Environment Centre NT

protecting nature | living sustainably | creating a climate for change

Submission to the Northern Territory Inquiry into Electricity Pricing Options

Introduction

The Northern Territory, as a first world jurisdiction located in both the tropical and arid zones, is well placed to develop world class electricity grids, technology and pricing structures.

Climate change is one of the most pressing environmental, social and economic issues of our time. We need to begin acting now to avoid dangerous levels of climate change. Renewable energy is an important technology for reducing the NT's carbon footprint. The feed-in-tariff for renewable electricity generation, and planning a grid that is more capable of integrating renewables is vital to the future of the NT.

It has abundant solar resources - being a world solar hotspot - as well as opportunities to leverage large scale solar thermal, geothermal, tidal, wind, wave, and bio-gas electricity generation.

The Northern Territory has the perfect opportunity to rapidly move from its current status of lagging behind international efforts to address climate change, to become a global leader in renewable energy generation and inspire the rest of the world through these initiatives.

A plan to integrate these technologies has to be strategic, and has to start now, with a clear path to achieving the short, medium and long term outcomes. Research, and informed energy policies, implementing a Territory Renewable Energy Target (RET) tied to an integrated climate policy, a price on greenhouse gas emissions, along with electricity pricing tariffs and feed-in-tariffs for renewable energy are key to achieving these goals in the future.

The Role of the Environment Centre NT

The Environment Centre of the Northern Territory (NT) is the peak community sector environment organisation in the Northern Territory.

The mission of the Environment Centre NT is to

- protect and restore biodiversity, ecosystems and ecological processes,
- foster sustainable living and development, and
- cut greenhouse gas emissions and build renewable energy capacity.

The Environment Centre NT (ECNT) works by

- advocating for the improvement of environmental policies and performance of governments, landholders, business and industry;
- partnering on projects and campaigns with conservation and climate organisations, governments, Indigenous organisations, community groups, businesses, and landholders;
- raising awareness amongst community, government, business and industry about environmental issues and assisting people to reduce their environmental impact;
- supporting community members to participate in decision making processes and action;

- recognising the rights, aspirations, responsibilities and knowledge of the Territory's Indigenous peoples; and,
- acknowledging that environmental issues have a social dimension.

About the ECNT COOLmob Program

ECNT is encouraging innovation in sustainable living through its Community Solar and COOLmob programs. Since 2002 COOLmob has been delivering household sustainability education and outreach across Darwin and surrounding Top End towns. COOLmob also operates in Alice Springs through the Arid Lands Environment Centre.

COOLmob aims to motivate and assist people to reduce their environmental impact, predominantly through reducing energy, water and waste in their everyday lives.

Arising out of the Cool Communities program funded by the Federal Government, COOLmob's main focus has been on reducing household energy consumption via the delivery of home energy assessments and advice. COOLmob has been sponsored by NT Government and PowerWater Corporation to deliver home energy assessments (2002-2013) for the public and also for Hardship customers of PWC who are struggling to pay electricity bills. This Government support has been in recognition of the importance of reducing energy consumption (and associated carbon emissions) in the residential sector.

In this time, COOLmob has delivered at least 1000 home audits, helping Top End residents from many different backgrounds save energy at home. It is anticipated that the advice given in a COOLmob home audit can generate anywhere from 10% to 30% home energy savings. Based on the average consumption of a Darwin home, this equates to anywhere from 2.5kWh to 8.3kWh per day saved: over a year this represents **a $247 to $742 savings on home energy bills per household per year**. At over 1,000 households, this represents hundreds of thousands of dollars saved on bills, to be spent elsewhere in the local economy and relieving growing pressure on household cost of living. The greenhouse gases associated with these energy savings are significant: from an average 6.8 tonnes CO2e emitted per Darwin household per year, a savings of 10-30% will save 0.68-2.3 tonnes CO2e per year per home – for this cohort of 1,000 homes, at least 1,360 tonnes CO2e each year is possibly being saved.

In 2013 COOLmob succeeded in winning a $2.7M grant from the Federal Government's Low Income Energy Efficiency Program (LIEEP) and is now delivering the Smart Cooling in the Tropics project. Smart Cooling aims to bring home energy saving advice and information to targeted low income communities in Darwin, in partnership with local agency Consortium members: Melaleuca Refugee Centre (refugees and recently arrived migrants), Yilli Housing (Indigenous people in Bagot and Berrimah communities), COTA NT (seniors) and Carers NT (carers and care recipients). The project will deliver 480 home audits and a range of free and comprehensive home retrofits and products (in 2014-16) which are intended to reduce each home's reliance on energy for cooling. It is anticipated that the research data collected by Smart Cooling in partnership with Charles Darwin University, as well as the 19 other LIEEP projects around Australia, will directly impact on future federal government energy policies.

COOLmob has promoted sustainable tropical house design, via home audit advice, website, and technical publications[i].

Key in alleviating the more dangerous impacts of climate change is reducing society's energy consumption. COOLmob works to reduce the consumption of energy in homes, offices and schools. COOLmob also works with industry to promote the public uptake of energy and other resource efficient products and services.

COOLmob has assisted hundreds of Darwin households to install solar PV or solar hot water on their roof (through special offers and bulk buy initiatives with local businesses), and is now exploring ways to assist people to invest in or donate to public (community) solar projects, to increase the contribution to the NT's energy generation through renewable forms of energy.

COOLmob's work towards resource efficient homes, products and design leads to our contribution to a more sustainable urban design, where urban centres (cities, the CBD, suburbs and satellite towns) are planned and built according to sustainability principles.

The program has positive environmental impacts but also positive social impacts including community development, community engagement, an improvement in connectedness and reduction of social isolation – all of which contribute to a more sustainable society, anywhere.

ECNT is working on developing closer ties with educational institutions, community groups and industry groups to build on its COOLmob program.

A note on the Terms of Reference for this Inquiry

The following recommendations assume a business-as-usual scenario without further incentives in place for renewable energy sources.

However, ECNT notes that a business-as-usual scenario will not provide the level of incentive needed to produce deep cuts in greenhouse gas emissions for the Territory to significantly reduce its climate impact, particularly given that less than 1% of our electricity currently comes from renewables.

Impacts of climate change on the Northern Territory under a business-as-usual scenario[ii]

- In Darwin the number of hot days each year (over 35 degrees Celsius) is expected to increase from 11 to up to 69 by 2030 and up to 308 by 2070 without global action to reduce emissions, affecting levels of human comfort. It is predicted that without mitigation there may be as many as 407 temperature-related deaths in the NT by 2100 compared to 61 in a world with no human induced climate change. In Alice Springs, the number of hot days each year is expected to more than double from 90 to up to 182 by 2070 under business as usual.
- May be an increase in the proportion of tropical cyclones in the more intense categories, with a decrease in the total number of cyclones.
- Under moderately warmer and wetter climate conditions there may be an increase in the prevalence of some mosquito-borne diseases, as well as food and water-borne diseases.

- Sea level rise and potentially greater storm surges which will impact on coastal settlements, infrastructure and ecosystems. Since the 1990s northern Australia has experienced increases in sea level of up to 7.1 mm per year as the rate of sea level rise increases.
- The lowland parts of Kakadu are vulnerable to changed salinity as a result of sea level rise and saline intrusion into groundwater. Sea level around Kakadu will rise by at least 8 cm and by up to 30cm by 2030.
- Fundamental changes in ecological function will place severe pressure on many species of both plants and animals.

Counting the costs of inaction on climate change

- $2.5 million to replace Mary River barrage to protect freshwater wetlands from saltwater intrusion (NT Budget 2014/15)
- Impacts on infrastructure are 'expected to be extreme' including major threats to port infrastructure on the NT coast.
- 260 to 370 residential buildings at risk of inundation from a sea level rise of 1.1 metres with a current value of between $100 million and $134 million.
- A 1.1 metre sea level rise will also put 2045 kilometres of the NT's roads ($1.8 billion) up to 24 commercial buildings ($500 million) and 32km of railways ($100 million) at risk.
- The NT had an estimated meat cattle population of around $1.7 million in 2009. Climate change could reduce beef production by 19.5 per cent by 2030 and by 33.2 per cent by 2050.
- Tourism is estimated to contribute around 10 per cent to the NT economy. In 2010, 1.3 million people visited the NT and spent over $1.4 billion. Some of the most visited iconic sites, such as the Kakadu National Park, are under threat from climate change.
- Australia's average temperatures have already increased 0.9 degrees Celcius since 1910.

Research by the Climate Institute and others[vii] shows that the Renewable Energy Target is critical to keeping the cost of renewable energy-generated electricity low.

ECNT also advocates for the following policy instruments to bring down the cost of renewable energy generated electricity further under future scenarios and provide further incentive to move toward clean energy:

1. Implement a Territory Renewable Energy Target to buffer potential investors against changes at the Federal level

Australia currently has a legislated 41,000 gigawatt-hour (GWh) Renewable Energy Target in place. A detailed report by Bloomberg New Energy Finance[iii] shows if left untouched, the Renewable Energy Target is expected to:

- Drive $35 billion of investment in clean energy by 2020
- Employ 25,000 workers each year in construction and operations
- Reduce emissions from power generation by 5%
- Prevent future surges in power prices by supplying electricity for 20-25 years with no ongoing fuel costs

The Prime Minister has unsuccessfully attempted to repeal or reduce[iv] the Renewable Energy Target despite economic reporting finding that it causes no net increase in power for consumers beyond 2020[v] and reports from the Solar Council and others showing that repealing the RET would cut 15,000 to 20,000 jobs in the sector and stymie development by preventing investment.

Based on independent modelling by Jacobs, a recent report[vi] by the Climate Institute, Australian Conservation Foundation and WWF-Australia finds that **reduction of the large-scale renewable energy target** as proposed by some power companies has the following impacts:

- $8 billion additional profit to coal and $2 billion to gas generators (net present value of future profits 2015-2030).This includes $2 billion in extra profit for EnergyAustralia, $1.5 billion for Origin and $1 billion for AGL.
- **No decline in electricity prices**: in fact, they could increase slightly (an average $30 increase to the annual household power bill, with most of this increase taking place after 2020). This is consistent with modelling commissioned by the Government and studies conducted independently by leading economic analysts.
- Additional carbon pollution of about 150 million tonnes to 2030 (equivalent to adding nearly 4 million cars to the road) with additional pollution costs of over $14 billion.
- Loss of $8 billion in investment in new renewable capacity, with New South Wales and South Australia each standing to lose over $2 billion in foregone investment.

2. Implement an integrated climate change policy at the Territory level, with input into all future planning and development, with a clear target of zero emissions by 2050.

This should address both climate change mitigation and adaptation strategies as well as clear targets until 2050 and fully incorporated into:

- The Darwin Regional Land Use Plan
- Planning and Development
- Energy policies
- Natural Resource Management
- Conservation planning
- Public Health policies
- Northern Development and other policy agendas
- Other relevant policies

3. Put a price on greenhouse gas emissions through an Australian emissions trading scheme

Recent analysis by Climate Action Tracker states that all governments will have to significantly increase their action on climate change – both before 2020 and after, reducing total global greenhouse gas emissions to zero between 2060 and 2080, to keep warming to 2˚C[vii].

At the recent Bonn Climate Change Conference, both the US and China committed to taking action on climate change, with the US proposing a 30% cut in its power emissions by 2030 and China committing to a cap on its total greenhouse gas emissions.

Australia is committed to an unconditional target of 5 per cent below 2000 levels by 2020, requiring a reduction in emissions by 131 Mt CO2-e in 2020. However, Australia's emissions continue to increase and are likely to increase further since the Federal Government's removal of a price on carbon[viii].

Environment Victoria highlights:

> *The coal, oil and gas sectors get special treatment under Australia's tax system allowing them to depreciate their assets like drilling rigs and pipelines over a much shorter period than they are actually in use. Detailed analysis by the Australian Conservation Foundation found that this legal tax dodge for big oil, gas and coal projects is costing the rest of us billions, and it's growing.*
>
> *Thanks to the Paid to Pollute campaign, the Federal Government reduced this loophole at the budget in May 2013, saving Australian taxpayers $1.1 billion over the next four years, but there is still another $1 billion being lost to big polluters.*

Any tax incentive to the energy sector must promote clean and renewable forms of energy, such as solar, rather than dirty, costly and polluting forms of energy such as fossil fuels, to compensate for the environmental and health benefits generated.

Recommendations to the Committee

a) The advantages and disadvantages of different electricity tariff designs

The flat rate tariff currently applied across the Northern Territory to residential consumers does not discourage customers from using high amounts of energy or from consuming high amounts of electricity at peak times.

The ECNT advocates for a revised tariff cost structure which encourages high usage customers to minimize consumption generally and/or at peak times, as well as investment in new infrastructure that does target these consumers, with the following objectives:

1. **Reducing overall power consumption.**
2. **Avoiding capital investment into more gas turbine capacity to cover peak demand.**
3. **Significantly decreasing greenhouse gas emissions caused by burning fossil fuels to generate electricity.**
4. **Keeping the costs reasonable for both low and average use consumers.**
5. **Introducing new 'smart' technology to create the Grid that is more capable of applying time-of-use tariffs, as well as better demand response.**
6. **Introducing a tariff design, and infrastructure that allows more renewable energy integration into the grid.**

Ultimately one of the best ways to target the high consumption and peak demand users is to introduce 'Smart Meters', and 'Smart Grid' to better manage the grid as an entire system. There are myriad advantages which would accompany the implementation of a Smart Grid, besides being able to target tariffs at peak times. These include; better demand management, better integration of renewable energy capacity and the possibility of leveraging off new technology such as the AS 4755 standard, now required for all new air conditioners.

This has been proposed in the Power and Water Corporation Network Management Plan 2012/13[ix] to 2017/18, s5.2.4.2. Trials have been conducted as part of the Solar Cities project in Alice Springs, under s5.2.3.1. The ECNT advocates for a more rapid adoption of this smart technology, after field trials in NT conditions, appropriate research, and investigation of successes and failures in other jurisdictions has been undertaken.

We also advocate for the establishment of an expert panel to design and scope out the most appropriate technology and its roll out to consumers, supported by significant investments in research to achieve the objectives listed above.

In the meantime, the implementation of an Inclined Block Tariff (IBT) would be a mechanism for addressing high use consumers, with some assumption (requiring further investigation) that these are also high users in peak times. Smart Meters, and a time-of-use tariff could begin their penetration into the market by being applied on a user pays, opt in basis for high use consumers who feel they are being unfairly disadvantaged by the IBT, and who are capable of shifting their demand to off peak times. In this way Smart Meters begin penetrating the market where they are most needed.

b) Factors to be taken into consideration in the design and implementation of electricity tariffs

Public education and communication will be a vital element in the rollout of any new tariff systems and technologies. If the tariff is to be effective in facilitating behaviour change in both the rate and time of electricity consumption, education about both the nature and structure of the tariff, as well as the methods, mechanisms and technologies that need to be implemented need to be clearly communicated at the consumer level.

The risk is that many consumers will not adjust their usage and simply bear the increased cost. This could severely impact on the effectiveness of the tariff. The ECNT and COOLmob have more than ten years of experience and research capacity, in conjunction with Charles Darwin University, in communicating with and educating the public about energy literacy, and new energy saving devices.

Consideration and dispensation needs to be given to high use, low socioeconomic users (for example large family groups occupying a single dwelling). A recent report by Ernst and Young[x] found that 1 in 8 Australians cannot afford to pay their electricity bills. These customers need to be considered in the pricing structures. The ECNT in conjunction with COOLmob is currently implementing a project under the federal government's LIEEP (Low Income Energy Efficiency Program). This project will yield data, reports and solutions for both reducing the demand side for these low income consumers, as well as statistics on energy consumption and its relationship with lower income households.

c) Options for Feed-in-Tariffs for renewable electricity generation

Renewable energy, particularly solar PV, provides a perfect solution for taking the peak out of the demand, and reducing peak costs. In the current grid, with current infrastructure, solar PV could reasonably supply ~10% of overall demand. It is currently at ~1%. A feed-in-tariff should reflect this opportunity, and steps taken to ensure the grid of the future is capable of integrating more solar capacity.

Solar PV is becoming cheaper and more efficient. It can be scaled up as it produces electricity where it is most needed - spatially in the grid; at the point of demand.

The ECNT welcomes the NT Government recently announced rollout of large scale solar in the Daly River community of Nauiyu and the accompanying cloud forecasting and storage technologies being trialed. It also endorses greater support for the rollout of solar to other remote Indigenous communities under the Solar SETup program, although it would like to see more ambitious targets than a 15% diesel savings. It would like to see continued support for the Shoal Bay Landfill Methane Gas Generator (biogas) and the Uterne Solar Power Station in Alice Springs, as well as recognition of the benefit of Community Solar initiatives.

However, the NT Government must go further in its support for solar if it is to meet its global commitment to reduce its greenhouse gas emissions.

In 2013 ECNT hosted an expert workshop to consider the potential opportunity for exporting renewable energy generated electricity to Asia via a HVDC Connector, finding that it was worthy of further investigation. Please refer to the attached report 'Scoping workshop on Australia-South East Asia grid connection to catalyse regional generation and distribution of renewable energy'[xi].

The ECNT advocates the establishment of a stable floor price for domestic roof top solar feed-in tariffs. This needs to be set for a fixed period of time. Consumers will have both choice and security when they consider the purchase of a roof top solar system. They will know that they are guaranteed a return. Rooftop solar reduces peak demand, as the sun is often shining at peak usage times. The excess energy generated, at the current capacity of ~1%, helps reduce peak demand on the system. Renewable solar PV energy should be encouraged. The systems and technology required for a smooth transition into an environment where solar PV is producing more than 20% of the grid demand at peak times should begin to be instituted now.

A commercial feed-in-tariff shoud be reinstated as a mechanisms for increasing the uptake of renewable energy generation in the long term. Consideration should be given now to the infrastructure required for this to become a reality.

The introduction of a system that allowing some export into the grid at times of peak production for commercial producers, could help fill this gap in the medium term. It is likely that commercial producers will begin installing their own 'behind the meter' installations. The ability to trade some of this energy will encourage solar uptake in the shorter term, without negatively impacting the grid. This could be done of a per day basis, with no carry over, but would allow some flexibility and averaging of production

and consumption in industrial areas. These are the areas where there is high demand and an abundance of both roof space and the impetus for behind the meter installations.

Other recommendations to the Inquiry

1. Demand management is a key factor in maintaining a stable grid and reducing emissions from electricity. Little consideration is being given to the easy gains that may be made in lowering the demand side of the equation through energy efficiency and energy literacy, at both household and commercial levels. The inquiry should consider putting more resources and funding into energy efficiency and education campaigns to promote energy efficiency. It should also support research into the key drivers of energy behaviour such as thermal comfort. The ECNT and COOLmob have been working in this area in the Top End and the Centre for more than ten years and continue to conduct research and develop strategies under the LIEEP (Low Income Energy Efficiency Program).
2. Consideration should be given to effects of climate change on the network itself; (increased temperature, less reliable rain fall and more severe weather). Consider also the changing nature and timing of electricity demand driven by changing climate and weather patterns.
3. No consideration should be given to nuclear power generation for the NT, considering the risks involved, the scale and life cycle of such a facility, and the dangers associated with waste products. There are abundant, cheap and waste free renewable energy options available.
4. No consideration should be given to damming natural river systems for the purpose of electricity generation.
5. Consideration should be given to incentivizing some west-facing solar to supply renewables to combat peak demand, in the later part of the day. West-facing Solar has the potential to supply extra energy at this critical time, if orientated, priced and incentivized correctly.
6. Consideration of fast tracking the rollout of a smart grid and/or smart meters in order to better manage demand and the smooth integration of renewable energy at scale. Further investigation needs to be made in the most appropriate type of smart meter technology, with lessons taken from other jurisdictions.
7. Consider mechanisms and systems for taking advantage of new technology such as the AS 4755 demand management standard currently required for all new air conditioners. Investigate the prospect of its application to other high-use household appliances, such as pool pumps and EVs (Electric Vehicles) in the future.
8. Consider the impact, scale, and demand as well as possible advantages and disadvantages of a large scale uptake of EVs and EV changing stations on the grid.
9. Consideration of the implications and impacts of ‘behind the meter’ renewable energy installations at scale on the demand and peak demand on the grid, as well as the implications for networks and prices.
10. Consideration of the implications if consumers, en-masse begin opting for self-storage (batteries) for their roof top PV or other renewable energy sources. Consideration of what this means for grid that are patch worked with standalone systems, and what the reduced customer base will mean in terms of infrastructure. Energy networks need to adapt their models and

invest in technologies that allow consumers to participate in a central network platform or risk losing customers who can participate in the energy market independent of central network providers.

11. Consideration of how large scale, concentrating solar thermal generation plants with 'out of sunlight hours' capacity might be leveraged, bearing in mind the abundant solar resources in the NT. An ideal site would be located south of Katherine. ECNT recommends an investigation into the infrastructure needed to export this energy be considered in the near term. Costs for this technology are coming down, and options for storage are becoming more feasible, this option should figure in a long term plan.

Further Questions for the Committee

1. Is there a plan to have the Northern Territory participate under the same rules as the National Electricity Market (NEM), while remaining physically disconnected from it?
2. Is there any possibility of connecting to the NEM via a High Voltage Underground DC cable which could be installed as part of other major infrastructure projects?
3. How will PWC consider and manage limiting and passing on of costs to consumers for investment in metering technology.
4. How will the cost of smart meters be structure with the retail billing system?
5. Will it be a mandatory roll out?
6. How will renters access smart metering technology considering the split incentive?
7. How much funding has the NT Government invested in research and incentives to support better uptake of renewable energies in the Territory?
8. How is the NT Government's energy policy informed?
9. Will the NT Government consider implementing a Territory Renewable Energy Target, integrated climate change policy or supporting a price on greenhouse gas emissions?
10. What energy sources or technologies is the Committee investigating? How does it make this information available?

Contact

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[i] ECNT (2011) http://www.coolmob.org/sites/default/files/COOLmob_Design_Booklet.pdf
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[iii] Australian Solar Council (June 2014) http://solar.org.au/solar-progress/ret-and-rhetoric/
[iv] Clean Energy Council (2014) http://www.cleanenergycouncil.org.au/media-centre/media-releases/august-2014/140821-real-20-percent.html
[v] The Guardian (August 18, 2014) http://www.theguardian.com/environment/southern-crossroads/2014/aug/18/renewable-energy-target-abolish-abbott-hunt-warburton
[vi] Climate Institute (August 2014) Who really benefits from reducing the Renewable Energy Target? http://www.climateinstitute.org.au/www.climateinstitute.org.au/articles/media-releases/big-power-company-profits-the-real-outcome-of-any-changes-to-the-renewable-energy-target.html
[vii] Climate Action Tracker (June 2014) http://climateactiontracker.org/publications/briefing/155/Below-2C-or-1.5C-depends-on-rapid-action-from-both-Annex-I-and-non-Annex-I-countries.html
[viii] http://www.environment.gov.au/resource/australias-abatement-task-and-2013-emissions-projections
[ix] Power and Water Corporation (2014 - Revision) *Network Management Plan* 2012/13 to 2017/18
[x] Ernst and Young (2014) "Voice of the customer getting louder", *Customer experience series, Utilities* (Wave 3)
[xi] Blanch, S. Law, R. Campbell, A. Halawa, E. & Eiritz, C. (2013) Scoping Workshop on Australia-South East Asia grid connection to catalyse regional generation and distribution of renewable energy, 29-30 July 2013, Environment Centre NT & Centre for Renewable Energy, Charles Darwin University, Darwin.