



Secretary:.....

RECEIVED

27 NOV 2003

HOUSE OF REPRESENTATIVES
STANDING COMMITTEE ON
ENVIRONMENT AND HERITAGE

Origin Energy Submission to the House of Representatives
Standing Committee on Environment and Heritage's
Discussion Paper

Sustainable Cities 2025

Introduction

Origin has a heritage of over 140 years of operating in Australia and is one of Australia's leading providers of energy and energy related products and services, with significant positions in exploration and production, power generation, retail and trading, as well as investments in and management of distribution networks. Origin has about 3000 employees, supplying natural gas, LPG and electricity to over 2 million customers throughout Australia, New Zealand and the near Pacific.

Origin is the largest energy retailer in Victoria, and the second largest retailer nationally. In 2002/3, Origin supplied 123 PJ of natural gas, 479 ktonnes of LPG and 15TWh of electricity. Origin is also one of the largest wholesalers in the National Electricity Market (NEM) and has interests in 886 MW of power generation in Australia. Origin's gas-fired generation portfolio reduced greenhouse gas emissions by over 1 million tonnes last year compared with the NEM average.

Origin purchases electricity from renewable sources to meet our obligations under the *Renewable Energy (Electricity) Act 2000* and to cover our sales of GreenEarth electricity retail products. Origin Energy offers two of the leading Green Power products in Australia and has achieved Green Power sales to over 30,000 customers in the last financial year. Origin currently has 120 MW of Victorian wind capacity under contract (Codrington, Toora, Chalicum Hills and Yambuk), and has plans to develop wind-generating capacity in its own right. Origin is also investing in a demonstration plant during 2003/4 to commercialise Australian IP for innovative solar photovoltaic panels.

In upstream activities, Origin holds significant exploration and production interests. Origin produced 74PJ of gas and 854,000 bbls of oil in 2002/3 and had 2P reserves totalling 1,573PJ as at 30 June 2003. In June 2001, the company's strategy to locate and commercialise gas close to market led to the discovery of the large Thylacine and Geographe gas fields in the offshore Otway Basin, from which the first gas deliveries are expected in 2006. The BassGas Project, which will develop the Yolla gas field in Bass Strait, is set to commence production in mid 2004. These fields will mostly supply the Victorian and South Australian markets.

Origin believes major energy producers and consumers must acknowledge that we are now operating in an environment increasingly constrained in its ability to

absorb greenhouse gases without unacceptable environmental impacts. In response to this, Origin released its first Sustainability Report in April 2002. This report addressed the social, environmental and economic impacts of our business and sets out a comprehensive list of strategies and actions.

Specific Comments on the Sustainable Cities 2025 Discussion Paper

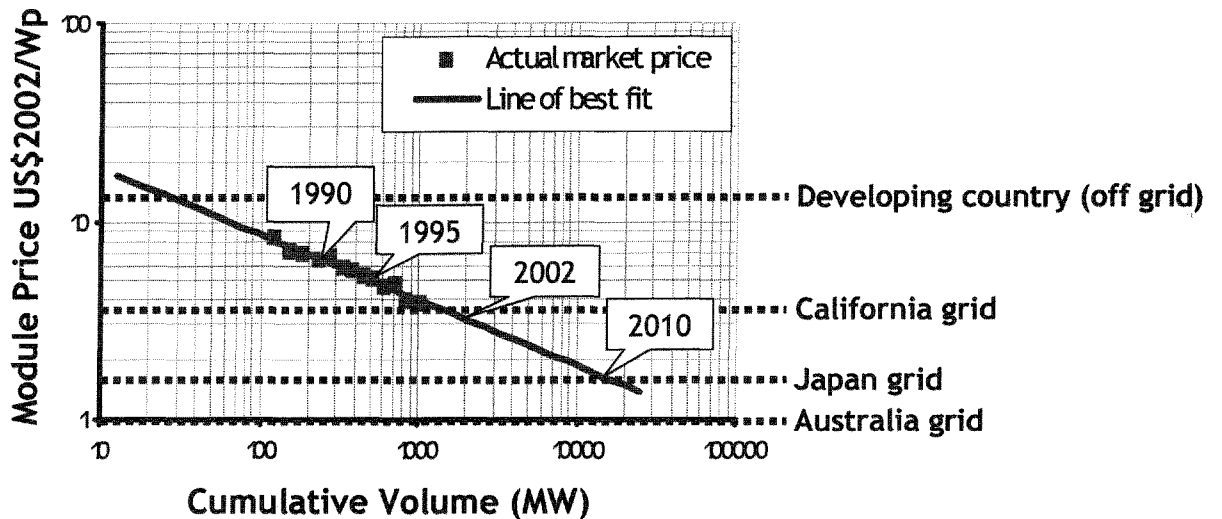
2. *Ensure equitable access to and efficient use of energy, including renewable energy sources*

- ***How might we implement a shift from the existing large-scale energy generation and distribution infrastructure towards an alternative model?***

By the time we are approaching 2025, we envision that we will be incorporating a higher proportion of renewable energy than we have today, and we expect a strong emphasis on distributed energy. It is feasible that developments in technology will result in more wide-spread availability of hydrogen as an energy carrier but the source of hydrogen is likely to be still fossil fuels such as compressed natural gas.

It is feasible that solar photovoltaic (PV) electricity will power homes during the day, with potential for power supply from fuel cells at night.

The graph below projects the cost of solar should the industry continue to grow at 30%p.a. (which it has for the last 10 years). It shows that around 2015, solar will be at US\$1 to US\$1.50 - which will put it equal to grid power.



To deliver this future, however, there needs to be changes to the way we plan our residential developments and the associated energy infrastructure. Scale is also an important factor in the uptake of solar PV modules; these modules must become an appliance commodity within the reach of all in the community. The volume of solar PV system sales needs therefore to increase dramatically to deliver the scale benefits of lower price per unit to compete with centralised grid power.

The current price of solar is high compared with grid power in Australia, however large-scale grid power rarely represents the true cost of delivered electricity. Large power stations in Australia are mostly coal-fired and the price of the electricity produced does not include the externality costs of:

- Greenhouse emissions and
- Pollution in the form of air pollution and waste material from scrubbers

Including the full costs of electricity generated and delivered to consumers would substantially improve the economics of distributed renewable generation including solar photovoltaics, small scale wind, and run-of-the-river micro-hydro as renewable generation avoids these externalities. Of these, only solar photovoltaics can be used in all Australian geographic regions to power most homes.

Industry is currently working with the Federal and State Governments to develop appropriate programs to support the development of solar pv technologies within Australia with the aim of reducing final costs of solar systems to consumers. Concessions directly assisting consumers to purchase solar photovoltaics have proven extremely successful in Japan, Germany and the US at encouraging the growth of distributed renewable generation.

Planning considerations for fuel cell or micro-turbine applications will be vital to ensure accessibility. Natural gas and/or LPG supply offers a flexible range of future options, for example, power supply to operate micro-turbines, as a source of hydrogen for fuel cells, to boost the operation of solar hot water systems and in addition the more traditional applications of space heating and cooking.

But there needs to be a holistic approach to urban planning and development, including building codes to ensure that these options for distributed power are not closed off to consumers due to infrastructure constraints, poor planning or limited awareness of impending technological developments.

In addition, education will also be an important element in the change to a distributed model. It is important to focus on education within our schools now to ensure that effective change is in place to meet the aspiration for sustainable cities by 2025. It is obvious that we need to rethink how to change both the supply and demand sides of the energy equation to ensure that our collective understanding of the alternatives allows for innovation and creative solutions.

- *How can the uptake of renewable energy for residential and commercial properties be promoted?*

Energy, particularly electricity supply, is not fully appreciated in Australia because it is inexpensive, invisible, and readily available at the flick of a switch. Energy awareness is therefore a vital pre-requisite for a change to renewable energy to occur. This awareness can be provided by initiatives including introducing energy into school curricula and rewarding best practice.

Origin Energy has worked closely with our customers to raise their awareness of energy choices, including Green Power products from renewable sources. Origin has more than 30,000 customers buying Green Power, more than any other energy retailer in Australia. We have had extensive experience promoting and selling Green Power and from this experience we have learned a number of things.

1. Although there is a general awareness in the community of global warming and the association with greenhouse gases (GHGs), few people understand that the production of electricity by burning fossil fuels is the single biggest contributor of greenhouse gases in Australia. Market research suggests that most people believe electricity is generated from hydro power. Before a solution can be marketed the problem must be understood. There needs to be a raising of awareness of the link between electricity generation from fossil fuels and greenhouse gases. Until the community understand this link the take up of the "solution" will be low and costly to sell.
2. Marketing of electricity and renewable electricity products is very difficult as they fall into a low interest and low involvement category. Through our experience the only way to get customer involvement is to deal with them one-on-one via door-to-door contact or telemarketing. Putting aside the dislike for these intrusive selling methods, they are the only effective way to explain the problem and get commitment to the solution. Because of competition in the electricity retail market, customers now must sign contracts or give explicit informed consent when taking up a new product. In NSW this can not be done over the phone which limits the opportunities for personal dialogue. Direct contact has been demonstrated to be the most effective approach but it must be noted that unfortunately these sales channels are expensive. These costs need therefore to be recovered through the pricing of the product.
3. There is a higher take up of Green Power in terms of customer numbers by residential customers than commercial. Our experience suggests 60:1 This is partially due to the sheer number of residential customers vs commercial, but it is also due to cost. Residential customers are prepared to pay a small premium or forgo a discount; business customers are very cost conscious and generally opt for a discount on energy in preference to assisting the environment. Some form of compensation via tax or rebate may assist the take up of renewable energy to business.

Options for promoting renewable energy for residential and commercial properties include:

1. Raising awareness of the link between electricity generation from fossil fuels and greenhouse gas emissions. This is a community problem and should be funded by the community. Greater awareness will assist in creating greater demand for cleaner options and may lead to lowering the cost of existing channels and open up the opportunity of cheaper fulfilment channels, ie Direct Mail
 2. As it stands at the moment individuals are responsible for taking up the solution. As stated above it is expensive but necessary to do one-on-one marketing. The alternative would be the formation of estate body corporates who would be responsible for purchasing renewable energy on behalf of all the residents.
 3. The first consideration when evaluating solutions to lowering GHG emissions should always be implementation of energy efficiency through better housing design, the adoption of the highest star-rated energy efficient appliances, use of natural gas over electricity in water heating and space heating and the adoption of gas-boosted solar water heaters. These measures, if properly implemented, are very likely to have a lasting effect in lowering GHGs. Renewable energy should complement appropriate energy efficiency measures.
- *What are the impediments to utilising renewable energy sources in residential, commercial and industrial areas and how might these be addressed?*

This has been largely discussed above, except for one aspect. Another major boost to the introduction of renewable energy sources would be recognising the savings in transmission and distribution infrastructure created by introducing distributed generation.

- *Should renewable energy generation be promoted at the single dwelling level or across city regions?*

Whether renewable energy should be promoted at the single dwelling level or across city regions is really a tactical issue and should be part of a bigger marketing/promotional strategy. There is potentially a role for local government, although their success in gaining community support to date through Cities for Climate Change Protection® has been limited. This is possibly due to lack of adequate funds and their credibility as experts in energy and energy related products and climate change.

Renewable energy delivery is most effective at the single dwelling level. This has many advantages:

- It can drive the cost of renewable technologies down faster because the higher volume of unit sales will increasingly turn pv modules into accessible appliances, available from a wide range of suppliers

- It improves the user's understanding of energy - which in turn can lead to behavioural change as consumers become more responsible (less wasteful) with energy use as they attempt to balance energy consumption with generation from their system.
- It increases the number of generators - reducing the risk of system outages
- The generators are spread across the city (eg solar systems on every roof) eliminating the need for large, cumbersome and real-estate intensive generators.
- Provides local employment

- ***Are there economic, and hence social, implications of a city increasing its use of green power and developing new complexes which are predominantly self-sufficient in terms of energy generation?***

There are positive implications for the increasing use of renewable and distributed power systems including jobs, security of supply, sustainable management of energy and reduced environmental impact.

- ***Should higher efficiency standards be mandated for all new dwellings, appliances and business operations?***

Yes. Higher energy efficiency standards are a win-win for all parties. Energy bills are reduced resulting in improved profitability for businesses and greater wealth for residents, emissions are reduced and infrastructure investment in upgrading transmission and distribution networks is reduced.

Further, energy efficient buildings often have a better quality of light, improved thermal comfort, greater occupant control (eg with operable windows) and are often healthier due to reduced recirculation of bacteria and airborne viruses. A healthier, happier workforce means improved productivity and lower labour costs.

ABARE and others have forecast significant demand growth out to 2020 (of the order of a 50% increase on 2003 demand) and in order to manage this demand it will be important to employ a wide range of energy efficiency measures.

- ***How can residential and commercial developments incorporate renewable energy generation into planning and construction?***

Renewable energy can be readily and unobtrusively integrated into residential and commercial buildings. Most home roofs in Australia are at a pitch well suited to solar photovoltaics which can therefore be attached flat onto the roof - providing the block and house orientation are appropriate. For commercial buildings, Building Integrated Photovoltaics (BIPV) allows integration of solar photovoltaics into facades, awnings, shade structures and roofs.

It is also viable to incorporate micro-wind turbines in commercial developments with appropriate planning or even retrofit to existing buildings.

- *To what extent should public transport systems seek to change to renewable energy sources?*

Origin Energy considers public transport systems as excellent conduits for the take up of new technologies and alternative fuel options including renewable energy sources of the future.

Given the key focus of public transport to provide community services, if the adoption of new technology or alternative fuel options can combine the required community services whilst improving the environmental and health impacts of transport functions, then such options are worth pursuing. Ideally the adoption of alternative or renewable fuel options should be achieved through cost neutral or cost reduction means, however in certain cases the adoption of new technology into public transport systems at a cost premium is justifiable to provide a demonstration to the broader transport sector of the technological validity of new technologies and fuel choices.

Origin has had a long and instrumental involvement with the development of Compressed Natural Gas (CNG) as a bus fuel, during which time CNG has become an integral part of the Australian urban bus fleet. Natural gas has and will continue to play a key role towards the eventual development of renewable options within the public transport fleets.

5. Develop sustainable transport networks, nodal complementarity and logistics.

- *Should new transport technologies, such as electric cars and buses, be promoted as alternative to conventional fuels?*

The promotion of new technologies, such as electric cars and buses, requires appropriate consideration of the pros and cons of such technologies. In some cases what is suitable for buses may not be suitable for cars. Neither is it always the case that a new technology provides a better option to existing alternatives. Key considerations include full-fuel cycle energy use, full-fuel cycle environmental and health impacts, energy source issues (particularly with a view to Australian energy sources) and whole-of-life cost comparison.

The current reality of electric vehicles is that they have not reached community expectation for convenience and cost, added to which the full-fuel cycle outcomes are variable and at times unfavourable. There is a risk that the introduction of electric cars will simply shift the environmental burden to the point of generation rather than the tailpipe. Therefore it is critical to for

authorities and the community to value the environmental impact of any fuel throughout its entire supply chain.

A major success story in the Australian transport fleet of an alternative fuel option has been the development of the LPG industry based primarily on the car fleet, which has delivered cost reductions and health and environmental benefits. In addition there has been growth in the use of CNG within the urban bus fleets. Both of these options can continue to play significant roles in the transition to a renewable fuels era, including use within fuel cells as a primary fuel source.

Petrol and diesel fuels are also improving in quality due to more stringent specifications. This has led to increased focus on vehicle technologies to utilise these fuels. As a result, there has been a reduced effort to improve LPG and CNG vehicle technologies. This issue needs to be addressed to ensure that the range of options available to motorists in the future includes the best possible combination of fuel and vehicle technology.

- *What are the features needed in new settlement areas to encourage more diverse and sustainable transport networks?*

Origin Energy's views on this question are restricted to energy related issues.

Given the expectation that new settlements in the foreseeable future will continue to depend on a combination of personal, commercial and community transport solutions, encouragement of the take up of alternative and renewable fuel options can be achieved by the early establishment of the infrastructure to provide access to fuels other than the traditional options.

Experience shows that the establishment of infrastructure to cater for a transition to non-traditional fuels is expensive, until sufficient market growth is achieved. This can present a barrier to investment. In such circumstances, it becomes an issue for Government policy to determine the extent and nature of assistance that should be provided to ensure the successful establishment of fuel choice options to move towards more sustainable transport outcomes.

Origin supports the development of more sustainable transport outcomes and encourages the setting of suitable policy mechanisms to promote investment towards the desired outcomes.

6. Incorporate eco-efficiency principles into new buildings and housing

- *How can green construction and refurbishment techniques be integrated into standard building practices?*

Mandating requirements for green buildings is the most effective way to ensure that energy efficient techniques are employed. Because these requirements usually pay for themselves very quickly, such mandates are ultimately a benefit to home and building owners based on the savings on energy bills which will accrue over the life of the house/building.

To accompany regulations, training and manuals are needed to educate builders and designers about the new requirements. This only has to be done once as subsequent generations grow up with the green requirements as standard.

- ***How can eco-efficiency innovations be promoted to achieve a market value in both commercial and residential buildings?***

What is currently missing is a comprehensive appreciation of the value eco-efficiency. For example, a home that uses 50% less energy than an average house will save its occupants around \$800p.a. Assuming a mortgage rate of 7% and inflation of 2.5%, this would mean that the buyer could afford to spend \$12,000 on the house and be no worse off. However, most home and building buyers are concerned about the up-front amount rather than the whole-of-life cost.

Some lending institutions (such as Bendigo Bank) have recognised that lower energy bills mean that homeowners are more able to pay off their mortgage and therefore represent a lower risk. That is why they are offering lower mortgage rates for eco-homes. However not all decisions are made on a strictly rational basis - it is important to ensure that the designs and features also appeal to the emotional elements of our decision-making.

- ***What are the impediments to eco-efficiency principles being taken up across new housing developments and commercial areas?***

The situation is often that developers and tenants have different drivers. Developers are reluctant to risk alienating the market with unusual designs and need some certainty that their product will sell.

The City of Melbourne has developed an innovative solution to this stand-off in its Zero Net Emissions by 2020: A Roadmap to a Climate Neutral City. The Council is soliciting the names of tenants who would be interested in taking space in an eco-efficient commercial building. Once sufficient interest is gained, the Council is offering developers the chance to build an eco-efficient building for these future tenants. This is a great idea that could also be done for housing developers.

- ***Are existing building standards and product labelling sufficient to enable informed consumer choices and to ensure that the use of eco-efficiency materials and designs are maximised?***

Australia is a world-leader in its Energy Star rating system for appliances and vehicles. However, our building standards are lower than some other developed countries, for example, Scandinavian countries. While Victoria has recently mandated 5 star homes, this type of thinking needs to spread around Australia. Once the financial and comfort benefits of 5 star rated homes are widely recognised, the momentum and consumer support will exist to lift to 6 star and beyond.