to about 6 kilowatts of continuous use per person, is that it is roughly equivalent to having the services of fifty human slaves working round the clock in shifts. Energy does what human slaves used to do for feudal despots. It carries us about, it washes our clothes and cooks our food, it warms us when we are cold and fans us when we are hot, it entertains us, it removes our wastes and so on. It is now difficult to imagine how a modern society would function without large amounts of energy. Certainly the building in which this hearing is conducted would be uninhabitable! We will probably move in future to eliminate absurdly wasteful uses of energy, such as lifts to go down one floor, but our society is likely to remain energy-intensive for the foreseeable future.

Much can be done to improve the efficiency of turning energy into the services people want: hot showers and cold drinks, comfort and mobility. Australia has finally introduced minimum energy performance standards for some domestic appliances, such as refrigerators and electric hot water systems. While these standards are a long way from international best practice, they will still produce a significant improvement in the overall energy efficiency in this region. We can assume that almost all appliances in use by 2012 will meet the new minimum standards. This will significantly reduce emissions from such appliances as refrigerators, as well as electric hot water systems if such wasteful technology continues in use. Australia recently hosted an OECD conference on Eco-Efficiency at which a wide range of case studies showed that reducing resource use to a quarter of the present level is possible using technology which is cost-effective today. Only the most naïve economists doubt the scale of savings which can be achieved at a profit. We should be moving to toughen up the minimum standards to reflect world's best practice. At the moment, our standards even look lax by comparison with the USA, which is itself very wasteful of energy. We should also be extending the minimum standards to a wider range of domestic appliances and including basic industrial equipment.

Data recently collected on the fuel-efficiency of transport alternatives show that cars take twice as much energy per passenger-kilometre as the average for buses, four times the energy of tram or light rail systems, seven times the energy of electric trains and fifty times the energy of bicycles. That suggests that the order of preference for urban transport should be the exact opposite of that advanced by recent public policy. We regard bicycles as only for young people until they graduate to something more dangerous, we have allowed tram and train systems to become steadily less attractive, and have made only token investments in buses while squandering huge sums on infrastructure to encourage use of cars and freight trucks.

4. Cleaner energy sources

The Australian government has set one concrete target in response to global warming. It has required electricity retailers to obtain an extra 2 per cent of their supply from renewable sources by 2010. That means we can expect 2 per cent of the total coal-fired electricity used in 2010 to be replaced by renewable energy technologies. This is a very timid response.

The principle is correct; we should obviously be moving to energy forms that emit less carbon per unit of delivered energy. In round figures, oil emits about 80 per cent the carbon per unit energy of coal, gas about 60 per cent, coal-fired electricity about 300 per cent and renewables about 10 per cent. So replacing coal-fired electricity with almost any other energy supply makes sense in terms of reducing emissions. Cooking with gas rather than coal-fired electricity emits a small fraction of the carbon dioxide to achieve the same task. Co-generation schemes, or Combined Heat and Power schemes as they are known in Europe, roughly halve the emissions per unit of useful energy, so we should be developing measures to encourage that technology, such as the schemes to use “waste” heat from sugar mills.

The biggest gains occur when coal-fired power is replaced by renewable forms such as solar, wind or biomass. Many households and some businesses have now adopted green power schemes, by which a premium is paid to have electricity entirely from renewable sources. This is a remarkably cost-effective way of achieving large reductions in emissions. I calculate that a typical Brisbane household using the local “Earth’schoice” scheme reduces their carbon emissions by about as much as giving up the family car, for a cost of about \$2.50 per week. Such schemes should obviously be promoted. The data from the green power schemes put the economics of achieving emission reductions in perspective. It adds about 20 per cent to the power bill to get all of my electricity from renewables. So getting the government’s target of 2 per cent will add about 0.4 per cent, or a few cents a week for a typical household. That is so small as to be undetectable. A more serious target, say 20 per cent extra renewable power, would only add 4 per cent if the present experience could be scaled up; a more realistic figure would be two to three times that, or about 10 per cent. This sort of increase is clearly considered politically acceptable, because it is the increase the government chose to apply to most goods and services from July 1 this year with its GST! Many overseas countries have invested heavily in new forms of renewable energy; for example, about a quarter of the installed capacity of the state of California is now made up of various forms of renewable electricity supply, and most European countries have more serious targets like getting an extra 10 per cent of their electricity from renewables by 2010.

4. Transport

As discussed above, the recent approach to transport has been totally dominated by road building. In recent decades, about \$1 billion of public funds has been spent on all forms of public transport while more than \$40 billion has been lavished on roads. Other approaches are possible. The 1995 Brisbane Travel Smart initiative aims to reduce the proportion of trips by car from 75 per cent to 60 per cent by 2011, increasing the public transport share from 8.5 per cent to 17 and increasing the proportion of trips by bicycle from 1.5 per cent to 8 per cent. These targets are achievable, as conceded by the Queensland government’s Integrated Regional Travel Plan. The IRTP says “a 100 per cent increase [in public transport use by 2011] within the city boundaries would be achievable with the right mix of policies and investment to improve public transport and discourage private vehicle use”. This should be seen in the context of the overall philosophy of the IRTP, which is that “tough measures to restrain the use of the private car” are not politically feasible at this time. On health grounds, we should be encouraging more people to cycle in our cities. Many European cities have between 20 and 40 per cent of all urban trips made by bicycle, despite a generally less favourable climate; it would be realistic for Australian cities to aim at a target of 10 per cent.

This raises the important issue of the link between infrastructure provision and the pattern of transport. The impact of such unplanned events as the closure for structural reasons of a London bridge showed that provision of infrastructure generates its own demand, while removal results in demand reduction. This conclusion applies to all forms of transport: cars, freight vehicles, bus and train travel, cycling and walking. In each case, the provision of better infrastructure generates increased demand, while the removal of existing infrastructure [or failure to provide desired extensions] constrains demand. So current thinking no longer sees travel demand as an independent variable for which supply must be provided, but a variable which is directly and measurably influenced by the available supply capacity. The provision of any increased capacity, whether it is in the form of extra buses or light rail vehicles or cycleways or road space for cars and trucks, is effectively a decision to stimulate increased use of that particular travel mode.

As an extension of that argument, the goal of the “low-transport city” is now foreseeable. National capital cities like Vienna and smaller cities like York have effectively banned cars from their CBD except for emergency vehicles and early morning deliveries, while other cities have sought to constrain car use by such strategies as road pricing, congestion charges or increased parking fees. Singapore has found that quite modest charges on vehicles entering the CBD at peak hours (of the order of \$2.50) have reduced vehicle numbers by 20 per cent. It is worth noting that changes to the Fringe Benefits Tax may influence the choice to use a car rather than public transport.

Since individuals naturally prefer to make their own decisions about transport, it has been argued that the best way to stimulate more responsible behaviour is through the provision of information about the alternatives and their consequences. Transport SA have operated a pilot scheme which has reduced vehicle-kilometres travelled by about 20 per cent in typical households, showing that relatively small investments in **information** infrastructure may produce very large savings in spending on **transport** infrastructure. Traditional thinking has made it more difficult to get small funds for information systems than to obtain much larger amounts for capital investment in the transport network; there is a clear case for a broader approach to thinking about infrastructure costs and benefits.

Emission reduction will be achieved by some recent transport initiatives such as the Brisbane busway system and light rail loop, the rail links to Sydney and Brisbane airports, and so on. But these are dwarfed by the massive investment around the country in new urban arterial roads and wider inter-urban roads. These might have been designed to encourage increase use of transport fuels and associated increased emissions. If we are serious about our Kyoto target, we have to tackle the issue of transport. We need to invest in the infrastructure that will allow transport of people and freight to be more efficient and less polluting.

5. Some other possible reductions

For historic reasons, the level of use of solar hot water in Australia is very low. It satisfies about 45 per cent of the Northern Territory demand and about 25 per cent in Perth, but only 7 per cent in the A.C.T. and, remarkably, even less in Queensland, the self-styled “sunshine State”. It was pardonable to use more primitive systems like electric heating when the solar technology was being developed, but that approach no longer makes sense. A survey conducted in 1983 found the pay-back time for solar hot water in Brisbane was typically about five years; that result inspired me to install solar hot water and keep detailed records,

confirming that the capital cost was recovered in a similar period. The pay-back time in most parts of mainland Australia is much less than the guarantee period for the most reliable new models. We should be mandating use of solar domestic hot water for new residences except where there are site-specific problems. Growth over the next ten years from the current 6 per cent of the market to 20 per cent would be a feasible target which could be achieved by a combination of the financial incentives now being provided by various levels of government and political encouragement. The Spanish Prime minister recently installed Australian solar cells on the roof of his residence in Madrid; when Greenpeace activists put similar devices on the roof of Kirribilli House, our Prime Minister had them removed.

A realistic target of a ten year time scale would be to reduce overall energy use in our existing commercial buildings by 10 per cent through encouragement of participation in State efficiency programmes and/or the Commonwealth Greenhouse Challenge scheme. A 1994 study by Sustainable Solutions estimated that the total energy demand for heating, cooling and ventilation of commercial buildings in Brisbane could be stabilised at the 1990 level or reduced to 10 per cent below that, despite subsequent and projected further growth in floor area, using measures that are cost-effective now. New buildings that are well designed, such as the construction at 120 Edward Street, can achieve much greater savings and incorporate other measures such as embedded generation of solar energy.

Finally, there are some measures that the government might well take to reduce its own emissions further. It could aim to improve the average efficiency of its vehicle fleet by 15 per cent over the next ten years; this would really just keep pace with the expected improvements in the efficiency of new vehicles in the national fleet over this time. A fleet of large government cars, each carrying one official or politician, sends a message to the community. A fleet of smaller and more efficient vehicles would send a different message, as would such radical policies as encouraging those going to the same destination to share a car.

6. Economic implications of Kyoto

It is sometimes claimed that meeting our obligations under the Kyoto treaty would impose serious economic costs on Australia. These claims are based on economic analysis that is so seriously deficient it has no real credibility. When I conducted a survey for the then Department of Arts, Sport, Environment, Tourism and Territories of several attempts to model the economic effects of meeting emission targets, I was shocked by the quality of most of the studies. They had the following fundamental deficiencies.

6.1 Neglecting the cost of inaction

No studies consider the cost of doing nothing, despite the obvious fact that the sort of climate change being predicted would impose heavy costs on the Australian economy. Studies published more than ten years ago showed that agriculture is likely to be seriously disrupted. Recent work on coral bleaching shows that the Great Barrier Reef tourist industry, now worth some \$1.6 billion annually, is likely to be seriously affected within twenty years. Sea level increase and storm surges pose a huge threat to low-lying property along the Queensland coast. It is quite likely that the cost to the Australian economy of climate change would be much larger than any possible cost of meeting our Kyoto target.

6.2 Neglecting positive effects

Meeting our target would involve changing the pattern of rewards, charges and non-monetary incentives which now influences investment decisions and consumer behaviour. These changes would stimulate some economic activities such as renewable energy technologies and efficiency improvements; those studies which considered the positive effects as well as the negative conclude that they are likely to be of similar magnitude. At least as importantly, responding seriously to our Kyoto commitment should lead to a broad shift from energy-intensive activities to those which are labour-intensive. Thus there are likely to be many more jobs created than would be lost. This is consistent with overseas experience.

6.3 Exaggerating negative effects

Most studies exaggerate negative effects by making the absurd assumption that we will only try to change energy-use behaviour by the price mechanism. This would be a very silly approach because we know that energy use, especially in the short term, is very insensitive to price. Since petrol use is only marginally affected by its price and domestic electricity users get no price signals at all except a quarterly bill, changing use by price alone would require very large increases which would have negative economic impacts. That is why the National Greenhouse Response Strategy called for an integrated approach which involves pricing, consumer education, regulatory measures and provision of alternatives. Calculating the impact on the assumption that we will only use the most ineffective measures borders on dishonesty. Some studies have gone even further down the road of sharp practice by looking only at particular industries which are heavily dependent on carbon fuels. It is no shaft of insight to say that the aluminium industry would be affected if its huge public subsidies were to be withdrawn, or that the coal industry would be affected by a carbon tax. An honest analysis would consider also the breadth of economic activities in modern Australia. Those studies which have done so conclude that the negative effects are likely to be of similar magnitude to the positive ones. So there is no credible case that the Australian economy as a whole would suffer, although there would be winners and losers – as there are from other policies such as reducing tariffs, selling public enterprises, introducing a national competition policy or imposing a GST.

7. Some specific recommendations

- a) Increase the 2 per cent renewables target to a more serious level;
- b) As recommended by the ESD Working Group on Energy Use, conduct a serious investigation of the possible use of a carbon tax;
- c) Provide low-interest finance to householders and companies for efficiency improvements;
- d) Bring appliance efficiency standards and building codes into line with the rest of the developed world;
- e) Develop structural measures that would encourage co-generation, such a targets similar to the specific goal for renewables;
- f) As recommended by the ESD Working Group, consider the effect of limiting the exemption of housing from capital gains tax to some maximum level;

- g) Implement the proposed “greenhouse trigger”, without which the government has limited legal power to prevent developments that would prevent our achieving our emissions target;
- h) Phase out, over a period of several years to prevent disruption and consequent political problems, the current huge subsidies of road freight vehicles, as such subsidies cannot be justified on grounds of greenhouse emissions, road safety or economic efficiency;
- i) Consider ways of providing price signals to motorists to reflect the real cost to the community of car use, such as replacing annual fixed costs [registration, compulsory third party insurance] by higher running costs [fuel taxes] and/or making registration charges a function of vehicle efficiency;
- j) Develop the sort of vehicle efficiency or fleet average efficiency standards which apply in many other countries;
- k) As a particular measure, reconsider the tax structures that are now encouraging the trend toward use of four-wheel-drive vehicles for urban travel;
- l) Cease [or, at least, slow down] the manic road-building programme in urban areas, diverting some of the resources saved to improving public transport and implementing the National Cycling Strategy.

8. Conclusion

The atmospheric science community has been warning for fifteen years that human actions are changing the global climate. This view now commands wider acceptance. For example the Business Environment Leadership Council, which includes such companies as BP, Shell, Du Pont, Toyota, Enron and Boeing, recently said “we accept the view of most scientists that enough is known about the science and environmental aspects of climate change for us to take actions to address its consequences”. The Business Council told the recent National Dialogue on Greenhouse “although there are uncertainties in the science of climate change, there is sufficient reason to be concerned that increasing levels of anthropogenic greenhouse gases lead to interference with the world’s climate system...it is important that Australia plays its part in a worldwide effort to reduce greenhouse gas emissions”. There is no compelling reason for Australia to stand aside from the global agreement to set targets for greenhouse gas emissions; indeed, we stand to lose much more from such a course of action than we would gain. We should ratify the Kyoto treaty without delay.

The World Commission on Environment and Development concluded twelve years ago that “a safe, environmentally sound and economically viable energy pathway that will sustain human progress into the distant future is clearly imperative. It is also possible. But it will require new dimensions of political will and institutional co-operation to achieve it.” That is still true today. We should not let it not be the epitaph for our generation that we lacked the political will and were unable to devise the institutional arrangements that would allow our grand-children to have the quality of life that we take for granted.

The national government is being shown a lead by other levels of government. Adelaide, Brisbane, Melbourne and the ACT now have serious greenhouse emission targets. Melbourne is aiming to have its 2010 emissions 20 per cent below the 1995 level, while the ACT aims to stabilise at the 1990 level. Adelaide has a two-stage goal: to stabilise emissions at the 1994 level by 2004 and reduce them 10 per cent by 2010; this amounts to a 7 per cent reduction by 2004 and a 23 per cent reduction by 2010 on the business-as-usual projections.

Queensland now has an energy policy which requires 15 per cent of power to come from gas or renewables by 2005, which commits the government to getting 5 per cent of its own electricity needs from green power schemes, and which provides increased support for solar hot water and efficiency improvements.

As a footnote, a recent European Union project pulling together eleven specific sectoral studies concluded that reducing emissions by 15 per cent by 2010 would generate about 2 million net jobs across Europe. This is because most of the changes provide extra jobs: public transport provides more jobs than private transport, efficiency improvements provide more jobs than energy production, cycleways and footpaths are more labour-intensive than roads. So a serious strategy to meet our greenhouse target would not just be an investment in our common future, but also an investment in the future social development of the country.

References

Australian Government (1991), Ecologically Sustainable Development Working Group on Energy Use, Final Report, AGPS

Australian Greenhouse Office (1999a), Overview: the 1997 National Greenhouse Gas Inventory, greenhouse notes, FACT SHEET 1

Australian Greenhouse Office (1999b), Australia's greenhouse gas emissions *Frequently Asked Questions*

I. Lowe (1989), *Living in the Greenhouse*, Scribe Books, Newham

I. Lowe (1992), *Costs and Benefits of Meeting Greenhouse Gas Emission Targets*, report to DASETT, Griffith University, Nathan

OECD (1998), *Eco-Efficiency*, OECD, Paris

Queensland Government (1996), *Integrated Regional Transport Plan for South East Queensland*

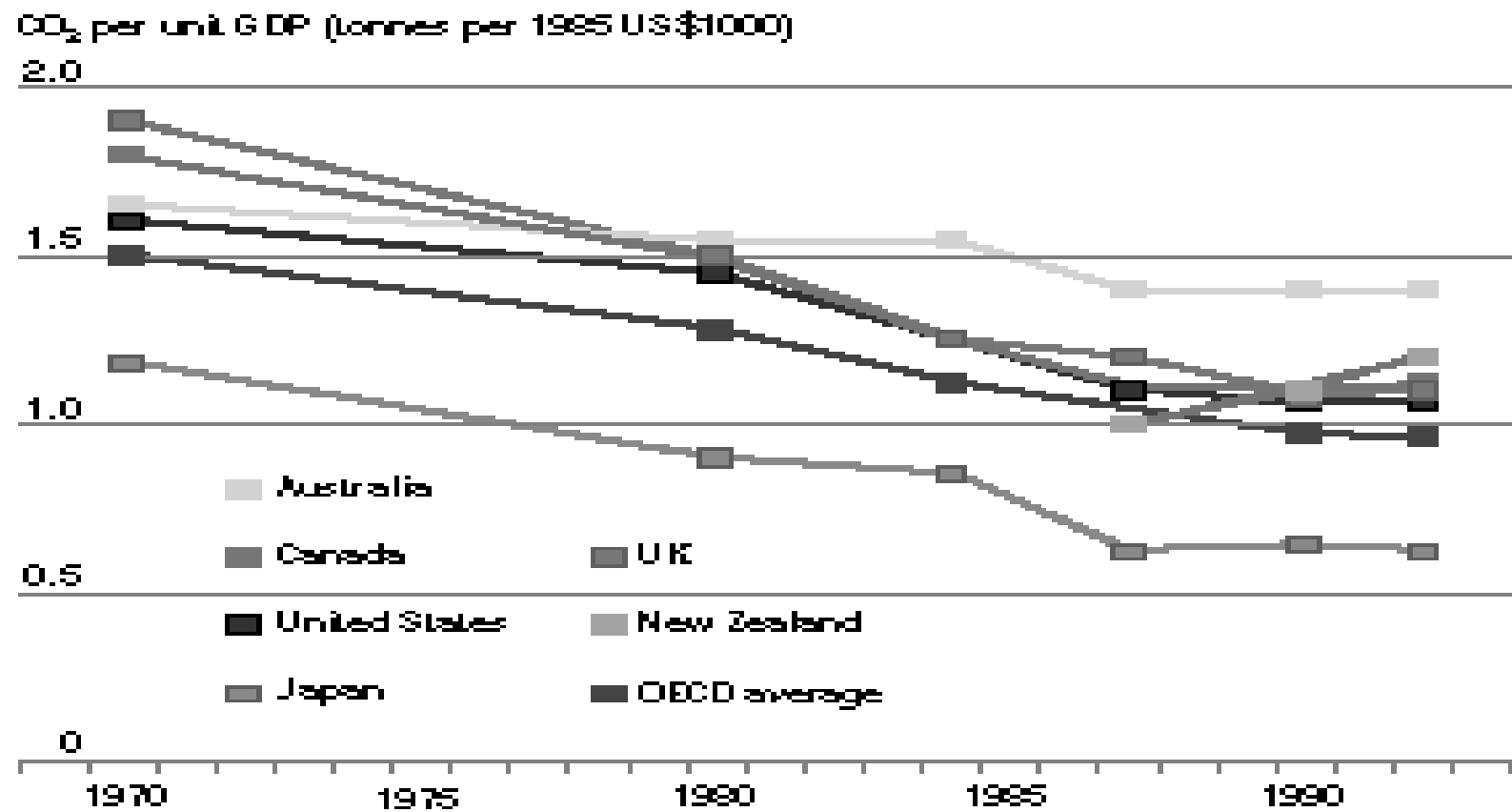
Queensland Government (2000), *Queensland Energy Policy*, Brisbane

State of the Environment Advisory Council (1996), *State of the Environment Australia 1996*, CSIRO Publishing, Collingwood

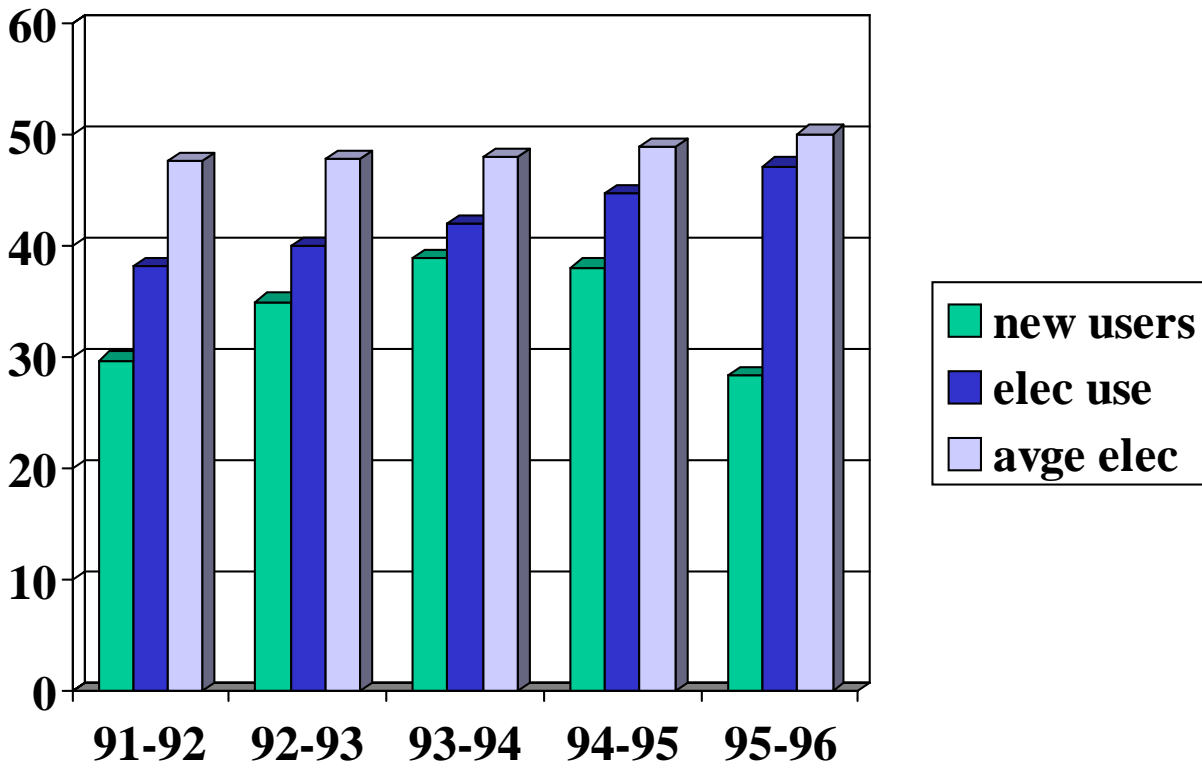
Sustainable Solutions (1993), *Keeping Commercial Buildings Comfortable*, in DEST, *Energy Use and Greenhouse Gas emissions Scenarios: Three Sectoral Studies*, AGPS, Canberra

Figure 1 [from State of the Environment Report 1996]

Figure 5.7 Energy-related carbon dioxide emissions per unit GDP for selected OECD countries, 1970-92



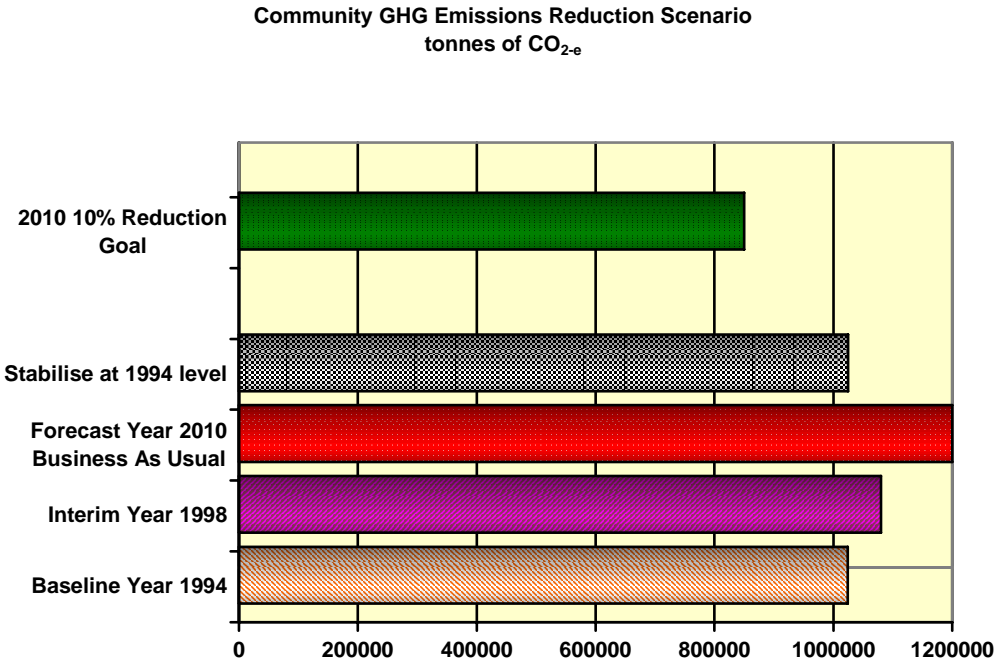
Source: derived from IEA (1994).



SEQEB data showing demand growth dominated by increasing use per customer

Figure 2: The changing pattern of electricity demand

Figure 3: The rationale of the Adelaide greenhouse gas reduction goal



Greenhouse gas emissions from City of Adelaide are expected to reach 1,200,000 tonnes under a business as usual scenario by 2010. The achievement of the community goals of 10% on 1994 baseline level (1,024,631) would decrease community greenhouse gas emissions less than 922,167 tonnes. This equals to 23% (277,833) reduction on business as usual basis. Stabilise emissions at 1994 level by 2004 equals to 7% (77,642) business as usual adjusted reduction.