THE AUSTRALIA INSTITUTE

Background Paper No. 12

From Kyoto to Hobart

Economic Renewal through Environmental Leadership in Tasmania

Clive Hamilton

March 1998

The Australia Institute
PO Box 72, Lyneham, ACT 2602, Australia
Tel: 61 6 249 6221 Fax: 61 6 249 6448
Email: austinst@ozemail.com.au

The author would like to acknowledge his debt to Andrew Blakers, Mark Diesendorf, Mark Ellis, Chris Harries, Alan Pears, Hugh Saddler and John Todd, all of whom have been generous with their time and expert advice. However, the views expressed in the paper are entirely those of the author. The paper has been commissioned by the Tasmanian Greens.

1. Outlook for Tasmania

The world was transformed at the climate change convention in Kyoto last December and this new world will have major implications for the energy economy and the economic future of Tasmania.

For too long, Tasmania's political leaders have been preoccupied with economic problems while ignoring the economic and environmental opportunities that their unique island offers. The current debate over the privatisation of the Hydro-Electric Corporation reflects the narrowness of this preoccupation. Largely confined to accounting questions, the debate has been dominated by estimates of sale proceeds and interest savings on state debt.

But there a bigger picture emerging, one in which we can envision the HEC, not as a historical relic to be sold off but as an essential part of Tasmania's future. Events transpiring in the rest of the world have sharply transformed the way in which the Hydro and other sources of renewable energy can contribute to Tasmania's future.

Hydro-electric power gives Tasmania a unique and increasingly valuable characteristic – an electricity system free of greenhouse gas emissions. Nor is it responsible for the other harmful emissions that spew from the smoke-stacks of coal-fired power plants.

2. Implications of the Kyoto Agreement

Last December, the major economic powers of the world agreed at Kyoto to embark on a program of cutting emissions of greenhouse gases because they are transforming the global climate in ways that could be catastrophic. While the industrial powers have agreed to reduce their emissions to around 7% below 1990 levels by the year 2012, climate scientists agree that emissions will need to be cut by more than 70% to stabilise climate change. Kyoto is therefore only the first step and will be followed by increasingly comprehensive and stringent international agreements.

In response to the Kyoto agreement, the world economy will undergo some fundamental changes over the next two decades. The newspaper headlines since Kyoto give a foretaste of what these changes will bring:

'America's major car makers are now planning to replace gas-guzzlers' (The Daily Telegraph London)

'Big players target growing solar industry in US' (Reuters New York)

'Kyoto heralds century of energy diversity: Experts' (Reuters London)

'Environmentalists praise industry for saving the world' (Sunday Telegraph London)

'Upstart company has patent to make fuel from trash' (Reuters New York)

'No let up against polluters' (New Straits Times Malaysia)

'Japan's electric and power firms to reduce gas emissions' (Nikkei Industrial Daily)

'Texaco, Shell chiefs also seek climate action – BP' (Reuters London)

'MITI to set guidelines for greenhouse gases' (Japan Times)

Billions of dollars will be invested in the search for low-emission and renewable energy sources and in energy-saving technologies. The world's biggest corporations know that the rewards will be enormous. Non-polluting energy sources and energy saving technologies will provide tremendous commercial opportunities.

These opportunities will arise not only in the industrialised countries but in developing countries too. The Kyoto Protocol established a 'Clean Development Mechanism' that will allow First World firms to profit from approved emissions reducing investments in developing countries. The Protocol also provides for the development of an international greenhouse gas emissions trading system that will in all probability see the emergence of a thriving market for certified emission savings.

Governments in Europe, North America and Japan will introduce a range of policies that will require all sectors of the economy to reduce their emissions. They will include emission caps, emission trading, mandatory energy efficiency standards, carbon taxes, subsidies to energy efficiency and funding for research and development of renewables. The commercial environment will be transformed by these measures. The basic economic impact of these policies will be to increase the prices of those energy sources responsible for high emissions relative to the prices of those that have low or zero emissions. Countries and regions that can develop renewable energy supplies will enjoy a substantial and increasing competitive edge for they will enjoy first mover advantage in the energy industries of the 21st century.

3. The Australian response to Kyoto

Australia is a signatory to the Kyoto Protocol, although meeting our generous target will be relatively easy, especially if the rate of land clearing continues to decline with or without Commonwealth intervention. However, some policy response is required if only to maintain our international credentials as a responsible global citizen. Moreover, as more stringent targets in the future are almost certain it would be foolish to allow ourselves to be left behind the rest of the world.

What policies are likely in Australia? The package of measures announced by Prime Minister Howard in November 1997, although weak, show some of the future directions. It included:

- extension of the program of voluntary agreements with major polluting industries to cut emissions;
- measures to encourage commercial vehicles to switch to natural gas;
- mandatory targets for inclusion of renewable energy in electricity generation;
- funding for the commercialisation of renewable energy technologies; and
- measures to increase rates of plantation establishment and revegetation.

Some of the more far-reaching policies Australia will need to adopt have been clearly flagged by the International Energy Agency in its 1997 review of the Australian energy economy. The IEA observes that there is 'great potential for improvements in energy efficiency' and recommends the following:

- higher taxes on fossil fuels;
- nationwide mandatory energy efficiency building codes;
- mandatory standards for electrical appliances;
- new targets for vehicle fuel efficiency; and
- improved interstate public transport.

The NSW Government has taken the lead in Australia and now requires electricity retailers to cap their emissions. Its Sustainable Energy Development Authority is implementing a number of innovative and highly effective energy efficiency programs that are not only reducing pollution but increasing profits for those firms involved. NSW is seriously considering the introduction of a world-first emissions trading system for greenhouse gases in the electricity industry.

These are the policy directions of the next decade that will define the commercial environment for the HEC and other energy suppliers in Tasmania.

4. Impacts and opportunities for Tasmania

The key implications of the post-Kyoto world for Tasmania are as follows.

- **Electricity from renewable sources such as hydro-electricity will become increasingly sought after.** Customers will be willing to pay higher prices since the prices of coal-based electricity will rise even more in response to carbon taxes and emission caps. Renewable sources will be increasingly sought by electricity users (including electricity retailers) with emission constraints.
- Throughout the world there will be a great expansion of renewable energy following large investments and technological breakthroughs. **The unit cost of producing renewables will continue to fall and will provide increasing competitive pressure for coal and nuclear fuelled power.**
- **A global market will develop for emission credits, and these credits will become a critical part of the asset portfolios of many of the world's biggest corporations.**
- Global consumers will attach increasingly high values to products of all sorts produced using environmentally friendly methods. **Regions that successfully promote themselves as environmentally benign with unpolluted atmosphere, waterways and landscapes will enjoy a growing commercial advantage for a**

range of high-value products.

More specifically, while electric power generated from *existing* hydro in Tasmania will not attract emission credits under the Kyoto Protocol, nor will it be subject to the carbon taxes or equivalent measures that will drive up the price of coal-based energy. For firms seeking low energy prices Tasmania will be a completely non-taxable environment. In other words, while carbon taxes or other forms of regulation will increase electricity prices from coal-fired facilities elsewhere in the world, including the Australian mainland, Tasmanian hydro power will be tax-free because it has no emissions.

On the other hand *new* forms of renewable or low-emission electric power will attract emission credits, even if the Australian Government lags the rest of the world in introducing the mechanisms to allow Australian firms to trade domestically.

Already a world-wide market for emission credits is emerging. A Canadian firm, Vision Quest Windelectric Inc. in Alberta, offers 'carbon offsets' for around A$35/tonne of CO2. This price is higher than offsets from sources such as plantations in Costa Rica but the higher value may well be justified by several factors, all of which apply equally to any expansion of wind power in Tasmania.

- They derive from wholly emissions-free energy production that is certifiable and auditable.

- The offsets are permanent (unlike forests that are logged or burnt) and based on naturally renewable sources.

- The technologies used create employment and regional economic diversity.

An equivalent tax at this level would see electricity prices to consumers in eastern Australia rise by around 30%. Compared to coal-based power, the price of Tasmanian hydro-electricity is likely to improve by this amount over the next decade and by substantially more in subsequent years, giving renewable energy from Tasmania an increasing price advantage.

In addition to the price effects of the new policy environment, technological advance is causing a continuing decline in the unit cost of renewables. Since the early 1990s, the price per kilowatt hour for electricity generated from wind, waste and landfill gas have all fallen by more than 50%. These prices will continue to fall.

In sum, Tasmania is in a strong position to participate in and benefit from one of the most exciting and important developments in global business, one now at the forefront of planning of some of the world's biggest corporations.

5. The role of the HEC and Basslink

Selling the HEC

A cargo cult mentality is developing in Tasmania around the proposed privatisation of the HEC. But a simple economic question has been overlooked. If there are net economic benefits to Tasmanians from selling all or part of the Hydro's assets, where do these benefits arise from? The only source of economic gain – rather than financial transfers from one part of the community to another – would be from economic efficiencies that can be implemented only in private hands, that is, changes to the operation of the Hydro that result in resource savings.

Privatisation is neither a necessary nor sufficient condition for improving the efficiency of public enterprises. Even the Industry Commission has concluded: 'A key factor determining the efficiency of an enterprise is how it is managed – not whether it is publicly or privately owned'. Indeed, a range of international studies indicates that where there is a natural monopoly or significant regulation is required, public ownership performs *better* than private ownership. These studies show that this applies particularly to the generation and distribution of electricity and to the supply of water. Experience in Britain indicates that transfer of a public monopoly to private hands can cause a decline in efficiency and quality of service.

In recent years, the Hydro has made large strides in improving the economic efficiency of its operations – employment has been cut by more than 40% over the last 5 years and electricity sold per (non-construction) employee has risen by 44%. The HEC is now operating close to best practice. **There is no magic pudding from privatisation; most of the productivity gains have already been achieved and those than remain can be achieved while it remains in public hands.**

Asset sales are essentially a political exercise. They generate immediate cash flows for the Government of the day but deprive future governments of a revenue source. **A proper accounting of the financial flows shows that for most asset sales, the public owners experience large losses over time.**

In addition, the proposed sale of the HEC needs to be placed in a broader context, that of the future of the energy economy in Tasmania in the post-Kyoto world. This requires that we ask about the long-term implications of energy supply and the future development of the State. A privatised HEC may well undermine these opportunities since the development needs of Tasmania would be incidental to the new owners.

Basslink

The decision over whether to link the Tasmanian system to the mainland grid is clearly a critical issue for the future of the HEC. **However, under current regulatory and pricing arrangements the construction of Basslink would be damaging to the Hydro and Tasmania's potential to develop into a growing source of green power – irrespective of whether the retailing and distribution systems are publicly or privately owned.** Victorian generators are selling coal-based electricity very cheaply, wholesaling at less than 2c/kWh, so that Tasmania

could easily become a net electricity importer resulting in substantial unused hydro capacity and strangling the growth of new sources of renewable energy. **Regulatory and market conditions on the mainland do not yet provide proper incentives and returns for green power.**

There are a number of dangers of Basslink under current conditions.

1. Once connected to the mainland grid, the HEC would be a relatively small energy supplier in a market dominated by large and aggressive players. In the face of fierce competition from Victorian utilities, the HEC could probably maintain market share only by price cutting – since the generation facilities in Tasmania are largely sunk costs. However, shaving profit margins could sharply reduce the capacity of the HEC to service its debt. **Thus remaining unconnected is at this stage essential to protecting the profitability of the HEC.**

2. Connection to the mainland grid under the wrong circumstances could mean that Tasmania would see its unique advantage in clean energy diluted as base-load power is transmitted from coal-fired power stations in Victoria. This would undermine to the strategy of differentiating Tasmania as a source of clean, green products. Diversity and uniqueness are becoming increasingly powerful forces in the globalised world. **The energy needs and the energy strategy of Tasmania would be endangered in the battle among the mainland giants, themselves increasingly dominated by foreign corporations.**

3. If Basslink were built now, the HEC would most likely become an exporter of electricity at peak periods and an importer of electricity in off-peak periods.[1] This would mean that in place of the relatively even flows through the dams, the rivers would experience very large flows for short periods. Floods of one in 100 years intensity would occur every day with devastating effects for downstream ecosystems. **Construction of Basslink under current circumstances would almost certainly precipitate another decade of bitter environmental disputes in Tasmania.**

In the longer term, construction of Basslink in the wrong circumstances may mean that Tasmanians through their Government would lose control of one of the most powerful instruments for influencing the employment and industrial future of their state. As a source of emission-free electricity, Tasmania has the potential to play a significant role in Australia's national efforts to reduce greenhouse and other atmospheric pollutants. In order to play that role Tasmania would need to be an expanding supplier of green power, that is, a net exporter rather than the dumping ground for cheap coal-based electricity from the mainland.

The situation could change markedly if the regulatory and price regimes on the mainland reflected the true costs of generating and distributing electricity. When comprehensive greenhouse abatement policies are developed and implemented on the mainland, Tasmania has the potential to make a significant contribution to meeting

[1] Some commentators argue that there is sufficient peak power in the grid already and the HEC would be sending bulk power across the Bass Strait. This would reduce the economic returns to Basslink but would alleviate the problem of flooding.

Australia's international greenhouse gas reduction obligations. This could be achieved either by exporting renewable electricity to the mainland or by attracting industry from overseas and benefiting from 'baseline shifting'. Until the regulatory and price changes occur, connection to the mainland grid would in all likelihood see the HEC end up as a pawn in the competitive game of mainland industry.

In summary, while Basslink may in the future provide the opportunity for Tasmania to develop into a significant source of emission-free electricity for Australia, to benefit Tasmania its construction must be conditional upon:

- **proper pricing and regulatory regimes on the mainland so that electricity generated from renewable sources faces a 'level playing field'; and**
- **investment in new sources of clean green electricity for 'export' to the mainland.**

6. Prospects for renewable energy in Tasmania

World-wide concern about climate change is providing a commercial environment strongly favouring the expansion of renewable energy sources and energy efficiency. Tasmania is in many respects an ideal region to develop new sources of renewable energy to build on its hydro-electric system. However, expansion of its capacity for renewable energy depends on developing the markets to match.

The Kyoto Protocol has established mechanisms which create the conditions for these new sources of demand for emission-free energy. Tasmania is in a strong position to benefit from Kyoto's endorsement of 'baseline shifting' (under Article 3 Paragraphs 10-12 of the Protocol). This provision will allow a major energy using facility in Japan to relocate to Tasmania to benefit from the energy efficiencies of new technologies as well as from renewable energy. Australia's 'baseline' emissions under the Protocol will be adjusted accordingly, so that both Japan and Australia benefit. **Energy-intensive Japanese firms are now searching for opportunities to transfer facilities to countries such as Australia, and Tasmania is in an excellent position to take advantage of this.**

We briefly review the opportunities for development of renewable energy in Tasmania and the potential sources of demand for it.

New sources of electricity supply

Wind energy

It is widely recognised that Tasmania has excellent untapped wind energy potential that could be fed directly into the existing grid, especially in the north-west and north-east corners. The wind energy industry is booming internationally with over 20,000 turbines producing electricity world-wide. The European Union expects to increase the contribution of renewable energy sources from 4% to 8% of the total by 2005 with wind energy playing a major part. Installed wind energy capacity has been growing at

40% a year since 1991. In some countries wind energy is already competitive with fossil fuel power even without accounting for the environmental benefits. The unit price of wind energy is expected to fall by another 20-30% over the next several years.

The wind industry is a major employer. In Denmark it now employs more people than the fishing industry. Wind energy is complementary with hydro power – the dams can be closed when the wind is blowing thereby storing water for later use. New wind farms over the next decade could increase Tasmania's electricity generating capacity by 30% and possibly much more. This would require an installed wind energy capacity of around 900 MW and some upgrading of the grid. Not only could this electricity become competitive with mainland coal-based power, it would attract tradable emission credits worth around $65 million.[2]

Tasmania has the opportunity now to become the centre for the wind-energy industry in Australia. It has a number of advantages:

- an immediate initial market on King and Flinders Islands;
- the north west of the State, the area with most wind energy potential, is connected to the grid;
- it is highly compatible with hydro-power and increases the value of the water in the hydro dams; and
- under some circumstances, it has the potential to be exported to Victoria to complement or compete with brown coal generators.

Tasmania therefore provides an excellent market on which a new wind turbine manufacturing industry could be built. Launceston would be an ideal location for such an industry: it is near to a large wind resource, equipment could be exported to the Eastern States and Western Australia from its port, and it draws on the same skills as required for the some existing industries.

Biomass

Two million tonnes of forest biomass are wasted each year in Tasmania. Some of this could be turned into useable energy through combined cycle power plants or new technologies such as wood gasification. Using a third of this biomass could generate 300 MW continuously and would be entirely sustainable as long as the forests are harvested in a sustainable way.

Tasmania is heavily dependent on biomass for home heating and some industrial uses but biomass is burned very inefficiently. Direct burning of biomass using more efficient methods could also make a significant contribution to Tasmanian green energy supply. **Tasmania is very well placed to develop into a leader in biomass technologies both for home use and for export to the enormous markets overseas, especially in the developing world.** Tasmania is the second biggest manufacturer of

[2] This is based on an emission credit price of $25 per tonne of CO2. 900 MW of wind energy capacity (generating 300 MW average) would displace around 2.7 million tonnes of CO2 per annum from coal-fired power stations.

wood heaters in Australia even though wood heating is losing market share to electricity.

Energy efficiency

Energy is used very inefficiently in Tasmania. Large savings can be obtained from building design and insulation alone, as well as from adoption of more efficient appliances and industrial equipment. Energy efficiency programs such as those being developed and implemented by the NSW Sustainable Energy Development Authority could cut domestic and commercial electricity consumption by up to 30% over 10-15 years.

New sources of demand for electricity

Apart from exporting electricity to the mainland, there are other uses of emission-free electricity that would have environmental and economic benefits for Tasmania, including new industries attracted from other countries that have emission reduction obligations under the Kyoto Protocol. These include the following.

Home heating

There could be greater replacement of wood heaters with high-efficiency electric heat pumps. This would alleviate a significant environmental problem in Tasmania, one that also threatens the image of the State as a pollution-free place for tourism and settlement. Where firewood is still used it should be burned much more efficiently.

Electrification of vehicle fleet

Fuel-efficient vehicles are likely to play a major role in national efforts to reduce greenhouse gas and other atmospheric emissions over the next two decades. Hybrid vehicles relying on batteries boosted by petrol engines are now entering the market, and all of the big car makers are investing heavily in these new technologies.

Converting 50% of Tasmania's vehicles to electricity over the next 15 years through normal turnover could reduce the cost of imported petroleum products by around $60 million each year ($120 million if Commonwealth taxes are included).[3] This money would instead be spent largely on electrical energy produced in Tasmania, although there would be substantial savings in fuel bills due to the much higher fuel efficiency of the new vehicles.

The electrification of the vehicle fleet could be achieved through the normal process of turnover of the fleet, which takes around 20 years. However, price incentives such as differential registration fees could be used to hasten the turnover and ensure that electric vehicles are strongly favoured.

New industries

In response to the targets set for industrial countries at Kyoto, there are now opportunities to attract new energy-intensive manufacturing industries to

[3] Based on 1996/97 petrol imports of 480 Ml and a bulk delivered price of 25 cents/l.

Australia, especially from Japan, under the 'baseline shifting' provisions of the Protocol. There are also good prospects for rapid growth in a number of existing and emerging industries that together could significantly increase industrial demand for electricity. These industries include:

- dairy processing
- aquaculture
- food processing
- renewable energy equipment manufacturing
- niche manufacturing such as the catamaran business
- the wine industry specialising in boutique products
- segments of the information industries
- tourism.

Each of these growth sectors is consistent with or actively builds on Tasmania's clean green image.

In addition to new industries, consideration must be given to the hydro-electricity currently used by large industrial users in Tasmania. A large proportion of Tasmania's existing hydroelectricity is tied up in contracts with major industrial users. Comalco currently absorbs around 25% of total supply and other major industrial users absorb another 25% or more. This energy is supplied at very low prices providing a poor return to the Tasmanian public for their investments over the decades in the HEC.

On the one hand, if Basslink became feasible the opportunity to export electricity to the mainland would change this situation dramatically. Comalco and the other big users would be competing against other buyers, namely distributors in the Eastern states or large industrial users on the mainland with contracts with the HEC.

On the other hand, corporations with energy intensive products have a growing obligation to reduce their greenhouse gas emissions. Closing down Bell Bay and its replacement by output from mainland smelters would make it more difficult for Comalco to meet its emission reduction commitments under the Federal Government's Greenhouse Challenge Program.

Employment opportunities

If Tasmania took the opportunity to pursue renewable energy to the full, it could become a world leader in some types of energy technology. It could become the centre for wind energy equipment in Australia. Export of skills and technologies developed from renewable energy industries could provide a significant source of high-quality employment. Already Tasmania exports skills associated with hydro-

electricity generation. **There is no reason why Tasmania could not become the Southern hemisphere focus for expertise in wind energy and sustainable use of biomass, providing highly-skilled, internationally demanded and well-paid employment for the next generation of Tasmanians.**

7. Tasmania's clean energy future

We can now put together the outlines of a renewable energy strategy for the economic development of Tasmania. Projecting 10-15 years into the future, we can envisage Tasmania developing into a state almost wholly reliant on renewable energy and attracting industry in search of emission-free energy. Under the right circumstances it may be feasible to export significant quantities of electricity to the mainland. The potential opportunities are summarised in the table below, building on the current 1150 MW average that the HEC system is capable of delivering on a sustained basis. The figures and the costings below are only approximations, but they are based on robust estimates of feasible outcomes.

Under this new strategy the supply of available renewable electricity will expand due to the growth of non-hydro renewables, especially wind energy, as well as from energy released through energy efficiency measures. Some of this additional supply will be absorbed by new and existing activities within Tasmania. Subsequent expansion of supply may be justified if the conditions develop for exporting electricity to the mainland.

Feasible renewable electricity supplies and demands in Tasmania, 2010-2015

New and existing sources of renewable electric power	**Extra supply in 2010 (MW)**
Wind energy	150
Hydro freed up through energy efficiency and direct solar in buildings and industry	150
Biomass	100
Current surplus of hydro-electricity	100+
New sources of demand for electricity	**New demand in 2010 (MW)**
Home heat pumps replacing biomass	60
New industries	240
Electrification of vehicle fleet	50
Surplus for additional industry or export	***150***

This strategy would have a large impact on Tasmania's 'balance of payments' with the rest of Australia. Savings on imports of petrol may exceed $120 million (including savings on excise) and an additional 300 MW average of new renewable energy would generate emission credits worth in excess of $60 million.

If Basslink were to proceed, the export of 300 MW to the mainland each year could generate revenues of $250-350 million, although expenditure on Basslink would offset some of this.[4] In addition, the tariffs charged to Comalco and other big industrial users could be increased substantially from the present rate of around 3 cents/kWh. If they decided that their operations became uneconomic then the surplus electricity could be sold at the higher rate to the mainland.

This strategy could generate significant new employment for the state in both new electricity generation and in the associated industries that could be built up to supply energy equipment in Tasmania, the mainland and the rest of the world.

Policy directions

Successful implementation of Tasmania's renewable energy development strategy depends on a strong policy framework in Tasmania and shifts in the commercial and regulatory landscape Australia-wide. The required changes are very much consistent with the direction in which the industrialised world is headed, a direction that has been given a huge boost by the Kyoto Protocol.

The broad policies required in Tasmania in order to reap the benefits of the renewable energy development strategy include:

- support development **of locally owned wind energy, biomass and other renewable energy industries** in a coordinated strategy to convert Tasmania to almost full renewable energy and to become a major exporter of green power technology;

- support the development of industries specialising in the **development of renewable energy technologies and manufacture of equipment** for wind energy, sustainable biomass and energy efficiency with a view to make Tasmania the technological leader in Australia;

- take the lead among Australian states in **encouraging Japanese firms to relocate in Tasmania under the baseline shifting** provisions of the Kyoto Protocol;

- introduce a range of measures to substantially **increase the energy efficiency of houses, offices and factories**;

- develop and gradually introduce a package of charges, subsidies and mandatory

[4] Base-load coal-based electricity in Victoria will wholesale for around 2.5c/kWh in the longer term. With a reasonable carbon tax this would increase to around 4.5 cents for black coal and 6 cents for brown coal. (The same price effects would apply if tradable credits were earned for emissions saved instead of a carbon taxes paid on emissions.) Wind energy in Tasmania would wholesale for around 5.5 cents/kWh falling to perhaps 3.5 cents as technology improves over the next 5-10 years. To this must be added the cost of transmission across the Bass Strait amounting to around 1.5 cents/kWh.

fuel efficiency standards to bring about **electrification of the Tasmanian vehicle fleet**; and

- work with Federal and state governments to ensure a **fair deal for renewables in the national electricity market**, one that applies proper pricing to the environmental benefits of renewable energy.