Anglican Diocese
of the Northern Territory

20th February 2022

Ms A. Hywood
Anglican Church of Australia
General Synod Office
Suite 4, Level 5
189 Kent Street
Sydney NSW 2000

Dear Anne,

Re: Report to the Eighteenth Session of the General Synod – Protection of the Environment Canon 2007

Reference is made to your letter of 17th December 2021 in relation to the above Canon, as adopted by this Diocese. The purpose of this letter is to set out our report in relation to our progress in reducing our environmental footprint by increasing the water and energy efficiency of our current facilities and operations. At the outset, it is noted that the effect of climate change and La Nina weather patterns have had a significant negative impact on insurance premia in recent times, emphasising just how important it is to consider how each diocese impacts the environment.

Water Efficiency

Water sources and systems

The northern tropical region of the Northern Territory receives on median rainfall of 1729.1mm per annum.[1] Accordingly, the area of Darwin and surrounds have ample supplies of water for domestic and commercial use. Nevertheless, a trend of several poor wet seasons similar in 2019/20 could lead to unsustainable levels,[2] although our experience since then has been within typical range of monsoonal and wet season weather patterns.

By contrast, the southern region of the Northern Territory relies on the bores from the Amadeus Basin, drawn from Roe Creek. The future sustainability of this region is completely reliant on this supply.[3]

[1] http://www.bom.gov.au/climate/averages/tables/cw_014015.shtml
[2] https://www.powerwater.com.au/about/what-we-do/water-supply/darwin-water-supply
[3] http://www.alicewatersmart.com.au/why-save-water/

The Synod of the Diocese of the Northern Territory
A.B.N. 83 035 175 830, Incorporation Number 00160C (NT)
Diocesan Office: Corner Smith Street & The Esplanade, Darwin NT 0800
GPO Box 2950, Darwin NT 0801 Ph: 08 8941 7440 Fax: 08 8941 7446
Email: admin@ntanglican.org.au Website: www.ntanglican.org.au

Initiatives

The majority of water use in parish and rectory gardens in the dry seasons. No significant new initiatives have been implemented in 2021 in relation to water efficiency. The following initiatives are being undertaken to reduce water usage:

- Christ Church Cathedral has a rainwater capture system from its roof;
- Most parishes have water reticulation system that waters only minimal areas of church grounds with timers for night water to minimise evaporation effects;
- Most parishes "plant natives that don't require much watering through dry season";
- On average, parishes follow government guidelines to water gardens three (3) times a week for fifteen (15) minutes in the dry season; and
- One parish has replaced its underground irrigation system (Palmerston), which produced a saving of around 50% of its water usage.

Challenges

Building structures in the Northern Territory are subject to harsh varying conditions, particularly in the wet season, and must comply with codes relating to withstanding the effects cyclones in the northern region. Accordingly, the acquisition and maintenance of water storage and reticulation systems can be particularly costly and, particularly in the northern region, not cost effective as an investment. In particular, roof gutter systems are often unable to handle the sheer volume of water during wet season downpours, which is a significant challenge for the construction and maintenance of water retention systems.

In addition, it is necessary to water gardens so as to minimise the accumulation of dust during the dry season. Accordingly, water use is not easily spared during the dry season.

It should be noted that the harsh weather conditions and occasional vandalism in the Territory cause the need for regular repairs and maintenance of subterranean watering systems, often causing significant leakage until detected.

Energy Efficiency

Energy sources and systems

The energy distribution network of the Northern Territory is centrally managed by Territory Generation, relying on gas-turbines with diesel back-up, with a gross theoretical production of 624MW. The benefit of gas-turbines is that the warm start-up time per turbine is relatively small compared with coal-based systems. In addition, there is some investment in photovoltaic systems, particularly domestic rooftop systems, which are able to withstand occasional cyclonic conditions in the tropics as opposed to wind-based systems.

Initiatives

In 2021, the parish of Sanderson installed a substantial rooftop solar system. In addition, the Diocese has made prior period investments in rooftop solar systems at the parishes of Nightcliff and Fred's Pass. Whereas the investment in solar coincided with the installation of air-conditioning at Nightcliff, the parishes of Fred's Pass and Sanderson are both designed for the tropics and do not rely on air-condition, apart from small-contained offices and meeting rooms.

The Synod of the Diocese of the Northern Territory
A.B.N. 83 035 175 830, Incorporation Number 00160C (NT)
Diocesan Office: Corner Smith Street & The Esplanade, Darwin NT 0800
GPO Box 2950, Darwin NT 0801 Ph: 08 8941 7440 Fax: 08 8941 7446
Email: admin@ntanglican.org.au Website: www.ntanglican.org.au

In addition, the Diocese has entertained utility allowances to be used for solar conversions. Further, it is typical of parishes and the Diocesan Office to set air-conditioning at greater than or equal to 25 degrees when activated.

Challenges

Rooftop photovoltaic systems are able to defray the use of day-time power usage as well as feed-in to the local energy distribution network. However, on 8th April 2020 the feed-in tariff for such systems was reduced by 67%,[4] discouraging further investment. The reason for such a change in policy is arguably the significant reduction in reliability of the local energy distribution network caused by unpredictability of energy available from feed-in systems.[5]

The solar exposure patterns in the Northern Territory are noteworthy. In northern regions, the different between high/low photovoltaic production increases to a factor of 7 in the wet season, when the use of air-conditioning is most prominent, by contrast to a factor of 1.5 in the dry.[6] In the southern regions, the solar patterns are more predictable and (4.7 in the wet, 1.5 in the dry) and the rate of solar exposure is greater than the northern region by a factor of c. 3–4.[7] However, the use of air-conditioning is widespread in the wet season, when the solar exposure predictability is relatively lower, increasing the need for gas-turbines to constantly operate as backup. Further, air-conditioning is used prominently at night-time in the wet, when there is of course no solar exposure.

It is also noteworthy that the installation of photovoltaic systems is problematic in terms of the amount of space required to offset air-conditioning systems. The average domestic solar panel produces a theoretical maximum of 300Wh is 1.56sqm costing,[8] which means that "solar" coverage is theoretically capable of producing 192.3Wh/sqm. This means that a centralised 10kWh air-conditioning system (or a combination of decentralized) would require solar panels cover 52sqm at their theoretical capacity.

It is foreseeable that future investment in photovoltaic systems will not be prominent, unless environmentally sustainable energy storage systems become more readily available and cost effective. Accordingly, the Diocese will need to concentrate on reducing its energy usage, rather than attempting to invest in photovoltaic systems, particularly if that coincides with the convenience and comfort of air-conditioning.

It is noteworthy that the pandemic grants policy of the NT Government specific excluded works relating to rooftop solar, as well as being geared towards organisations with decentralised governance structures *unlike* that of the diocesan structure of the Anglican Church of Australia.[9]

Concern is expressed about the plans for the proposed National Construction Codes, which effectively impose housing standards designed for moderate climates upon regions which

[4] https://www.abc.net.au/news/2020-04-09/nt-scraps-one-to-one-solar-power-feed-in-tariff-renewables/11928988
[5] https://www.theaustralian.com.au/nation/politics/clock-ticking-in-rush-for-effective-electricity-system/news-story/7ef58489488dd1923c067d92260ef075;
https://www.theaustralian.com.au/nation/end-energy-wars-to-keep-the-lights-on-renewables-surge-to-kill-coal-power/news-story/60f8ee2df4ccf18dc6052b610a5dfef3
[6] Darwin Airport 2020 daily solar exposure http://www.bom.gov.au/
[7] Alice Springs Airport 202 daily solar exposure http://www.bom.gov.au/
[8] https://www.invensun.com/solar-panels/300w-solar-panel
[9] https://business.gov.au/grants-and-programs/Immediate-Work-Grant

The Synod of the Diocese of the Northern Territory
A.B.N. 83 035 175 830, Incorporation Number 00160C (NT)
Diocesan Office: Corner Smith Street & The Esplanade, Darwin NT 0800
GPO Box 2950, Darwin NT 0801 Ph: 08 8941 7440 Fax: 08 8941 7446
Email: admin@ntanglican.org.au Website: www.ntanglican.org.au

have desert or tropical weather patterns. A local representative of the Housing Industry Association has commented that "bringing homes up to a seven star energy rating is really just talking more and more about air-conditioning".[10] It would be reasonable to suggest that air-conditioning has a direct impact on the environment, only partially mitigated by relying on non-renewable energy sources, if at all.

Procedures and Processes

Financial Commitment

It was stated in the previous report of the Diocese that "the Diocese has incorporated into its budgeting an acknowledgment of 7% towards sustainable development and is reported to our Diocesan Council through the Registrar's Report annually." With the benefit of hindsight, the financial quantum of capital expenditure is not a useful guide for determining the relative success of our initiatives to reduce our environmental footprint.

Indeed, *the most important measure of our commitment to reducing our energy footprint is that most of our parishes do not have air-conditioning or heating systems.* However, it is evident that larger churches in the Territory are expected to have climate control systems. A commitment to at least defray the power consumption associated with air-conditioning by means of photovoltaic systems, let alone cost, will be encouraged by Diocesan Council.

Travel and technology

The extraordinary circumstances of the pandemic has led to some interesting initiatives in the use of video-conference over IP technology including the following:

a) Diocesan Synod was conducted entirely by Zoom in 2020;
b) All meetings of Diocesan Council have been conducted by Zoom since November 2020; and
c) With the use of 4G technology, Zoom meetings can be regularly conducted with church leaders and partners-in-mission in remote areas.

In addition, the Diocese continues to maintain the Bishop's hybrid vehicle, which was replaced in 2021. This vehicle is used to travel to urban and regional centres from Darwin to Tennant Creek as well as over the summer period for appearances at southern mission conferences, reducing fuel consumption by a factor of c. 2 if compared to equivalent unleaded fuel motor vehicles. Further, in 2020 our parish at Nightcliff installed bicycle racks to reduce reliance on motor vehicles. Another positive externality of the change in regular meeting format is the significant reduction in the travel and accommodation budget.

Conclusion

The main initiative in protecting the environment comprises the installation of a solar rooftop system at one parish and the replacement of an irrigation system at another. However, the parishes of the Northern Territory are arguably less reliant on water and energy when compared to other dioceses with the Anglican Church of Australia, given the tendency toward open-air worship services and meetings. Diocesan Council will continue in its endeavour to offset increased energy use with photovoltaic systems, where it is possible to do so.

[10] https://www.ntnews.com.au/lifestyle/national-building-code-could-see-the-end-of-elevated-houses-and-lourves-in-top-end/news-story/6be1af089972a6a4d6f006a77fe36563

The Synod of the Diocese of the Northern Territory
A.B.N. 83 035 175 830, Incorporation Number 00160C (NT)
Diocesan Office: Corner Smith Street & The Esplanade, Darwin NT 0800
GPO Box 2950, Darwin NT 0801 Ph: 08 8941 7440 Fax: 08 8941 7446
Email: admin@ntanglican.org.au Website: www.ntanglican.org.au

Should you require any further information in relation to this report, please do not hesitate to contact me.

Yours faithfully

David C. Ray BCom (Hons) BLitt MDiv GDDiv GCTh PhD CA
Registrar

The Synod of the Diocese of the Northern Territory
A.B.N. 83 035 175 830, Incorporation Number 00160C (NT)
Diocesan Office: Corner Smith Street & The Esplanade, Darwin NT 0800
GPO Box 2950, Darwin NT 0801 Ph: 08 8941 7440 Fax: 08 8941 7446
Email: admin@ntanglican.org.au Website: www.ntanglican.org.au