



House of Representatives Standing Committee on Environment and Heritage

Inquiry into Sustainable Cities 2025

Submission from:

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Responses to Selected Questions Posed in the Discussion Paper:

Sustainable Cities 2025: A Blueprint for the Future

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?***

Current energy regulations favour central generation and supply side solutions. Although regulators have begun to take an interest in demand side options, these are not yet appropriately supported and are difficult to implement given that the electricity industry makes its income from selling electricity and most consumers have limited understanding or involvement in electricity decision making at personal or community level. Key issues here include the uniform tariff policies and the continued preference for cumulative rather than interval electricity meters. The former stops any signal regarding the actual cost of electricity supply from reaching the consumer. Although this is in place for socio-political reasons and is unlikely to be changed in the short term, there needs to be a clear understanding at the supply level of the actual costs of supply to each customer, so that the cost of the social obligation can be separately assessed. Similarly, cumulative energy meters provide no mechanism to give signals to consumers about preferred time of electricity use. Interval metering is crucial for this as supply costs are a combination of energy and network costs. The latter is increasingly impacted by time of use.

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

The introduction of uniform mandatory energy standards for new buildings and major retrofits must be fast tracked. Renewable energy options from passive solar design through to solar water heaters and photovoltaic (PV) systems can readily be included. Such an approach will immediately alert developers to the cost effectiveness of correct building orientation and preservation of solar access. This in itself is the crucial first step in facilitating the use, either at construction or later on, of solar technologies.

- ***What are the impediments to utilising renewable energy sources in residential, commercial and industrial areas and how might these be addressed?***

Recent trends to urban consolidation have had severe impacts on solar access and have thus eliminated the option of many solar technologies for the life of the development – perhaps several hundred years. In addition to the inability of many buildings to capture passive solar benefits or to use solar waters or PV systems, an important but

little discussed impact of trends to higher density has been the elimination of backyard space for clothes drying. The latter has resulted in many new residential developments relying totally on electric or gas clothes dryers, with substantial increases in household energy use and its associated impacts. In a country with so much sun, increasing use of electricity and gas to dry clothes is a major policy failure.

Solar access criteria should be a mandatory part of all building development application processes.

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

Both. Technologies such as solar water heaters and PV are well suited to individual dwellings. Wind generators, landfill gas, waste to energy and biofuels are better suited to community level implementation or regional planning and promotion. However, clear strategies at local government, region, State or national level will be an important driver towards their adoption at whatever level is appropriate.

- ***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?***

Green power options are typically implemented at a local level. Hence there is a much higher opportunity for community involvement, local jobs and hence local benefit than is the case for central energy systems. Regional energy self sufficiency also provides a more resilient energy infrastructure – one less susceptible to disruption from technical breakdown, fuel availability or industrial, political or terrorist threats. Public education and involvement is crucial to increased uptake and community support.

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

Yes. See previous discussion on the need for mandatory energy standards. Reducing energy use at the consumer end has far more impact than efficiency increases at the supply side, because of the system losses in the delivery chain. For example, one kilowatt hour of electricity saved at end use, which is equivalent to 3.6 MJ of energy, actually saves around 10.8 MJ of primary energy. This has major impacts both on fuel use and on network requirements.

Australia did not follow international trends in the 1970's and 1980's towards high efficiency standards. Hence many appliances available here use significantly more energy than their equivalents in Europe. There is large scope for energy efficiency improvements across the board in Australia. The Electricity Supply Association of Australia has indicated that 30 Terrawatt hours could be saved by 2010.

An important impact of reduced energy requirements is that renewable energy options become much more affordable. For example, an energy efficient house may use only

10 kWh per day, compared to a standard house using say 25 kWh per day. Not only will electricity bills be reduced from \$1100 to \$440 per year, but this level of electricity could be supplied by a 2 kW PV system costing around \$20,000 (or \$16,000 with current grants), rather than needing a 5 KW system which would cost \$50,000 (\$46,000 with grant).

With all energy discussion currently premised on supply side solutions, there is the need for significant levels of consumer education, as well as clear support at all levels of government for demand side solutions. Without this it is unlikely that the community, and consumers, will feel either motivated or empowered to make changes to their energy consumption patterns.

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

As previously discussed, incorporation of solar access considerations is the first priority. This should be reinforced via mandatory building energy standards. Renewable energy options can be included in the list of eligible solutions towards reaching, for instance, a 5 star rating. Solar water heaters are included as an eligible option in the new Victorian building standards.

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

There is some scope for bus fleets to be operated on biofuels, including recycled waste oils, bio-diesel and biogas. This is feasible at a regional level and should be actively encouraged as part of regional planning processes.

For electric trains or buses, renewable energy can be incorporated via the recharging facility or via the main grid supply. This may be a longer term solution. However, internationally, PV has been used on roofs of bus recharging stations and along freeways and other transport corridors. Central generation of renewable electricity for transport systems can be undertaken as for other uses, via wind farms, hydro systems or PV power stations.

A more crucial concern for areas currently being developed is whether there is access to public transport at all.

Develop urban plans that accommodate lifestyle and business opportunities

Urban design has a large impact on energy use. According to the Australian Greenhouse Office, local government decisions impact on 50% of Australia's greenhouse gas emissions. Hence urban planning must consider energy implications. Recent large areas of housing development in Western Sydney have been allowed to occur with little or no consideration given to access to public transport, schools, work, shops or green spaces, nor to the water or energy infrastructure requirements they impose. Hence the families moving into these areas must rely on private cars for almost all their activities. The houses themselves are typically with no eaves, no consideration given to orientation, no room for shade trees, low levels of insulation and high reliance on air conditioning. Electricity use, especially on hot summer days is now a critical issue for local electricity network suppliers and network upgrade is set to cost several billion dollars over the coming decade. Similar developments, and problems, are occurring in South Australia and in other States.

Simple measures at household level, such as appropriate orientation, insulation or shading of west faces, which may add from zero to several hundred dollars to the cost of a house, could save thousands of dollars in infrastructure upgrade requirements. Similarly, planning for the incorporation of new schools and shops into all new developments would significantly reduce the need for new freeways or other significant transport systems and will also reduce energy use and air pollution.

Each individual developer cannot expect to be able to see the impact of their single development on the total system. Urban planning must be done in a coordinated manner at local, regional and State level, with appropriate support at national level.