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CEFC
CLEAN ENERGY FINANCE CORPORATION

Submission by the Clean Energy Finance Corporation to the Joint Select Committee into Northern Australia– March 2014

Content

1. About the CEFC

The CEFC was established in 2012 to address financing barriers and encourage private sector participation to support the transition of energy generation to cleaner technologies, distributed energy, and the adoption of energy efficiency. Significant innovation and adaption by the Australian finance sector is required to achieve this outcome. In pursuing this, the CEFC has stimulated co-financier's appetite and risk understanding, utilised financial aggregation, and attracted new investors to catalyse investment activity. In addition, the CEFC is helping investment in new areas, using specialist skills which are not readily available in the Australian market.

The CEFC has proven to be an effective government tool operating within the market to mobilise private sector skills, discipline and capital, to achieve a policy outcome. The CEFC and its co-financiers are proving successful in creating jobs, growing Australian businesses, and increasing the deployment of low carbon and renewable technologies.

We have developed a total portfolio of $590 million and with the contribution of $1.55 billion by our co-finance partners, have invested in projects worth over $2.3 billion in value. These CEFC investments are expected to earn an average yield of approximately 7 per cent and benefit industries across regional and rural Australia, including agribusiness, property, manufacturing and utilities.

2. Scope of the submission

This submission identifies potential opportunities for development in Northern Australia based on our experience financing low-emissions, renewable energy and energy efficiency projects. The submission draws on lessons learned and provides observations on how the CEFC could assist project proponents across a range of industries to promote further development in Northern Australia.

As the Terms of Reference are quite broad, our submission will focus only on policy areas in which the CEFC has prior experience or has the potential to contribute to in the future.

This includes the following points in the Terms of Reference:

Policies for developing the parts of Northern Australia which examine the potential for development of the region's mineral, energy, defence, agricultural and tourism industries.

In looking at each of these policy areas, the submission will address impediments to growth, opportunities for innovation and identify critical infrastructure needed.

3. Challenges facing the Northern Australian Energy Market

Population Distribution

The Australian Government's *Developing Northern Australia: A 2030 vision* defines Northern Australia as that area north of the Tropic of Capricorn. In that vast area of some three million square kilometres there are one million Australians.[1] The area falls within six Australian jurisdictions – the States of Queensland and Western Australia, the Northern Territory, the Cocos (Keeling) Islands Territory, the Territory of Christmas Island, and the Coral Sea Islands Territory.

[1] Robb, Andrew (2013) *Developing Northern Australia: A 2030 vision* [Coalition Policy Document].

In approximately 40% of Australia's land area there are just five cities with a population of more than 50,000 (see Table 1 below).

Table 1: Northern Australia - Cities of a population greater than 50,000 or more[2]	
Townsville, QLD	162,292
Cairns, QLD	133,911
Darwin, NT	106,255
Mackay, QLD	77,293
Rockhampton, QLD	73,681

The spatial arrangement of these cities is itself clustered (see Figure 1 below). Going from south to north up the Queensland coast, Rockhampton (1855, and through which the Tropic of Capricorn passes through), Mackay (1862), Townsville (1866) & Cairns (1876), were settled in that order, and are amongst the older settlements in that state from an era before roads. All four cities are linked by railway and the Bruce Highway with a number of smaller towns between them. Mount Isa is the largest inland town with an approximate population of 25,000. Another sizeable city - Gladstone, population approximately 35,000 is located just south of Rockhampton (and hence the Tropic).

Darwin (1869) in the Northern Territory is also an old port town but is located quite remote from other major settlements. The only other sizeable settlement in the Northern Territory is the inland city of Alice Springs (pop. approx. 25,000) which is again just south of the Tropic of Capricorn.

Western Australia has no comparable cities of this magnitude in Northern Australia, with the main candidates (Broome, Port Headland and Karratha-Dampier) each having in the order of 15,000 to 18,000 people each. Apart from mining and pastoral operations the interior is sparsely settled.

Figure 1: Spatial Location of Northern Australian Cities of More Than 50,000.

[2] Australian Bureau of Statistics 2011 Census QuickStats http://www.censusdata.abs.gov.au/census_services/getproduct/census/2011/quickstat/ Figures given are for Significant Urban Area (SUA).

Electricity Networks in Northern Australia

In summary:

- A large portion of the Queensland coast and hinterland up to Cairns and west to Mt Isa and the Gulf of Carpentaria is the only part connected to the National Electricity Market (NEM)
- The major towns of northwest Western Australia are connected by the Northwest Interconnected System
- Darwin and Katherine share a grid connection, while Alice Springs has an isolated local grid
- The remainder - a large part of Northern Australia is quite literally 'off the grid' – being supplied by remote generation.
- Much of the non-NEM generation is gas powered with liquid fuels (e.g. diesel generators) also playing a large role.

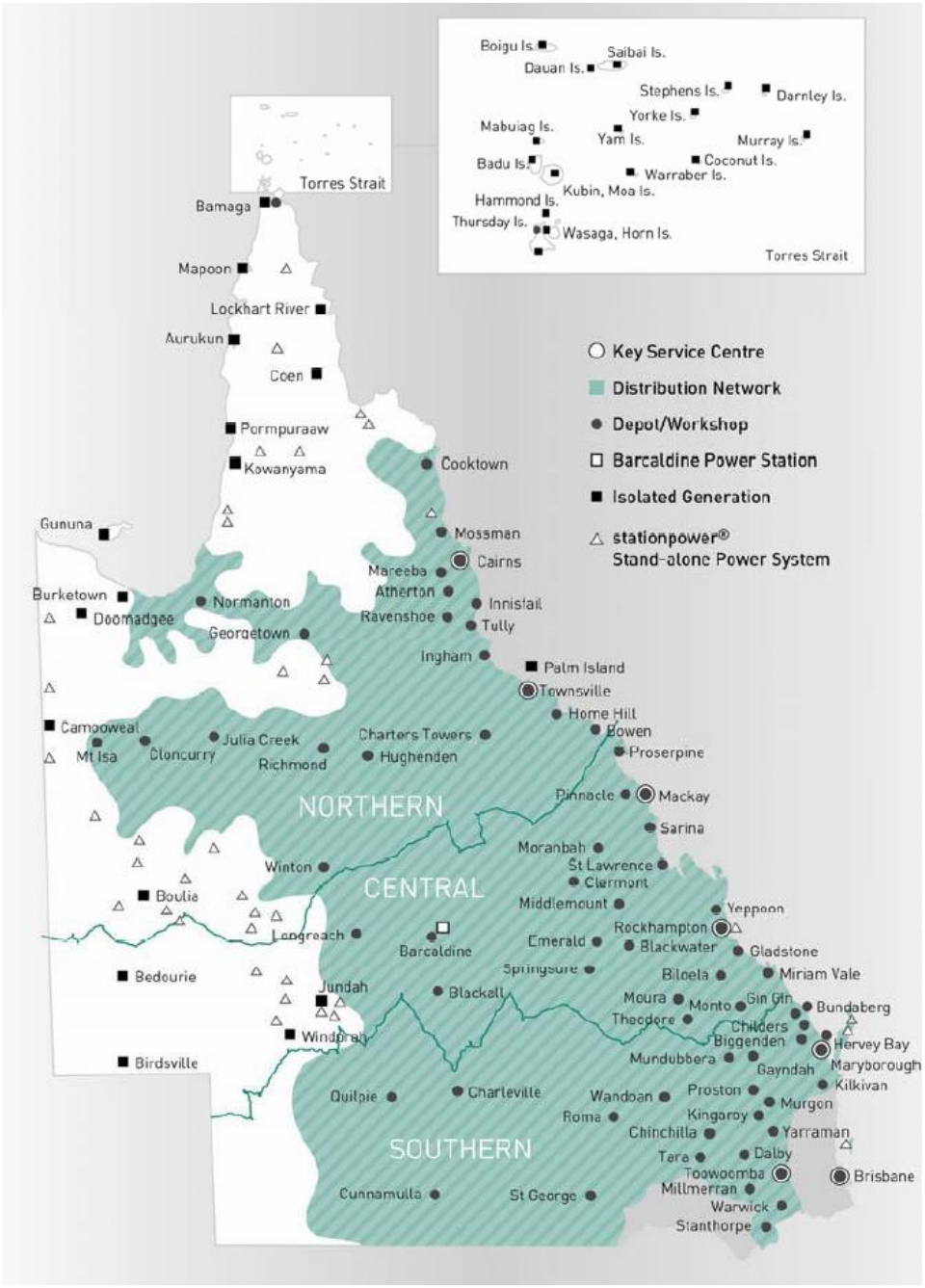
Queensland

The four Queensland cities north of the Tropic of Capricorn are on-grid, and a good part of the Queensland interior also has extensive transmission (Figure 2) and distribution coverage (Figure 3).

Figure 2: Major Transmission Lines – Queensland (in blue)[3]

[3] http://www.dews.qld.gov.au/__data/assets/pdf_file/0010/78544/irp-final-report.pdf at page 14

Figure 3: Queensland Grid Coverage (shaded green or grey)[4]



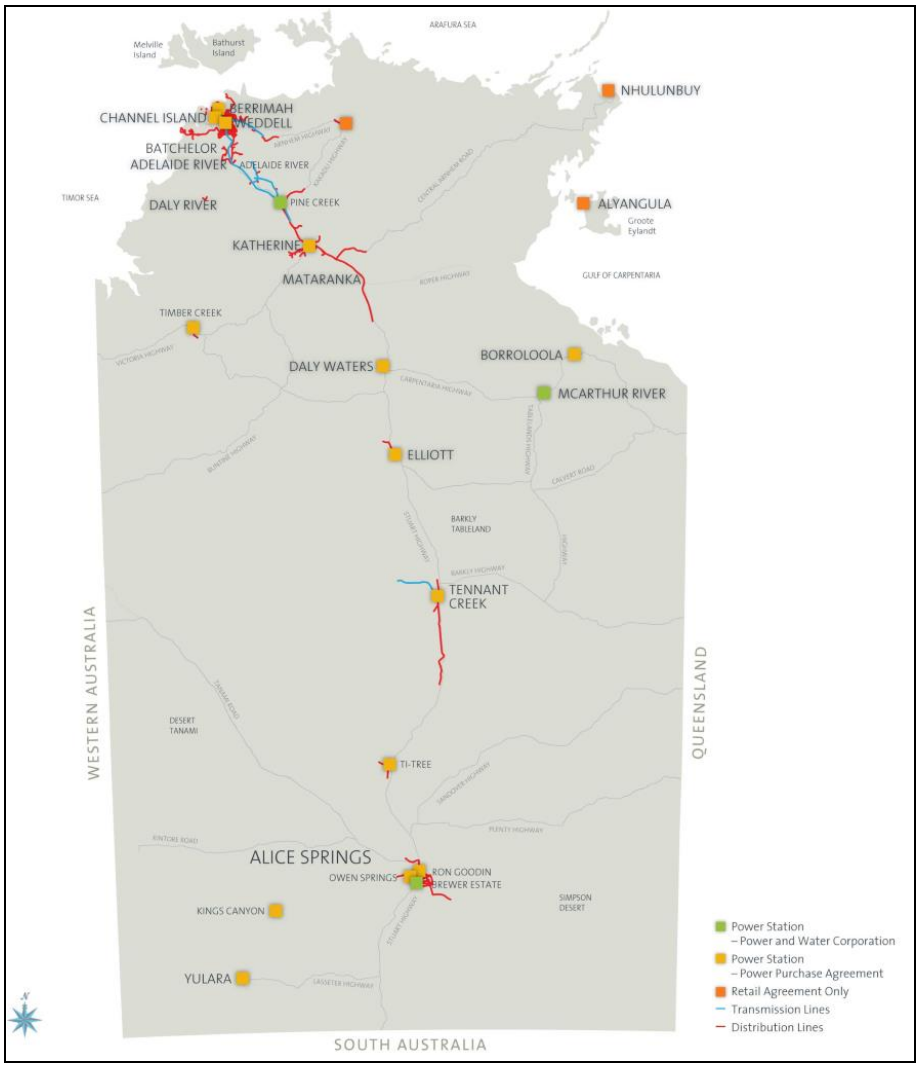
The area shaded green on the above map (Figure 3) represents the area serviced by one of the Queensland State Government's two distribution companies - Ergon. The blue transmission lines in Figure 2 and the Ergon area indicated by the green network coverage in Figure 3 are both connected to the National Electricity Market. The Tropic of Capricorn is not marked runs through Rockhampton to Longreach.

[4] http://www.dews.qld.gov.au/__data/assets/pdf_file/0010/78544/irp-final-report.pdf at p12.

Northern Territory

The Northern Territory electricity network is essentially Darwin and Katherine on the one grid, with distribution lines spidering out from minor isolated generation settlements along the main highway to Alice Springs. The Tropic of Capricorn is not marked but falls just north of Alice Springs. None of the generation networks are connected to the NEM.

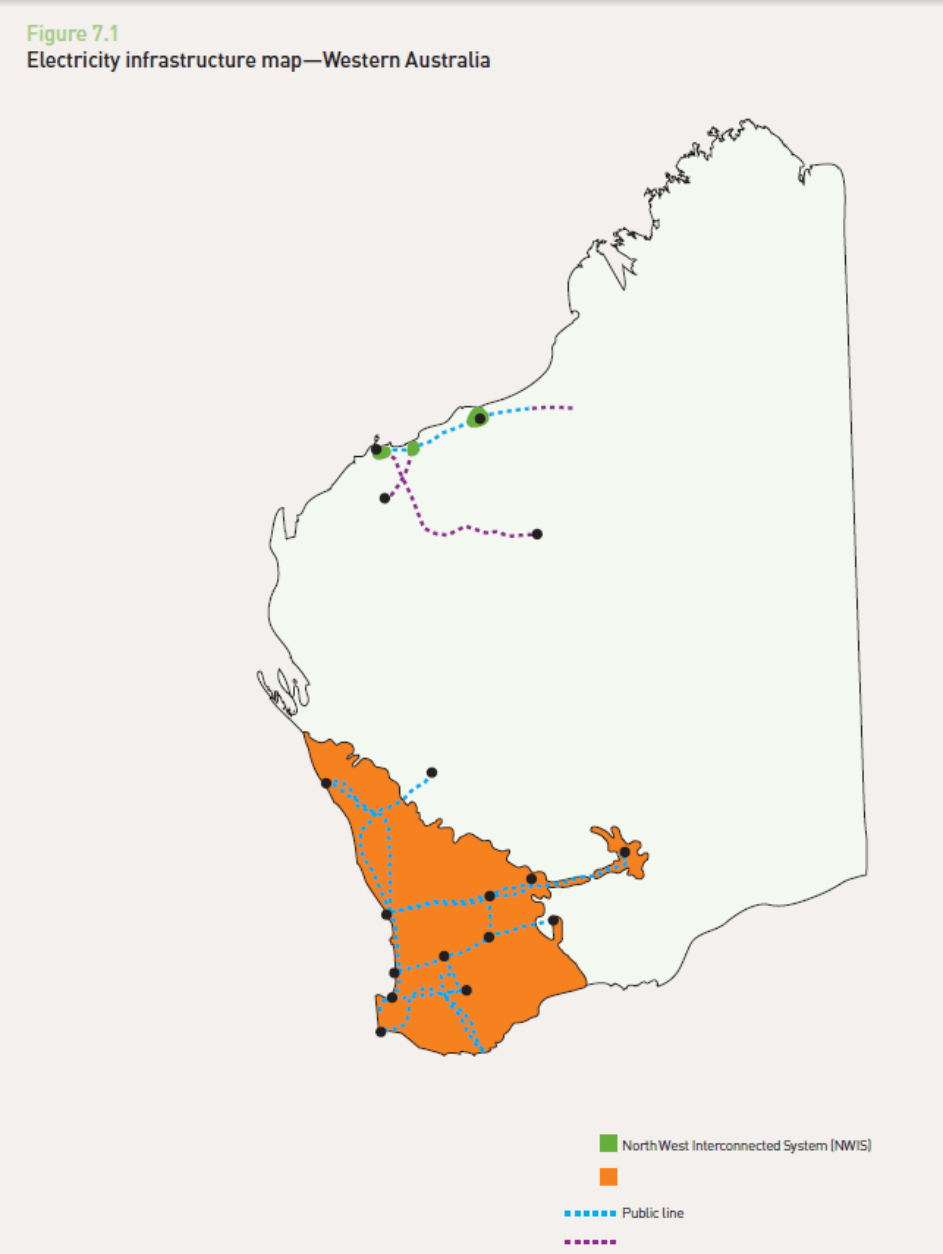
Figure 4: Electricity Transmission and Distribution in the Northern Territory



Western Australia

The North-West Interconnected System (NWIS) is a 400MW capacity network which has joined up private (i.e. mining sector) and public network infrastructure. The diagrams below illustrate the transmission lines and distribution coverage area of the NWIS. Note the area covered is isolated both from Western Australia's main grid and from the NEM, and includes the towns of Broome, Port Headland and Karratha-Dampier.

Figure 5: NWIS Transmission Lines[5]



[5] Commonwealth of Australia (2007) *State of the Energy Market 2007.* Melbourne: Australian Energy Regulator at p206.

Figure 6: *NWIS Grid Coverage*[6]

Gas Transmission and Distribution Networks in Northern Australia

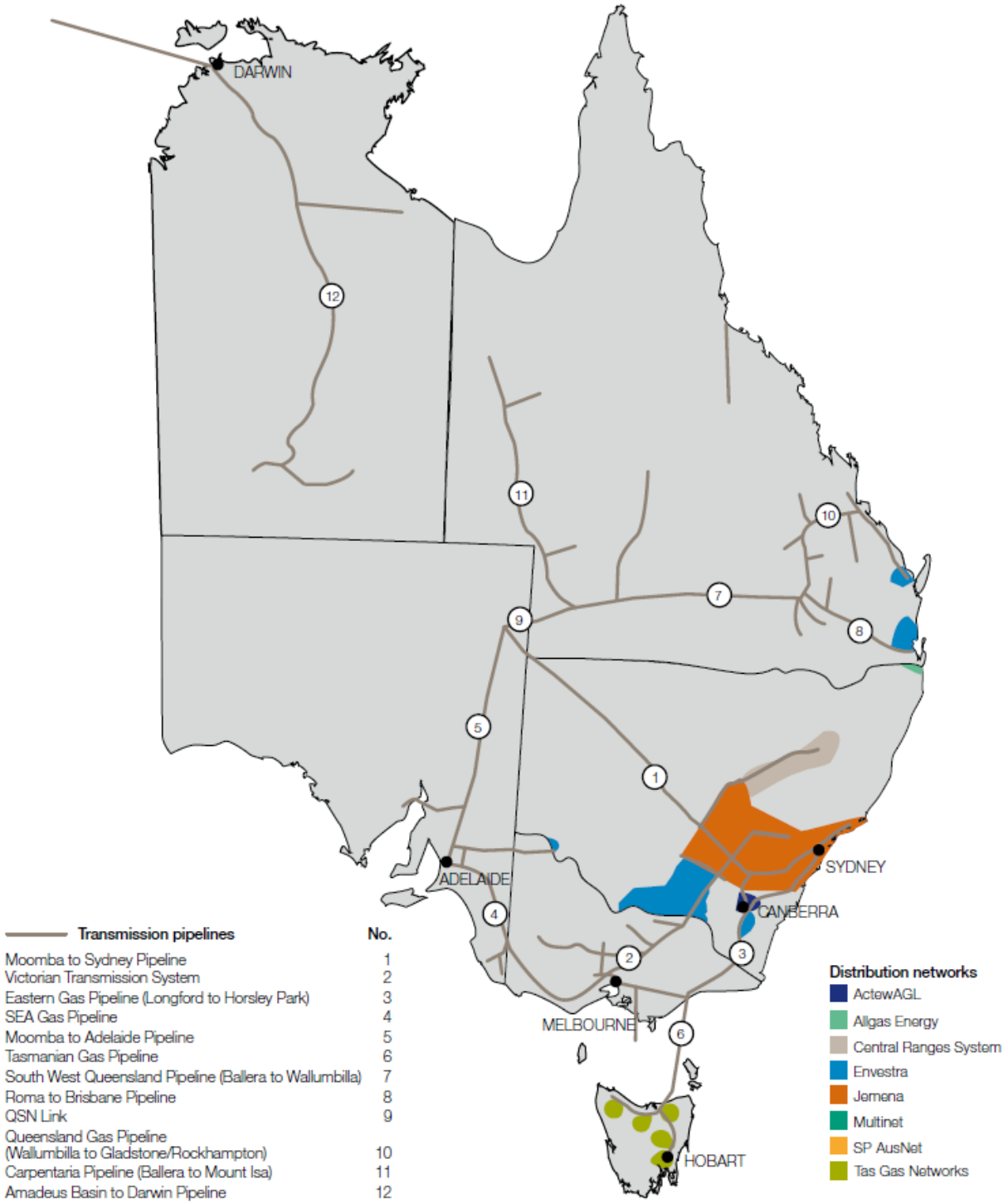
While gas pricing could tilt use of gas towards export rather than domestic use, the expense of generation off the NEM will likely preserve a role for gas fired generation in Northern Australia, particularly in relation to use of existing infrastructure.

Gas transmission in Northern Australia is largely geared towards export:

- In Queensland, the Queensland Gas Pipeline connects the cities of Gladstone and Rockhampton to the production site of Roma in Southern Queensland. A second pipeline connects Moranbah to Townsville, and a third connects the production site of Ballera in Queensland's southwest corner with Mount Isa in the northwest.[7]
- In the Northern Territory, a gas pipeline links the Amadeus fields near Alice Springs with that city, Katherine and Darwin.[8] A map showing major Queensland and NT gas transmission is at Figure 6.
- In WA, an extensive gas pipeline network exists connecting the oilfields of the northwest shelf, and inland gas fields with bulk ports around the WA Coast (Figure 7).

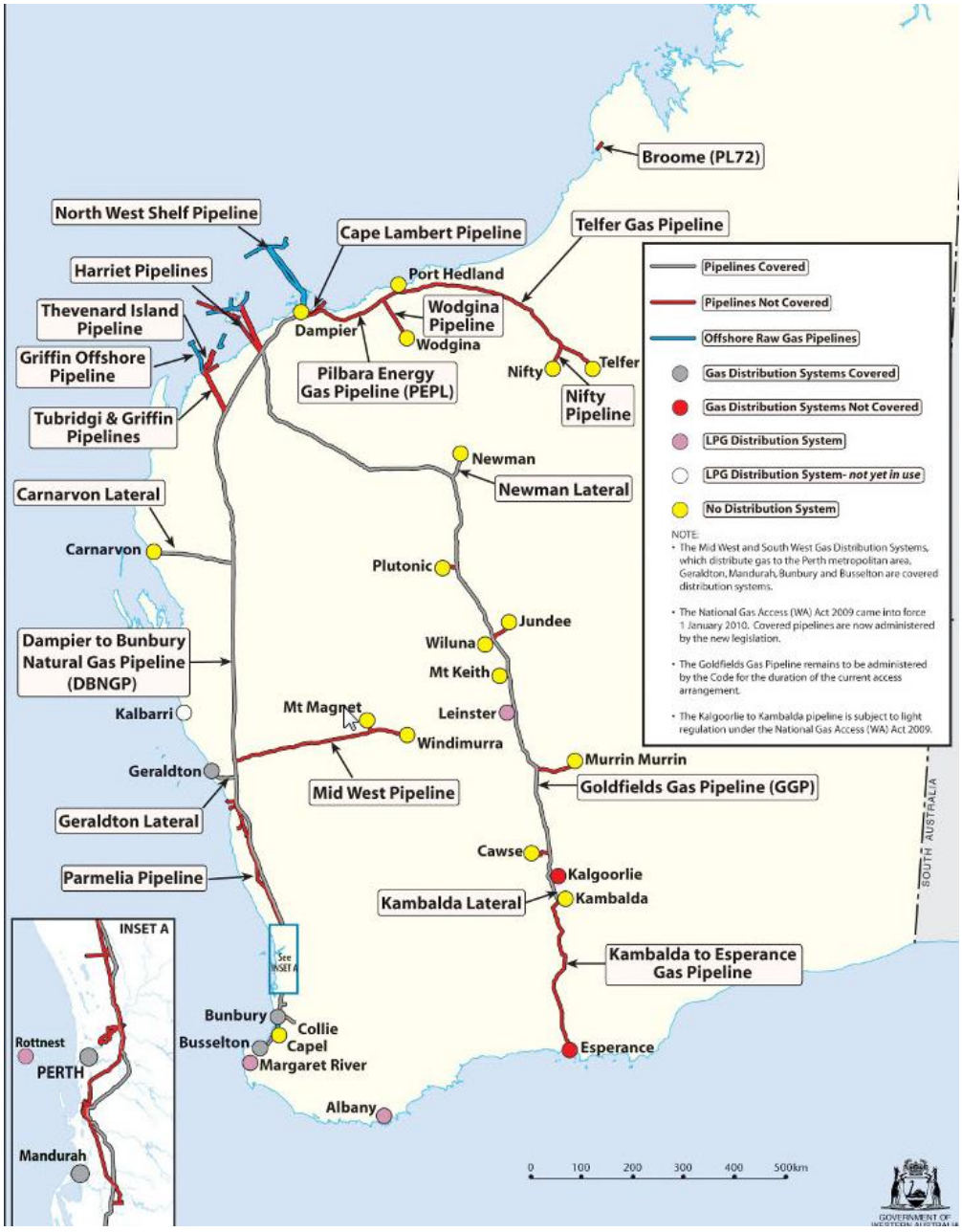
[6] http://www.energyaction.com.au/wa-electricity.html
[7] http://www.business.qld.gov.au/industry/energy/gas/gas-queensland/gas-transmission-distribution
[8] http://www.nt.gov.au/d/Minerals_Energy/index.cfm?header=Pipelines, http://www.aer.gov.au/sites/default/files/Chapter%204%20-%20Gas%20pipelines%20A4.pdf

Figure 6: Gas Transmission in the NEM (including Northern Territory and Qld)[9]



[9] http://www.aer.gov.au/sites/default/files/Chapter%204%20-%20Gas%20pipelines%20A4.pdf

Figure 7: Gas Transmission in WA[10]



Gas distribution in Northern Australia is limited to Darwin, Alice Springs, Rockhampton and Gladstone and the coal mining town of Moura.[11]

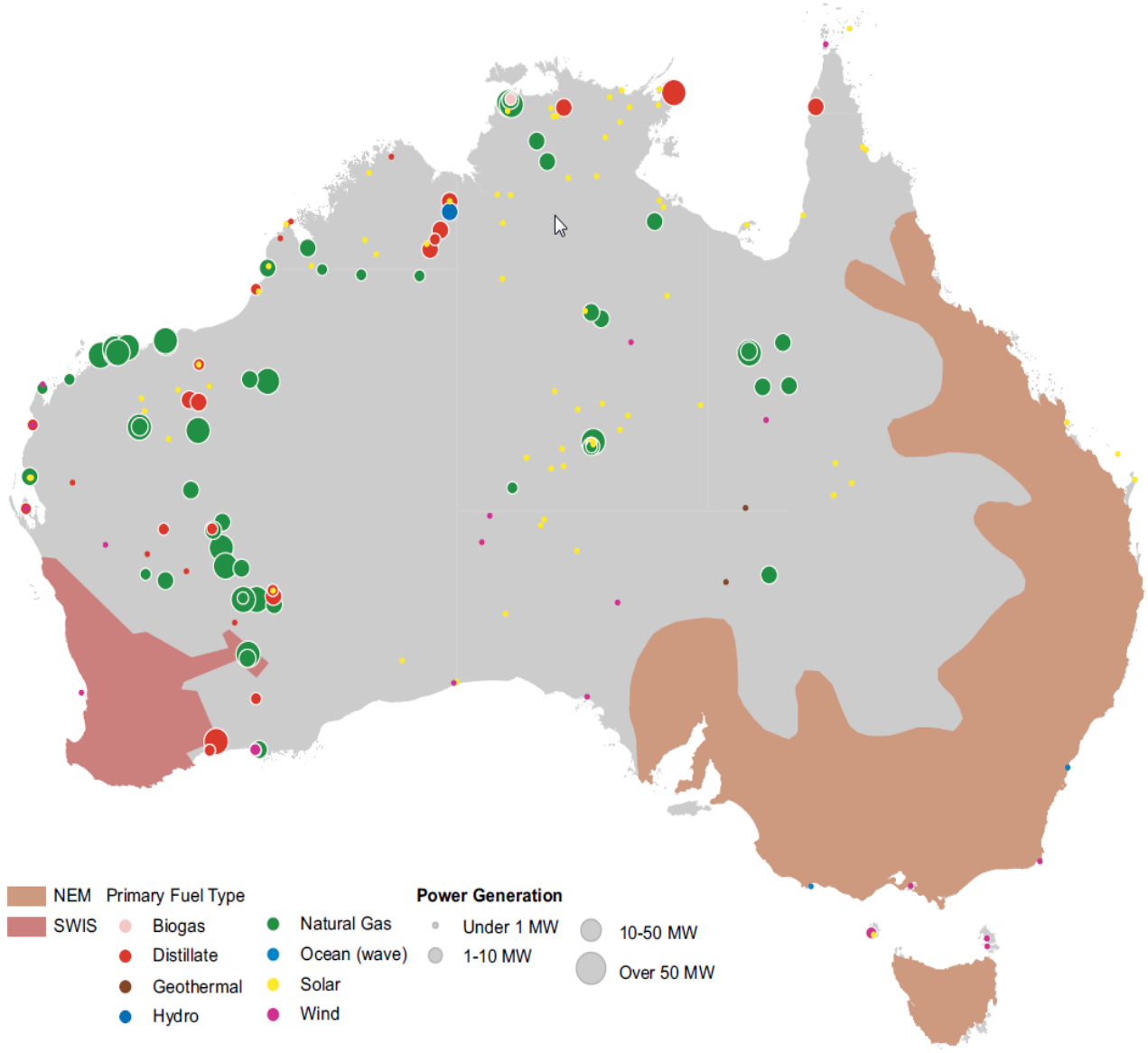
[10] http://www.erawa.com.au/infrastructure-access/gas-access/pipeline-infrastructure-map

[11] http://www.business.qld.gov.au/industry/energy/gas/gas-queensland/gas-transmission-distribution; http://www.engineersaustralia.org.au/sites/default/files/shado/Infrastructure%20Report%20Cards/Northern/part4_energy.pdf

Remote Generation

Remote sites tend to generate locally, because it may be uneconomic to supply them otherwise. As can be seen in Figure 8 below, the main fuel source is natural gas or distillate (e.g. diesel), but solar is playing an increasingly large role.

Figure 8: Remote generation[12]



Energy Challenges in Northern Australia

Broadly speaking, Northern Australia faces four electricity challenges:

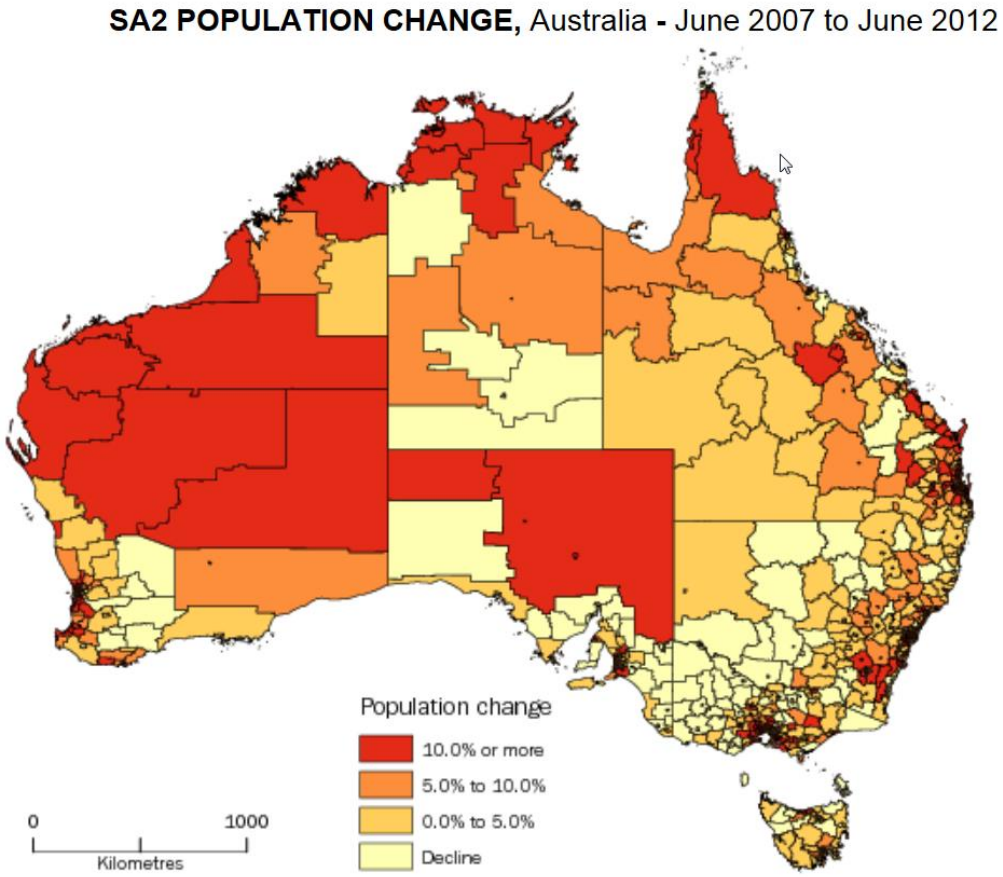
- Population growth in most areas
- Network build out in concentrated population centres

[12] Australian Remote Renewables: Opportunities for Investment

- Costs of network servicing and transmission losses across large distances
- Generation capacity limits for greenfields development and remote area servicing.

While starting from a low base, many localities in Northern Australia are experiencing rapid population growth, as the diagram below shows (the approximate alignment of the Tropic of Capricorn has been added for illustrative purposes).

Figure 8: Population Change in Northern Australia 2007- 2012.[13]



As can be seen from Figure 8 much of what constitutes Northern Australia is experiencing above trend growth. The challenge of providing energy infrastructure in this environment is complex:

- Much of the non-NEM grid area of Northern Australia is remote from coal, but relatively near to major gas transmission
- The effect of price linkage of the domestic gas market to the export market may raise the price of gas generation in the future
- Currency fluctuations will also impact on an export-linked gas market in the same way that it impacts on oil and petroleum markets
- Electricity transmission over long distances and to sparsely populated areas is expensive
- Rising electricity costs are placing continued network expansion under pressure

[13] Australian Bureau of Statistics (2012) *3218.0 - Regional Population Growth, Australia, 2012* at http://www.abs.gov.au/ausstats/abs@.nsf/Products/3218.0~2012~Main+Features~Main+Features?OpenDocument .

4. Portfolio of CEFC Projects in Northern Australia

The CEFC already has on-the-ground experience working on two significant energy-related projects in Northern Australia which offer beneficial case-studies of opportunities which are scaleable and replicable by the CEFC in other locations in Northern Australia.

The first project was the co-finance (with National Australian Bank) of a solar installation for Australia's largest beef cattle producer, the Australian Agricultural Company (AACo). AACo is a world leading provider of beef and agricultural products and its farm sites cover more than 7.2 million hectares across Queensland and Northern Territory.

This finance enabled photo-voltaic systems to be installed across 15 grid-connected sites in Queensland. A number of these installations are in North Australia, including: at four stations in or near Julia creek, at a station in Normanton and a number of installations in Comet. Systems range from 2 kilowatts to 99 kilowatts. These systems have enabled AACo to cut their grid energy consumption by nearly 30 per cent.

The second project that the CEFC has provided finance for is Energy Developments Limited's (EDL) expansion of the Moranbah North power station in North Queensland. The station generates power from waste coal mine gas which is a reliable source of base-load power that can be used to substitute for coal-fired power. The expansion will reduce greenhouse gas emissions of about 500,000 tonnes of CO2-e per annum.

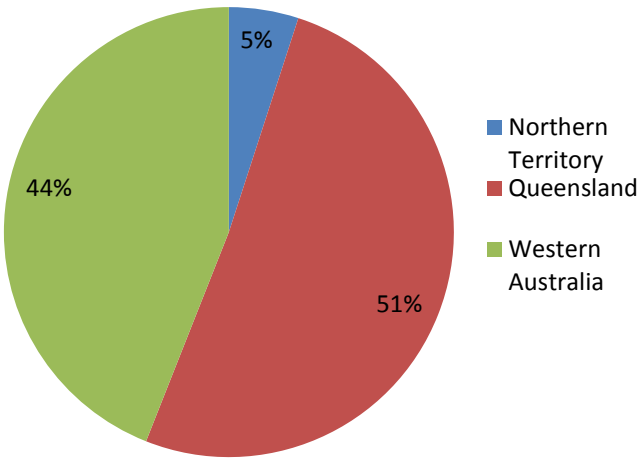
The power station's capacity to generate low emissions energy is being increased from 45 to 63 megawatts, increasing its abatement of CO2-e by 40%. The expansion is being funded using CEFC's senior secured corporate loan to EDL of $75 million. This facility will be used for other projects that capture landfill gas, waste coal mine gas or mine vent air methane and use these gases to generate electricity, as well as for remote hybrid renewables projects.

5. Pipeline of CEFC Projects in Northern Australia

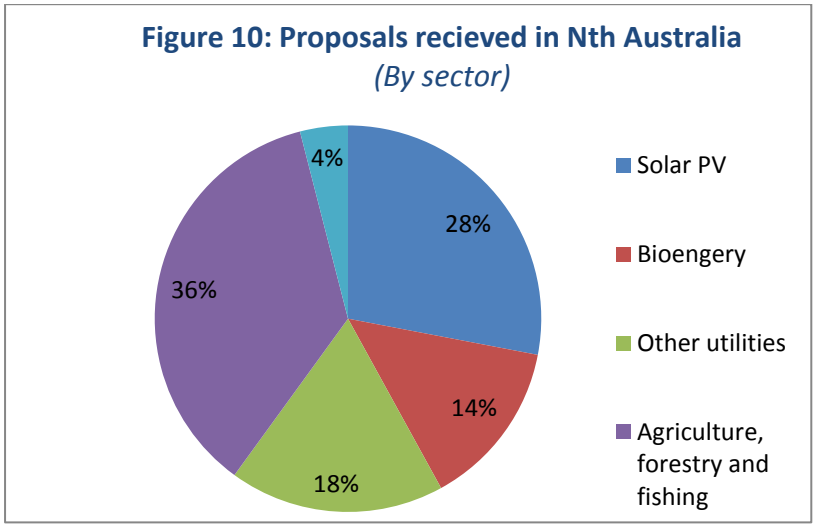
In addition to projects already underway in Northern Australia, the Clean Energy Finance Corporation has received over 20 proposals across Northern Australia spread across Queensland, Western Australia and the Northern Territory.

Figure 9: Northern Australia Pipeline

Proposals recieved by state



These proposals relate to projects totalling almost $1.5 billion, seeking CEFC funding of over $440 million. Most of these proposals are for projects that will help meet demand for low-emissions and clean energy in Northern Australia.



6. Potential opportunities for development in Northern Australia using clean technology

a. Potential for Development of the Region's Energy Resources

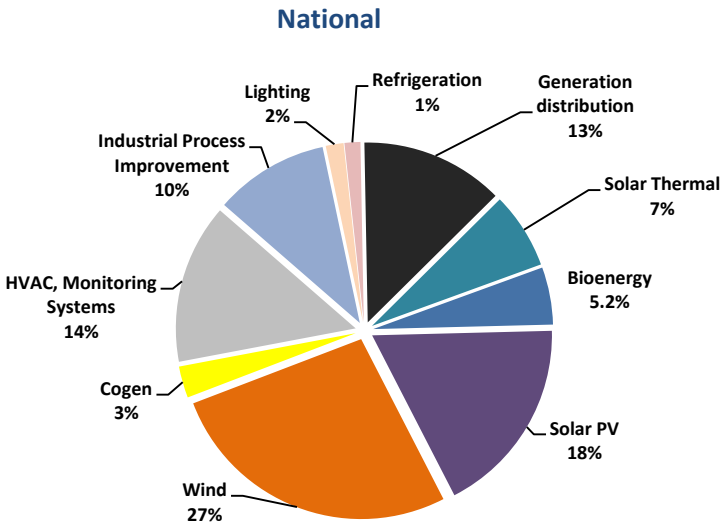
Whilst there are challenges in providing reliable, clean, inexpensive energy to meet the growing demand in Northern Australia, there are also a range of opportunities.

Renewables

As the Government identified in its then election policy document,[14] there is an abundance of well-located sites for clean energy generation technology such wind, solar and hydro. The CEFC agrees that Northern Australia could 'serve as a clean energy provider to meet domestic and internationals needs'.[15] The CEFC already has experience in financing small and large-scale renewable energy projects including solar thermal, bioenergy, solar photovoltaic and wind projects across Australia. In addition, 64 per cent of the pipeline of proposals the CEFC has received in Northern Australia are for solar and bioenergy projects.

[14] Robb, Andrew (2013) *Developing Northern Australia: A 2030 vision* [Coalition Policy Document] at p37.
[15] Ibid p16.

Figure 11 Current Portfolio of CEFC projects



Northern Australia is also well placed to capitalise on opportunities in biomass and biogas, for example ethanol form sugar cane and energy from cane bagasse. Mackay Sugar is a good example of how these types of projects can cut company costs and provide a reliable source of energy for the local community. The CEFC is already providing financing for a number of agribusinesses to turn waste from their agricultural processes into energy (discussed further below in Section 6c on Agriculture).

DISTRICT COOLING WITH STORAGE IN THE NORTHERN AUSTRALIAN CONTEXT

District cooling with storage offers significant potential for energy cost savings for cities in Northern Australia. District cooling involves the construction of centralised cool water storage facilities and cooled water piping to deliver this cooled water to buildings. It removes the requirement for chiller equipment and air conditions at each connected building and reduces total energy consumption and associated greenhouse gases.

By cooling water overnight during low electricity demand times, it also presents an opportunity for peak demand management.

These offer significant opportunities for cities in warmer climatic zones. Some key Australian examples of precinct cooling projects with storage are operating at James Cook University (JCU) Townsville and Cairns campuses, Brisbane Airport and Southbank Institute of Technology Southbank campus. The JCU Campus District Cooling Systems at Cairns and Townsville deliver chilled water to buildings to provide more efficient air-conditioning, the area of JCU's energy usage which was previously consuming up to 60% of total usage. The Campus District Cooling Systems reduce daytime peak electricity usage by 40%. The JCU Townsville Campus has reduced energy consumption by 25%, reduced carbon emissions by 10,600 tonnes per annum and resulted in a peak demand reduction of 40%, saving JCU over $2 million per annum compared to business as usual.

In many offshore countries such as Saudi Arabia, United States or Europe, district chilling or heating are commonplace. Yet in Australia, there has been limited take up.

Benefits of District Cooling:

In addition to significant energy and maintenance cost savings over air cooled equipment, building owners benefit by reduced capital costs and removal of the onus to operate and accommodate chilled water cooling plants within their building space.

Electricity Distributor Benefits:

The benefits include control over large electrical load allowing load shifting, efficiency improvements in managing distribution assets during peak and low load periods and associated reductions or deferrals of capital expenditure to meet growth in demand.

Benefits to the Community:

The community benefits from greenhouse gas emissions, reductions in quantity of ozone depleting refrigerant gas and reduction in ambient noise levels.

Peak demand management as a benefit of district cooling with storage:

Across Australian electricity distribution networks, typically 10% to 15% of the infrastructure and assets are used for a very limited time. For example, of Energex's $8.8bn distribution network, about 13% of this infrastructure is used for 100 hours a year. That is $1bn of investment was required to address the peak demand totalling 4 days a year. Australia wide electricity demand increases are driving $40bn investment in distribution assets over the next 5 years.

Climate control is a major driver for demand growth. Ergon's forecasts transmission and distribution savings of $3.36bn/ year by 2020 associated with Australia wide district cooling with storage.

Sources: Report for Ergon Energy, Estimation of the National Potential of District Cooling with Storage. In support of the Expression of Interest to the Australian Carbon Trust, August 2010, Wessex Consult.

Gas

Other opportunities exist in gas fired generation in the North which is comparatively cleaner than coal, and lends itself to opportunities in precinct co-generation and trigeneration. The CEFC has undertaken a number of co-generation and trigeneration projects in Victoria and New South Wales and could use that experience in financing similar projects in other parts of Northern Australia.

Fuel substitution

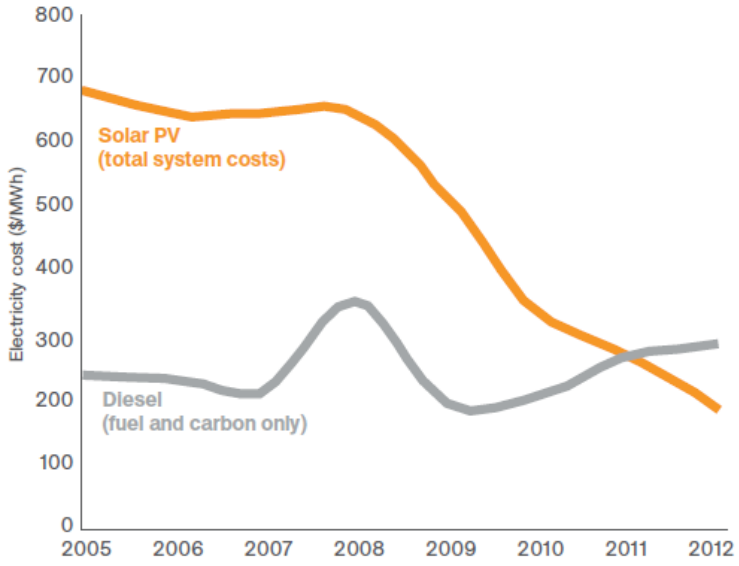
The North's large mining, bulk transport, commercial fishing, aviation and agribusiness footprint also lends itself to efficiency and cleaner fuel substitution opportunities, like LPG and ethanol, particularly given the sugar and gas supply in the region.

Energy efficiency

Within the five main cities in Northern Australia, there is legacy building stock, street lighting, large defence facilities (e.g. Lavarack Barracks Townsville, Darwin Airport) and industrial process opportunity in energy efficiency. Using the existing network more efficiently in the right areas can free up capacity for growth and reduce the need for network expansion or augmentation. The CEFC has substantial experience in this area and a wide range of financial products to assist local governments, not-for-profits and companies improve building and operational efficiency (discussed further below in Section 6d on Tourism).

As clean energy technology comes down the cost curve, it can become a cheaper alternative than some conventional fuels (e.g. solar vs diesel Figure 9 below). Combined with more affordable battery storage, it has great potential to help meet rural and remote Australia's energy needs.

Figure 12: Historical Cost comparison – solar vs diesel[16]



Source: AECOM

b. Potential for Development of the Region's Mineral Resources

Coal-mining is prominent in Northern Australia, particularly in northern Queensland. However, coal mining releases methane gas trapped in coal seams. Waste Coal Mine Gas (WCMG) gas is a safety hazard and impediment in underground coal mines. It must be extracted by mine ventilation and coal seam drainage.

The Government's *2030 Vision for Northern Australia* states that opportunities for mining in the North could be significantly enhanced by new and innovative energy projects which could provide affordable new sources of base load power. This is something the CEFC is already working on. Rather than allowing harmful methane gases from coal-mining to escape into the atmosphere, they can instead be used as a fuel source for power stations, reducing reliance on coal-fired generation. This type of project is in operation in Northern Australia in the Moranbah North Coal mine (discussed in Section 4 on the CEFC Portfolio), using finance provided by the CEFC. There is potential for this type of project to be replicated at other coal mines in Northern Australia which has the triple-benefit of making mining more sustainable, providing a reliable source of energy and creating jobs.

LNG is increasingly being used as a transport fuel and for stand-alone remote energy users in China, Japan, Europe and the United States.

Replacing diesel for significantly less expensive LNG as a new energy source for Australia has the potential to reduce costs for heavy diesel fuel users, unlock investment in the economy where projects may be marginal, improve the competitiveness of exporting industries reliant on diesel as their primary energy source and reduce energy costs, especially in regional and remote parts of the country. LNG production could be used to supply the resources and transportation sectors to replace the use of diesel fuel with LNG systems especially designed for mining machinery, mine haulage vehicles, heavy haulage vehicles, locomotives, the marine and the shipping sectors.

[16] Australian Remote Renewables: Opportunities for Investment

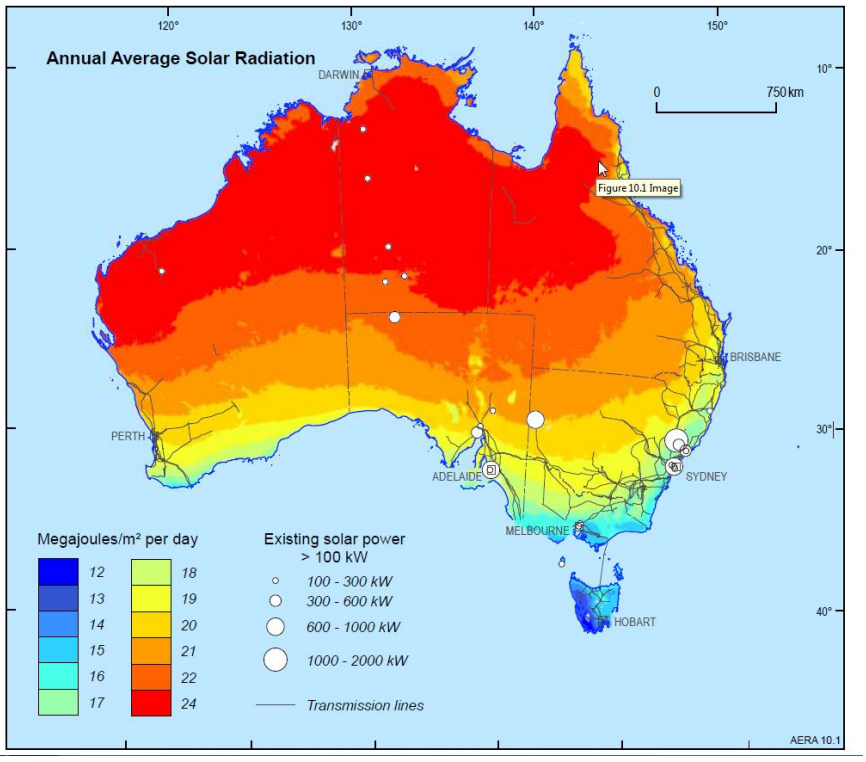
c. Potential for Development in the Agricultural Sector

The Government has referred to increasing agricultural output in Northern Australia as a key priority in its *2030 Vision for Developing Northern Australia*. Through our current portfolio, the CEFC is already helping to increase output, innovation and productivity in the agricultural sector. Of most significance is the fact that most of these projects are reducing energy bills for farmers. According to the National Irrigators Council, rising electricity bills are one of the major impediments to competiveness and productivity faced by farmers.

The CEFC has financed four technologies that exemplify the potential of energy efficiency and renewable energy to support the development of Northern Australian agriculture. Some of these projects are already occurring in Northern Australia, whilst others could easily be replicated or adapted for the North Australian environment.

The first technology is commercial-scale solar (as mentioned in Section 4 on Portfolio) for agricultural producers to help reduce their reliance on on-grid electricity consumption and cut energy bills. This type of project could be replicated across almost any type of agricultural operation in Northern Australia and given the high solar radiation in Northern Australia (Figure 10) there is significant potential for commercial-scale solar to increase efficiency and lower costs in the agricultural sector.

Figure 13: Annual Average Solar Radiation[17]



The second type of technology is bio-waste-to-energy technology, which is being applied in the meat and dairy industry. This type of technology enables agribusinesses to cut electricity bills by 30-60 per cent and cut waste disposal costs, improving profit margins

[17] Bureau of Meteorology, 2009, Average Daily Solar Exposure, <http://www.bom.gov.au>

and providing a valuable source of on-site electricity generation. Under a new agreement by CEFC with Quantum power, for up to $40 million investment, even more agribusinesses will be able to install waste-to-energy technology, including in Northern Australia. This type of technology can be applied in any intensive livestock operations, abattoirs or dairies in Northern Australia. Companies that have used finance provided by the CEFC to install this technology include AJ Bush & Sons', Darling Downs Fresh Eggs and JBS.

The third type of technology that can work to assist the agricultural sector, particularly in terms of increasing output, is exemplified in Sundrop Farms. The CEFC is providing $40 million for Sundrop Farms' application of solar thermal technology for a 20 hectare greenhouse complex in Port Augusta SA which will supply 15,000 tonnes of tomatoes annually to national markets. The technology harnesses solar energy to desalinate seawater for irrigation, to produce electricity to power the greenhouse and to provide energy to heat and cool the greenhouse. This type of project would also complement the Government's proposal to support the "advancement of meritorious proposals for water infrastructure across Northern Australia." It can provide substantial opportunities in terms of increased output in Northern Australia as the greenhouse can be located on land not normally considered suitable for agriculture, including on degraded land or in arid, semi-arid and tropical climates where water supply is intermittent.

Finally, the CEFC is also working with the agricultural sector to implement energy efficiency measures which will reduce costs. Two examples of this include: Australia's largest pork producer, Rivalea and a major Goulburn Valley supplier of apples and pears which have both upgraded their industrial refrigeration using finance from the CEFC and will cut energy costs as a result. These types of cost savings from energy efficiency measures can be applied to almost any agricultural operation helping to make companies more competitive and sustainable.

d. Potential for developing the Tourism sector

Northern Australia is a popular destination for domestic and international tourists attracting around 1.5 million international visitors per year. A key objective outlined in the Government's *2030 Vision for Developing Northern Australia* is to grow the tourist economy in North Australia.

In an environment where the tourism sector plays such an important economic role for the region, it is vitally important that tourism operators are driving cost efficiencies in their business processes to achieve competitive advantage. This is especially important given the high dollar which has made Australia a more expensive tourism destination over the past few years.

The Northern Australian tourism industry can realise significant cost savings potential by rolling out energy efficiency technologies in their commercial buildings which will assist in cutting energy costs and making accommodation more competitive and affordable.

The CEFC, and before them Low Carbon Australia, can point to a wealth of projects they have convened and invested in across the country that have assisted proponents increase energy efficiency levels in their commercial buildings and deliver resultant cost savings, including in the Tourism sector.

Energy Efficiency in Hotels

The CEFC/Low Carbon Australia investment as part of a $1.3 million energy efficiency upgrade to the multi-use 1960s high-rise CQ building at 123 Queen Street, Melbourne, has assisted in delivering energy cost savings greater than 50 per cent.

The CQ building at 123 Queen Street has enabled this hotel complex to half its energy costs which has freed up capital to use in other parts of the business.

The upgrade consisted of a trigeneration system to generate electricity, heating and cooling, as well as occupancy sensors and double glazing resulting in savings of around $180,000 per year.

Other upgrade benefits include an improvement to the overall value of the building, improved attractiveness for tenants and an improvement in its NABERS rating from 2.5 to targeting 4.

Companies operating commercial buildings in the Northern Australia tourism industry would be in a particularly good position to leverage cost savings from the adoption of energy efficiency technologies because the hot climate means hotels rely heavily on air-conditioners.

While the potential for businesses to achieve cost efficiencies through emissions reduction and energy efficiency within their commercial buildings is there, barriers to implementation remain for many project proponents. The CEFC observation is that due to a range of potential barriers including split incentives, company capability, motivation and project attractiveness, many of these measures remain unimplemented notwithstanding rising energy prices.

Products offered by the CEFC have proved successful in overcoming common barriers to energy efficiency activity by offering access to 'upfront' capital for a sufficient term to support the project, improving a project's payback rate and/or helping to overcome the split incentive issues common between building owners and tenants.

The types of products available include:

- **On-bill finance** – offered through a co-finance agreement with energy utility, Origin. This finance model assists proponents to cover the upfront cost of energy efficiency projects but differs from regular hire purchase arrangements in that the equipment financed usually provides energy and dollar savings which can wholly or partially offset the cost of paying the finance back through regular energy utility bills
- **Energy Efficiency Loan Program** – the CEFC is partnering with Commonwealth Bank to provide finance to this $100 million program for businesses to upgrade their equipment and processes. This includes: upgrades to lighting, building management systems and metering, heating ventilation and air-conditioning upgrades, cogeneration or trigeneration installation, and small-scale solar PV.
- **Environmental Upgrade Agreements** (**EUAs**) – The CEFC has partnered with NAB and ANZ in providing funds managed through Eureka Funds Management to assist proponents undertake energy efficiency upgrades involving air-conditioning systems, building management systems and lighting. These projects tie finance to a commercial property rather than its owner and enable repayments through

council rate notices. This structure allows longer payback periods, improving the attractiveness of undertaking energy efficiency upgrades.

Should the CEFC remain in operation, it could prove a worthwhile financing resource for Northern Australian tourism operators who are looking to improve the energy efficiency of their commercial buildings and henceforth drive down energy costs and free up capital for other areas of their business.

e. Potential in the local government sector

Local governments across northern Australia cover vast territories and have relatively smaller populations, limiting their rates base and their capacity to meet increasing costs of providing civic services and cover basic asset maintenance. As with councils elsewhere, this can be addressed by lowering their energy and operating costs through efficiency improvements and greater use of cost effective renewable energy:

- Street lighting upgrades to long-life efficient bulbs;
- Building upgrades to reduce operational costs for council owned facilities, including lighting, building monitoring systems, heating, ventilation and air conditioning (HVAC) systems, insulation, installation of solar panels, and other forms of building and equipment upgrades;
- Building and aquatic centre cogeneration and trigeneration; and
- Waste management systems upgrades including landfill gas management and waste to energy systems.

Projects financed by the CEFC for these sorts of investments have typically been able to reduce local government facilities' energy costs by around 50 percent. Street lighting is the single largest source of energy costs for the local government sector in Australia and it typically accounts for 30 to 60 per cent of carbon emissions.

Studies by experienced local government consultants Ironbark Sustainability have demonstrated how councils can save nearly 70 per cent in their street lighting energy costs by changing to widely accepted energy efficient technologies. Energy cost savings of 77 per cent are possible with LED lighting technology.

The CEFC is financing local councils with finance tailored to their needs, to upgrade street lights with more energy efficient technologies to reduce a major source of their operational costs and carbon emissions. Because street lighting is typically owned and operated by energy suppliers yet paid for by councils, upgrades can be a complex area to navigate. To address this, the CEFC has partnered with Commonwealth Bank to provide up to $100 million finance to council and not-for-profit organisations through the Energy Efficient Loan program.

Waste management is also a challenging area for councils. For example, a recent study undertaken by the Waste Authority of WA shows some 670,000 tonnes of solid waste generated in 2012 in the Pilbara and Broome region alone. This included some 148,000 tonnes in Port Hedland and 302,000 tonnes in Karratha. Waste to energy plants have the potential to offer local governments an economic efficient alternative to landfill and in fact generating revenue through distributed generation electricity into the grid.

These plants utilise energy from clean waste streams that are well suited to clean combustion for energy recovery, including landfill and biogas, biomass from agriculture.
A northern Australian example of this already in place is the Shoal Bay Renewable Energy Facility in Darwin. This was the first "waste to energy" facility in a tropical region. A 1MW generator which generates electricity from methane gas harvested from landfill has been connected to the grid since August 2005. The generator currently produces about 9,000MWh of renewable energy per annum, enough to power 1,200 homes and

saves over 5,000 tonnes of greenhouse gases. The CEFC has a number of such potential projects in our investment pipeline, including in northern Australian locations.

7. Concluding remarks

The geography and energy infrastructure in Northern Australia pose a barrier to its development. However there are also a number of untapped opportunities.

The CEFC has on-the-ground experience in financing projects in Northern Australia in the energy, agricultural and mineral industries which are helping to grow these industries, cut costs and create jobs. The CEFC also has also received over 20 proposals from proponents in Northern Australia providing a pipeline of potential projects that could further assist in developing the energy and agriculture industries.

From the work the CEFC has undertaken to date, we have identified a range of opportunities in Northern Australia across the agricultural, tourism, mining, local government and utilities sector where energy efficiency, low-emissions and renewable technology can boost productivity, increase efficiency and help to further develop Northern Australia.