Submission to the 2010 WEM Report to the
Minister of Energy - Discussion Paper
Economic Regulation Authority
Governor Stirling Tower
197 St George's Terrace,
Perth, WA 6000
By email to: publicsubmissions@erawa.com.au

Monday 2nd August

Dear Mr Brown,

Submission to the 2010 WEM Report to the Minister - Discussion Paper

Sustainable Energy Now (SEN) thanks the Economic Regulation Authority for opportunity to comment and is pleased to present the attached document for submission.

SEN is particularly interested in urgent and effective reduction in greenhouse emissions and other environmental impacts, by the integrated implementation of increased efficiency, reduced waste, demand-side management and renewable energy systems, complemented with the use of electrified transport.

This holistic approach is necessary to ensure an effective and secure sustainable energy future.

Yours sincerely,

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Submission to the 2010 Wholesale Electricity Market Report to the Minister for Energy – Discussion Paper

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1. **Strategic, policy of high-level issues, including those raised in this Discussion Paper, that are impacting on the effectiveness of the WEM in meeting the Wholesale Market Objectives.**

1.1. General

Sustainable Energy Now Inc. (SEN) is pleased to have the opportunity to make a submission to the Annual Wholesale Electricity Market (WEM) Report to the Minister for Energy.

The objectives of the WEM relate to areas such as:

- providing efficient, safe and reliable production and supply of energy;
- encouraging competition;
- facilitating entry of new competitors;
- avoiding discrimination for particular energy options and technologies; and
- minimising the long-term cost of electricity from the South West Interconnected System (SWIS).

There are a number of factors that work against these objectives and fail to provide a transparent and equitable market for electricity on the WEM in Western Australia. We aim to address these in this submission.

The Strategic Energy Initiative 2030 (SEI2030) currently being developed by the Minister for Energy, on which SEN has also made a submission, has objectives to:

- propose an energy vision for 2030 to deliver certainty to investors, and to enhance future competitiveness and productivity;
- set clear goals to provide guidance for policy makers and investors, while maintaining flexible strategies to allow Western Australia to quickly adapt to take advantage of new opportunities and address emerging issues;
- estimate future supply and demand for energy under a range of likely scenarios; and
- ensure market and regulatory frameworks are responsive and flexible to meet the objectives of Government, industry and consumers;

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SEN encourages the integration of planning of both the WEM and the SEI2030, facilitated by the Office of Energy, and fully supports the need for a coordinated strategy to be put in place for the market's future development.

Only with a coordinated plan will Western Australia be able to access the vast renewable energy resources to deliver a clean, secure and sustainable energy system.

1.2. Renewable Energy Target (RET)

To meet the 2020 RET of 20% and beyond requires a plan to take advantage of the rollout of a range of renewable technologies. Starting from 2010, with just under 5% of the SWIS energy coming from renewables and assuming a growth in rate of electrical energy use of 2% per year, it will be necessary to grow renewable energy by just over 17% per year (Figure 1). Note that peak electrical energy demand has had strong growth of more than 2% per year and is forecast to continue growing faster than the increase of overnight off-

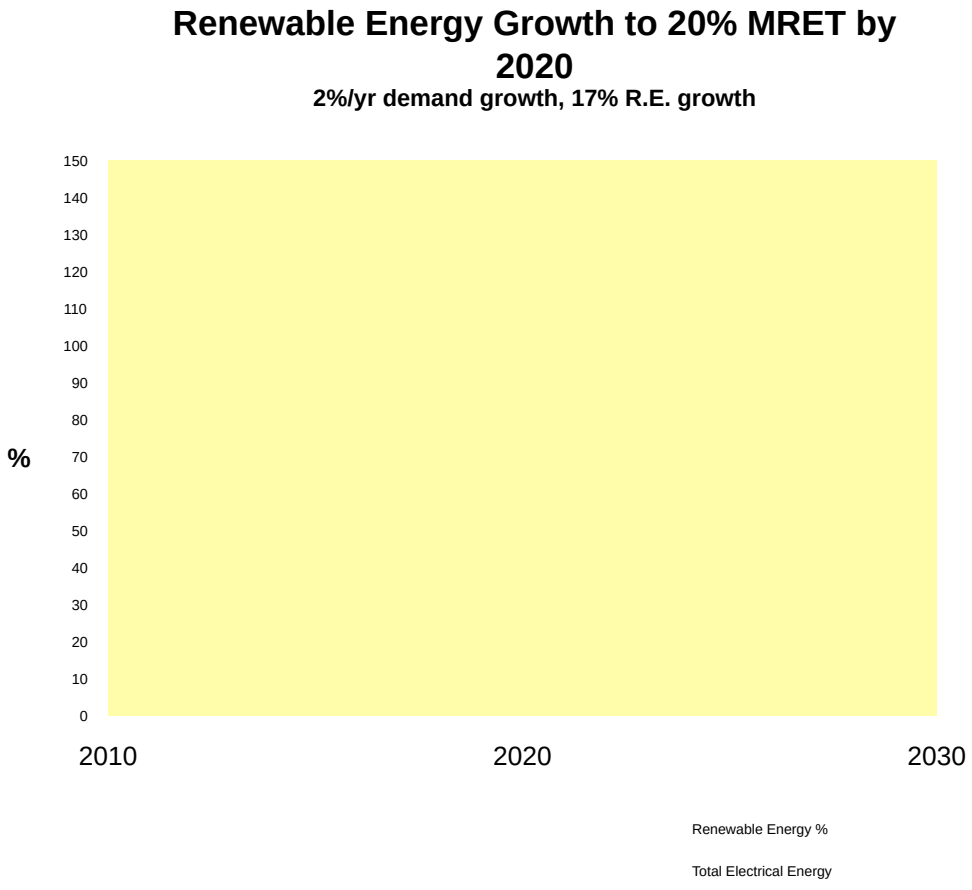

Figure 1

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peak (low) demand. Thus, implementing demand based reduction and efficiency will also be needed to stem the rise of costly peaking demand.

While 17% per year may seem ambitious, it is interesting to note that the global growth rates of wind energy and solar have each been around 25% per year for the last few years. With the correct regulatory and pricing structures in place through the WEM, the required growth is absolutely achievable.

Projecting further to 2030, that rate of growth could see approximately 50% of generation by renewables.

South Australia has a target of 33% renewable energy by 2020 and Victoria has recently announced a target of 5% solar by 2020, bringing its 2020 renewable energy to 25% (20% RET plus 5% solar). WA has a superior renewable energy resource to both SA and Victoria and could readily achieve higher penetration of renewable energy.

In order to achieve the RET target, market inequity needs to be addressed through appropriate design of the market, as per the WEM objectives.

Western Australia has the most abundant wind and solar resources in the country and has the opportunity to not only reach its RET target, but to realise export value of Renewable Energy Certificates (RECs) to other states.

1.3. Market Design

Regulations and coordinated planning are required to ensure that sufficient grid capacity and intelligence, as well as sufficient complementary ancillary services are in place to allow an increase in penetration of renewables. The costs of providing these need to be closely monitored to minimize rent-seeking, in particular ancillary services need to reflect the realized cost of supporting intermittent generation at least cost. For example, further investment in wind and solar forecasting, both daily and hourly, would allow for the provision of more efficient and cost effective ancillary services.

Changing the WEM to decrease discrimination and create a more equitable environment for renewable energy will ensure Western Australia can maximise the benefits from being one of, if not the highest, renewable resource areas in the world. Moving our energy framework toward enabling renewable energy penetration will support the WEM objective of providing efficient, safe and reliable production and supply of energy by:

- Providing a more resilient energy supply network through multiple dispersed energy sources.

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- Ensuring a more secure/stable energy cost due to the stable cost of fuel (zero) and no risk of carbon price induced increases to generation cost.
- Removing externalised impacts on health and the environment from non-renewable fuels and the extraction of them.
- Providing fuel security into the future with peak oil, gas and other finite resources an inevitability.
- Maximising efficiency by producing electricity from energy sources that are available for dispatch in alignment with demand peaks.
- Providing an interconnected, smart grid network with sufficient redundant-path capacity. Akin to the internet, these qualities increase resiliency against critical path failures due to the ability of other transmission infrastructure network to share the distribution of power.

2. Impact of feed-in tariff and renewable energy rebates/buy back schemes, as they relate to the efficiency, reliability and secruity objectives of the WEM.

Renewable energy policy in WA primarily consists of the RET and the solar feed in tariff for small scale generators.

The RET scheme will be successful as it has a relatively long-term objective with clear increments however, most market observers expect the 20% to be made up almost exclusively of wind. An apolitical long-term co-ordinated strategy is required to maximize the penetration and long-term benefit of renewable energy. The strategy should be multi-faceted; from land use to targeted government subsidy/partnerships to advising on international best standards for market services, etc. There is a rich cadre of knowledge in the metropolitan Universities that could be utilised to enhance such a strategy. State-based initiatives that are additional to the work required on market design and services should be strategically combined.

The introduction of specific, targeted policy such as gross feed-in tariffs for renewable energy is required to stimulate the market by creating an attractive predictable economic environment. This would begin to compensate somewhat for the bias in market pricing of renewable energy in the WEM. Bilateral contracts are essentially feed-in tariffs. They provide a high comparative advantage, particularly in financing and allow for relatively higher valuations of projects and lower interest rates (for capital borrowing) due to certainty of return. A feed in tariff for renewable generators will level the playing field, and provide some stability when sourcing financing for

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renewable energy infrastructure projects based on the annual estimate of generation, plus a set rate of return[1].

3. Reserve Capacity Credit allocation to Intermittent Generators

SEN is encouraged that work is being done in the Renewable Energy Generation Working Group (REWG) on the capacity methodology for awarding capacity credits to intermittent generators.

Technologies such as solar that have a very good correlation to times of peak market demand are currently discriminated against. The capacity credit mechanism is an essential part of the WEM so this discrimination is a major barrier to large scale solar projects being built. It is therefore critical that the capacity credit mechanism be changed to fully value the important contribution that renewable energy could make to the WEM.

Capacity credits are currently allocated to existing and new generators, and are based on the cost of building a 150MW OCGT including network connection. As existing generators don't have the cost of network connection, a proportion of credit for network connection those generators would normally receive could be diverted to network expansion into areas of high renewable energy resource. Having existing connected generators being paid the network connection portion of the capacity credit decreases economic efficiency.

The present system in place for energy supply in South-West WA is based on the idea that supply must follow demand. As such, there is little emphasis on modulating user demand. It works on the basis that our constant energy demand is met by baseload power supplies that are cheap but only when running continuously. To meet the peaks in our energy demand, massive amounts of costly infrastructure is needed for only occasional use, mainly in the summer when air conditioner use drives our energy consumption up dramatically for a few hours on very hot days. SEN considers further effort should be made to reduce the peaky nature for the SWIS demand.

[1] Sustainable Energy Now has created a conceptual simulation that when developed further to include half hourly meteorological data will be able to provide further calculation of estimate generation at certain locations in Western Australia, and with different types of renewable energy technologies.

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4. **Existing and potential impact of intermittent generation on the WEM, including the need for cost reflectivity under the existing framework and Market Rules.**

SEN acknowledges the market evolution currently underway such as the REWG, Oates review and SEI2030 as well as important work such as:

- Capacity Credit allocations for intermittent generators;
- Market design relating to day ahead planning and real time dispatch reflected in the operation of the Short Term Energy Market (STEM);
- Balancing market; and
- Ancillary services.

5. **Current framework for network access and the determination of capital contributions for augmentation to the shared transmission network provided by Western Power.**

Western Power's current network connection policy is a barrier to renewable energy. Other countries, such as Germany, have modified the generation connection regulations to guarantee that renewable energy projects are given priority over fossil fuel projects when attempting to connect to the network.

If this policy were applied in Western Australia, it would unlock significant investment in renewable energy and assist WA to move toward a lower carbon future.

SEN notes that investment 'uncertainty created by climate change policy' appears contradictory in light of the State Owned Generator's push to reopen Muja, and recent environmental approvals for three more coal-fired power stations. The driver of this may be the low network access and capital costs for augmentation that make this choice appealing, but is at the detriment of opportunity to reshape our WEM and network infrastructure. This would send the wrong signal to the market about becoming dynamic and sustainable with the penetration of renewable energy, not to mention the detrimental effect of the increased carbon pollution to our national security and sustainability if increasing coal generation.

SEN suggests that the complete lifecycle costs of fossil plants, which should include escalating fuel costs and the inevitable cost of carbon pollution, be accounted for in prioritising and encouraging new generation. This should be compared to the decreasing costs of renewable energy technologies resulting

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from increased production (mass production), increased scale of deployment, and improving technology.

Maximum penetration of renewable energy will be limited and not as effective without a transmissions and distribution system with the following capabilities:

- **Bi-directional energy flow**: Energy must be able to flow around the network from where power is generated to where it is needed; with the dispersed nature of renewables, this can change significantly.
- **Bi-directional data and load control enabling Demand-Side Management (DSM**): The load-shedding/adding and generation power must be coordinated rapidly (millisecond to ½-hrly) to match the two. This may be achieved with smart-meters/appliances able to load-shed/add very rapidly and controlled by system management.
- **Sufficient transmission capacity:** To allow large changes in direction of energy flow requires transmission infrastructure capacity to be sufficient throughout the system, rather than just at the 'core' as with conventional generation. This capability however, can also benefit physical security and reliability of the network by the fact that there is greater redundancy.

Moving away from our centralised capacity, which focuses on a small corridor, to expanding the network and generation capacity to areas of high renewable energy resource will also alleviate network transmission issues at fringe of grid locations, while creating more reliability across the network.

A strategic view of future transmission requirements should be undertaken to ensure new transmission lines are constructed to link areas with the best renewable energy source to areas of high electricity demand. Renewable technologies such as solar are ideally suited to the SWIS network due to their excellent correlation to times of peak network demand.

SEN's conceptual computer simulation, available at www.sen.asn.au/simulation, allows the planning and evaluation of scenarios for optimal locations to access renewable energy sources, while assessing grid connection costs.

There is an inequitable capital cost burden between incumbent generators and those accessing capacity in the existing network (as per the Western Power Generation Connection Capacity Map), and potential new network expansion to harness renewable energy resources. This needs to be balanced against the strategy to meet WEM objectives, particularly to avoid discrimination for particular energy technologies and in facilitating the entry of new competitors.

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6. Conclusion

SEN encourages the integration of review and planning processes currently under way on our WEM and electricity network for the development of the energy systems to realise the triple-bottom –line benefits of a low-carbon and more sustainable future using renewable energy.

SEN strongly urges that the implementation of this strategy be based on network and business modelling (such as SEN's computer simulation – refined and in greater detail) in order to help optimise integrated technical and cost outcomes. In conjunction with this, regulatory changes must be developed to drive the necessary investment and implementation within the strategic plan.

We look forward to further developments on this ambitious and very necessary strategy.
For further details and supporting information, please refer to the SEN submission to the Senate Economics Committee Inquiry into the Varanus Island Gas Explosion, and the SEN submission to the Strategic Energy Initiative 2030.

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