



Sustainable Energy Development Office
Government of **Western Australia**

Our ref: SED/0081
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Environment and Heritage Committee
House of Representatives
Parliament House
CANBERRA ACT 2600

Dear Sir/Madam

INQUIRY INTO SUSTAINABLE CITIES 2025

Thank you for the opportunity to comment on the discussion paper released for the inquiry into *Sustainable Cities 2025*.

The attached submission provides comments on some of the issues that influence the level of uptake of renewable energy and energy efficient practices in cities. As you will be aware, several government processes that are currently underway, both nationally and in Western Australia, have aims that relate to many of the issues raised in the discussion paper. These include the development of a National Framework for Energy Efficiency, which is a joint States and Commonwealth initiative overseen by the Ministerial Council on Energy. At the State level, the structure of the Western Australian electricity supply industry, and the regulatory arrangements governing the industry, are being reformed. It is anticipated that one of the outcomes of that reform process will be an increased capacity for renewable energy generators and demand side options to play a role in the Western Australian electricity market.

If you would like to discuss any of the issues raised in this submission, please contact Tony Stewart on 9420 5645.

Yours sincerely

DAVID HARRIES
EXECUTIVE DIRECTOR

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Inquiry into Sustainable Cities 2025

Western Australian Sustainable Energy Development Office (SEDO) submission

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

The discussion pertaining to Section 2 makes reference to the need to increase the efficiency with which energy is used and to decouple economic growth from energy use. The need to increase reliance on renewable energy receives less emphasis and is attached to a caveat that it should be increased “where possible and appropriate”. This emphasis is reversed, however, in the Questions for Consideration, with most of the questions relating to distributed generation, renewable energy, energy self-sufficiency and green power, and only one of the questions relating to the strategy of increasing the efficiency of energy use. Not only is the lack of emphasis on energy efficiency in the Questions for Consideration at odds with the discussion section above it, but it appears to be at odds with the many studies, both within Australia and elsewhere, that have identified very significant scope for cost-effective energy efficiency improvements in all sectors and for increased reliance on demand side participation in energy markets. These studies have shown that in terms of reducing the environmental impacts of energy production and use, energy efficiency has a potentially very important role to play.

There is wide scope for the adoption of energy efficient practices (or more broadly, demand management, which includes changes in patterns of consumption to manage the peak demand and greater use of distributed generation) by the residential, commercial and industrial sectors. Many of these available opportunities are not currently being utilised and this has been attributed to a number of factors. Some of the factors commonly advanced to explain this failure are:

- The lack of a nationally consistent framework that costs the environmental and social benefits of increased energy efficiency, such as the reduced emission of greenhouse gases and local pollutants.
- A lack of information and understanding by end users of the opportunities for energy efficiency and demand management available to them and of the cost benefits of taking up these opportunities.
- High upfront cost, which can deter individuals and businesses from investing in energy efficiency options even where the payback periods are very short.
- Barriers to demand management participation in the electricity market, such as a lack of price signal, which recognises (when appropriate) the benefit of a demand side response over network augmentation or increased generation.
- Cultural factors, such as end user preferences for simplicity, convenience and ‘luxury’, and a lack of understanding or concern about environmental issues, will limit the uptake of energy efficiency by end users.
- The involvement in energy efficiency of markets other than just energy markets, such as electrical appliances and housing, and the involvement of actions that cross traditional business boundaries (for example, in the case of land developers and tenants of commercial buildings).

With regard to renewable energy, there are many different ways that it can be utilised in the residential, commercial and industrial sectors in cities. Households or companies can choose to install a renewable energy electricity generator, such as a photovoltaic array, or a solar hot water system on their houses or buildings. They are also able to contract with an electricity generator or retailer to ensure that their electricity, or a portion of it, is produced from renewable energy sources. The renewable energy generator may or may not be located close to their property or even within the city borders (which illustrates a potential difficulty, where energy is concerned, in separating decision making for cities and for regional areas). It is often the case that locations with good renewable energy resources do not coincide with load centres or with locations that are appropriate for the utilisation of the resource. In most cases, for example, there are likely to be real restrictions on the ability to locate wind energy turbines within a city area.

As with energy efficiency, there is a range of economic, financial, structural, technical and cultural barriers to the increased use of renewable energy. Barriers that are commonly cited to be the key barriers are:

- The lack of a framework that puts costs on the environmental and social impacts of electricity generation, such as the emission of greenhouse gases and local pollutants. Thus, these benefits of renewable energy generation over conventional fossil fuel based electricity generation, are not recognised in the market.
- The high cost of producing energy from some renewable energy sources or technologies. This is particularly the case for some of the renewable energy generators that are suitable for city locations, such as rooftop photovoltaic systems. It presents a barrier to their purchase by households and businesses.
- Barriers to renewable energy participation in the electricity market, which can include having to compete with a monopoly electricity utility, difficulties in gaining access to distribution networks, weak price signals, difficulties in securing financing, treatment of balancing issues which disadvantages intermittent generators and information asymmetry which disadvantages small players. These issues are currently being addressed in Western Australia within the electricity reform process.
- Community concerns about the perceived potential negative impacts (such as loss of visual amenity and production of noxious substances) of some renewable energy generators, such as wind farms and waste-to-energy plants. This level of concern is closely related to the siting of proposed renewable energy projects, the planning and environmental approval processes, and the perception and understanding of these processes and their impacts in the community.
- The lack of understanding in the community of issues relating to renewable energy and renewable energy technologies. Many individuals and businesses are unaware of the renewable energy options that are available to them and have misconceptions about the technologies, including perceptions relating to their reliability, or lack of reliability.

The barriers to energy efficiency and renewable energy have been the subject of considerable debate and many strategies have been advanced for reducing or addressing those barriers. These include:

- Introducing a national emissions trading scheme.
- Providing subsidies to renewable energy generators.

- Appropriate restructuring of the electricity industry or changes to current regulations and market rules to facilitate the participation of renewable energy and demand side options in the electricity market.
- Developing a planning and policy framework in which the environmental, social and economic costs and benefits of energy efficiency and renewable energy projects can be adequately assessed. This would ensure the development of appropriate projects (including appropriate siting) and to address community concerns and perceptions about the projects and the approval processes.
- Providing information to the community about renewable energy technologies and related climate change issues.

In terms of the need to facilitate a shift away from large-scale, centralised energy generation plant and a reliance on transmission and distribution infrastructure to supply the energy produced to end users, and towards an alternative model consisting of smaller and more distributed energy generation, there is a need to ask whether the environmental, economic and social benefits of such a shift would outweigh the costs of making that transition.

Increasing investment in distributed generation (such as renewable energy generators and co-generators located adjacent to load centres) into the existing network will have benefits up to a point in that it can reduce network losses and, therefore, reduce generation and network augmentation requirements. However, distributed generation does not provide the economies of scale that can be achieved with larger scale, centralised electricity generation. In addition, a distribution network allows generators connected to the network to provide a back up for intermittent generators on the network, such as those utilising solar and wind energy. Without the network, there would be a need to use energy storage or backup systems in conjunction with distributed generators, which would significantly increase the costs of supplying electricity in that way.

With regard to transport energy use, no cost-effective renewable energy public transport options are likely to be available in the short to mid term. One of the new technologies considered to have the potential to improve transport fuel efficiency is the fuel cell and fuel cell buses are currently being trialed in cities around the world (and will be trialed in Perth from 2004). These buses, however, are fuelled by hydrogen that is usually produced from natural gas. These types of technologies are generally considered to be transition solutions towards a renewable energy transport system. The hydrogen could be produced from the electrolysis of water using renewable energy. However, this is regarded as a longer term possible option.

With respect to higher efficiency standards for new dwellings, the Building Code of Australia (BCA) currently mandates a minimum level of energy performance for all new and refurbished houses. The BCA includes the option for demonstrating compliance with the minimum performance the use of a rating tool, the House Energy Rating Software (HERS). Currently, in order to comply, a building design must achieve a minimum rating of 4-star performance using the software. These tools are designed to take account of the iterative nature of technological improvement and it is highly likely that this minimum level will be increased in time to a 5-star or higher requirement as the software and housing technologies are developed. It is recognised that mandating the minimum energy performance of new dwellings is only a partial solution as the energy used by a household depends not only on the design features of the house, but also on how the

house is used by the occupants. Any proposal to legislate with regard to the behaviour of householders in order to minimise household energy use, however, would be highly contentious and, therefore, would be unlikely to be regarded as a politically acceptable option.

The extension of the BCA energy efficient measures to commercial class buildings is underway and this should assist in reducing the infrastructure demands placed on cities by new dwellings. Development of these requirements should be integrated with the development of Minimum Energy Performance standards (MEPs) for appliances, and could be developed along the lines of performance indicators, such as energy use per square metre for lighting or the coefficient of performance for heating and cooling equipment. Consideration could also be given to extending these requirements to existing building stock over time.

The energy efficiencies of appliances and equipment are covered under a National Appliance and Equipment Energy Efficiency program, which mandates a minimum standard of energy efficiency for certain appliances and other products. This program has been highly successful and is likely to be expanded to cover further types of electrical equipment. Effectively, the program eliminates worst practice by ensuring that only those new appliances with a level of energy performance above a set minimum are permitted to be sold in Australia. Accelerating this process and expanding the range of equipment covered under the program is crucial to reducing the environmental impact of energy use in the built environment. The Ministerial Council on Energy is currently developing a strategy for implementing this process.

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

Refer to comments related to higher energy efficiency standards in new dwellings under section 2.

7. Develop urban plans that accommodate lifestyle and business opportunities

Urban design is a key component for energy efficiency of the built form and, in particular, housing.

As housing designs become more energy efficient, the impact of the urban design and, in particular, the lot or block design, on the housing response becomes greater. Providing a property right to solar access, aspect and amenity may have to be considered to ensure that the benefits of energy efficient design are an enshrined right.

Methods to measure and rate solar performance are currently being developed and should be implemented on all new developments to ensure that the potential for energy efficient housing is maximised.