



Anglican Parish of Pukekohe

Plan for Sustainability - Discussion Document

Prepared for: Vestry, Anglican Parish of Pukekohe

Prepared by: John Allen, Sustainability Fieldworker

15 October 2019

Version 1.1

EXECUTIVE SUMMARY

Background

There is an increasing sense of urgency behind international calls for actions that provide solutions to the myriad problem now collectively labelled a climate emergency. The root cause¹ of the problems we now face has been understood for 30 years, yet governments around the world have taken few actions in that time to even address the issues, let alone solve them.

That root cause is simple in concept: in only a few hundred years, human activities have tipped the balance of nature's carbon cycle, from one that assured a 'goldilocks zone' for human, flora and fauna habitation, to one in which species extinction and displacement is accelerating.

We have upset the carbon cycle so much, that Nature no longer has the capacity to maintain a balance, resulting in the greenhouse effect which drives global warming that in turn leads to climate change, ocean acidification, sea level rise and more consequences.

There are but two prime means that we have upset the balance of the carbon cycle. One is the mining and burning of fossil fuels that add new greenhouse gases to atmosphere. The other is the harvesting of nature's carbon sinks - forests - that leave more greenhouse gases in the atmosphere. Actually, recent science research is suggesting that climate change is also driven directly from deforestation, again by human activity upsetting a cycle of nature - this time, the water cycle.

It is these two things that the world needs to address. It is these two things that we, as individuals and households, can address.

This discussion document is the first in a series of four Discussion Documents that will lead to the preparation of an over-arching Pukekohe Parish Plan for Sustainability (PPP4S). This document covers the mitigation of those two prime drivers of global warming and will lead to a Zero Carbon Plan. Future documents will lead to separate but related plans covering adaptation to climate change; assuring social justice in the transition; and living wisely within God's creation.

Objective

The goal of this discussion document is to secure a commitment that the Anglican Parish of Pukekohe become carbon negative in its business, community and social activities (to be detailed in the Pukekohe Parish Plan for Sustainability).

As achievable and ambitious as that goal is, we would set a further goal: to support our church community to also become at least carbon neutral (to be detailed in a Household Plan for Sustainability). It follows then, that the PPP4S does not seek to account for the emissions of parishioners coming to worship or other church-based activities.

The Way Forward

When developed, our plan must not be about transitioning to a "low emissions", a "net zero" or a "low carbon" operation. It must be about eliminating the root drivers of global warming from our activities and then

¹ <https://climate.nasa.gov/causes/>

restoring nature's ability to self-regulate atmospheric greenhouse gases via the carbon cycle. We will do this by:

1. eliminating the emission of new-to-the-atmosphere greenhouse gases, principally fossil carbon dioxide (CO₂) and fossil methane (CH₄), from the parish's daily activities
2. avoiding the removal of nature's carbon sinks, principally forests, but where this is unavoidable, ensuring that a significant proportion of harvested wood products are sequestered and not allowed to decay to the point of all the embodied carbon being returned to the atmosphere.
3. working to reafforest lands we have responsibility for
4. eliminating those other chemical gases that drive global warming (CFCs)

and then

5. living our lives in accordance with God's will.

We will achieve this through **direct action** on those things we have control over and through **advocacy** to others on the things we do not have direct control over.

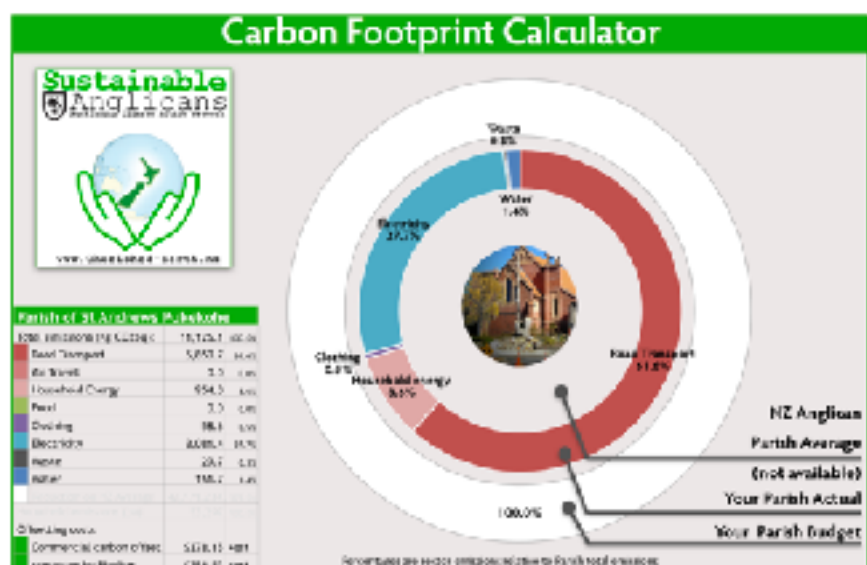
This document is staged to:

1. identify Our Carbon Footprint
2. set Emission Reduction Goals, including timings to achieve each agreed emissions reduction goal
3. set Our Carbon Budget and the staged means to achieving each agreed emissions reduction goal
4. set Further Sustainability Goals

1. OUR CARBON FOOTPRINT

The parish's carbon footprint from the operations and activities of St Andrews Pukekohe and St Pauls Buckland, as assessed through the Anglican Carbon Footprint Calculator², is for 11.3 T CO₂e of emissions per annum (see figures 0 and 1). Note that emissions from food and from capital purchases are not calculated in this assessment. There is no carbon off-setting at the moment, so gross and net emissions are the same.

As we are not aware of any other carbon footprint assessed for churches in New Zealand, benchmarking against other churches is not possible at this time. This will be a topic of further research as carbon footprinting is rolled out across the Anglican Diocese of Auckland.



² ref

This carbon footprint is presented in Fig 1 as a bar chart to enable

2018 Carbon Emissions

Assessment area	T CO2e	% of total
Parish Transport	6.98	62%
Air Travel	0.00	0%
Parish Energy	0.95	8%
Food	0.00	0%
Clothing	0.06	1%
Electricity	3.08	27%
Waste	0.03	0%
Water	0.15	1%
Capital Purchases	0.00	0%
Gross emissions	11.25	100%
less carbon off-setting	0.00	0%
Net emissions	11.25	100%

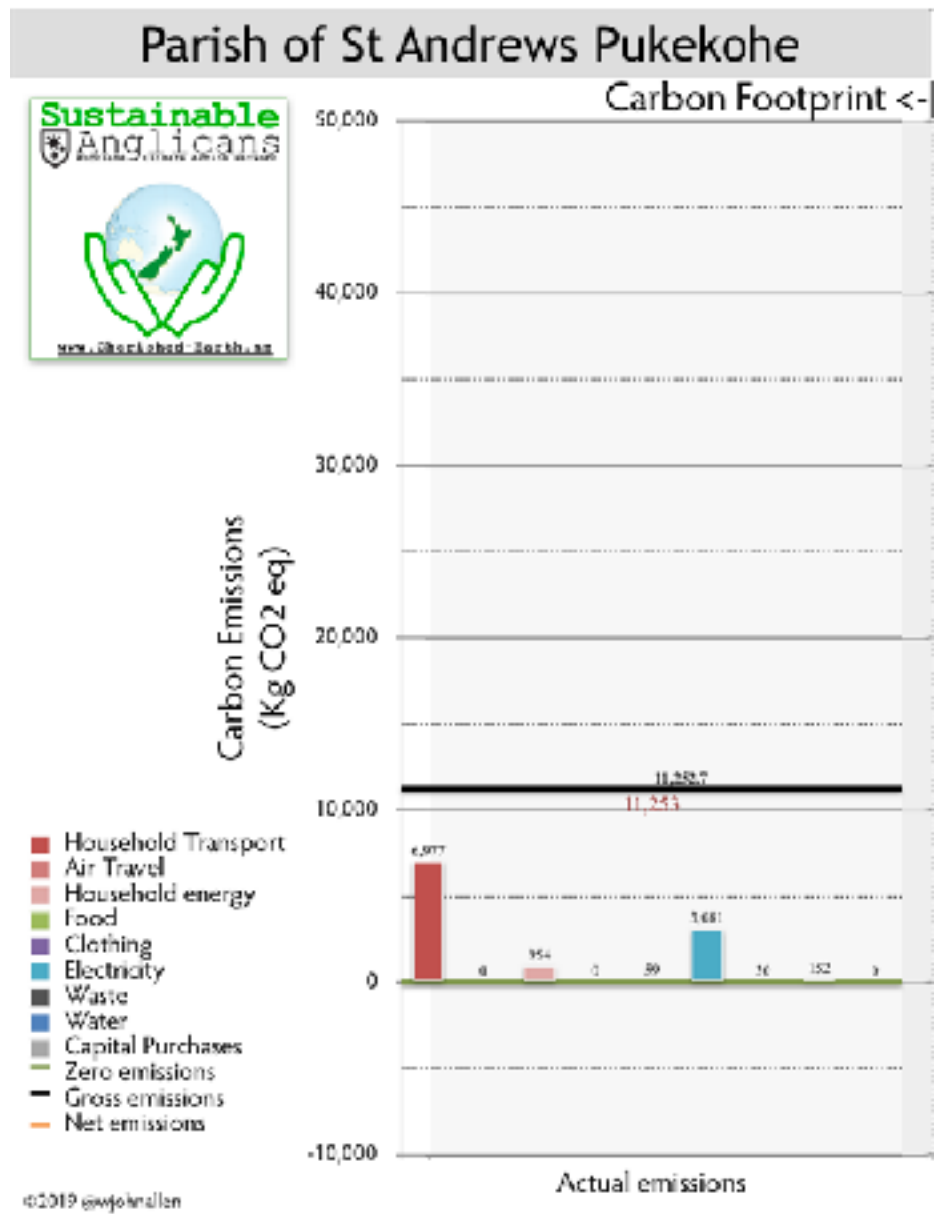


Figure 1. St Andrews + St Davids annual carbon emissions to March 2019

2. EMISSIONS REDUCTION GOALS

In the absence of actions to reduce emissions, the annual gross emissions will remain unchanged, resulting in the parish emissions profile to 2031 shown by the red line of Figure 2. Our first objective then, will be to get annual emissions down to the green line. This can be accounted for on a gross basis (the solid red line) or on a net basis where gross emissions are off-set by carbon sequestration actions (a dotted red line). In the absence of climate actions, the net and gross emissions will be the same.

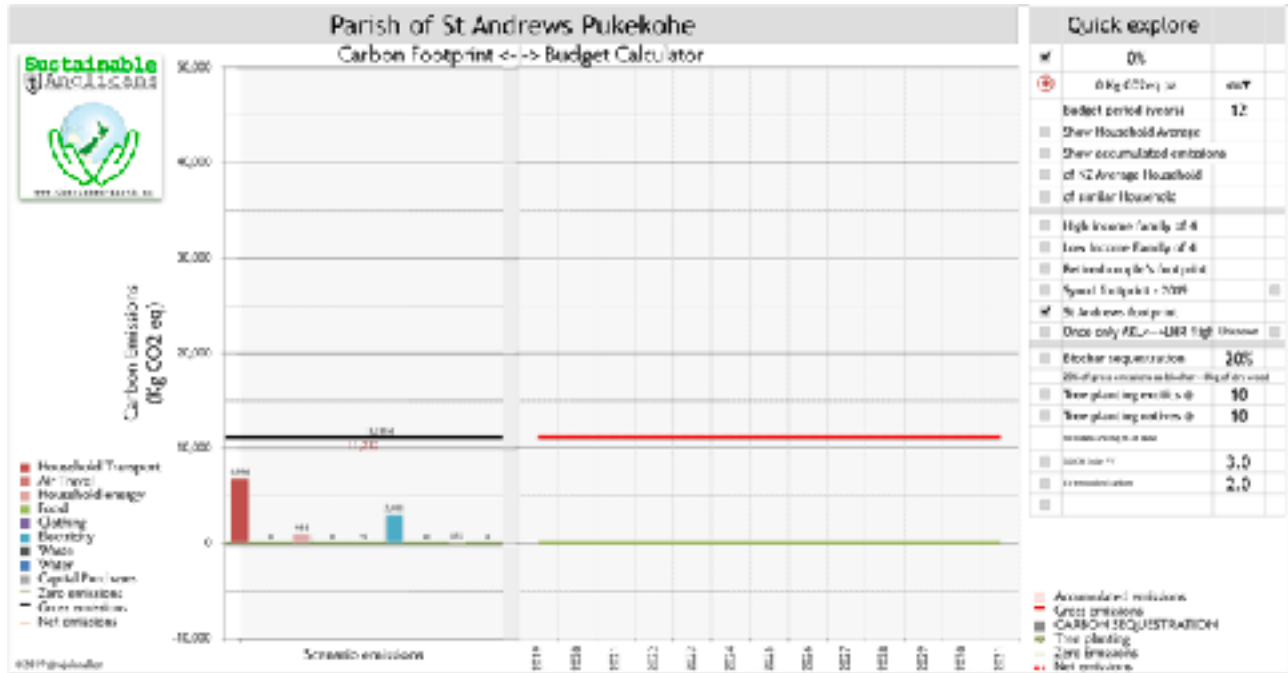


Figure 2. Annual emissions profile to 2031

An often ignored issue with carbon footprint accounting, is the longevity of new-to-the-atmosphere fossil carbon emissions (CO₂ and CH₄) when they accumulate in the atmosphere. This is shown as the shaded pink area in Figure 3. Our second objective then, is to get accumulated emissions (from 2019) down to the green line.

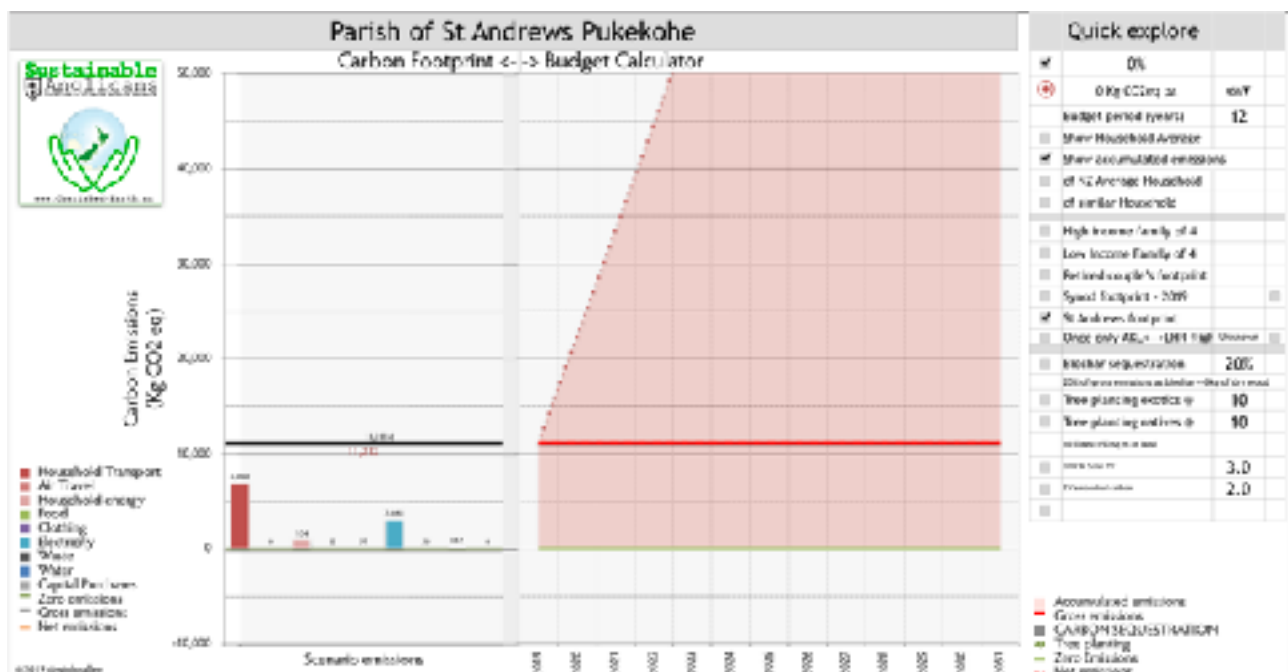


Figure 3. Accumulated emissions profile to 2031

The path to a Zero Carbon goal

I propose a transition to a zero carbon parish be via four goals:

1. a 45% reduction in annual gross emissions from 11.2 T CO₂e in 2019 to 6.2 T by 2025 (a 5 T reduction).
2. a further reduction to achieve net zero annual emissions by 2030 (may use carbon off-setting strategies)
3. the elimination of all fossil fuel emissions by 2040 (that is, gross fossil emissions are zero and any carbon off-setting technologies then become a carbon dioxide removal (CDR) strategy).
4. the elimination of all accumulated carbon emissions by 2050

These goals are fully consistent with the personal submission³ to the Zero Carbon Amendment Bill.

3. OUR CARBON BUDGET

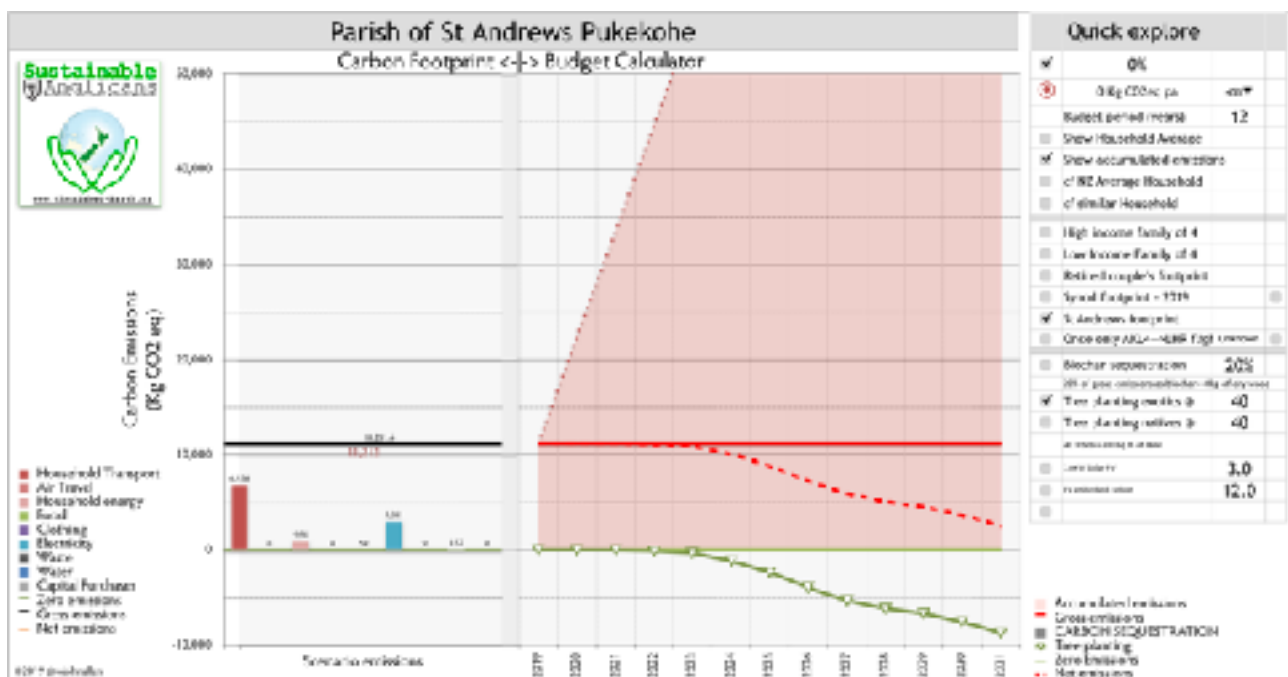
To achieve those goals, I propose a staged strategy starting in 2020.

Proposed Stage 1

Proposal: to plant 40 trees across 200 sq m of available land in 2020.

Rationale: based on the Ministry for the Environment carbon sequestration rates for exotic hardwood trees (developed for accounting purposes under the Emissions Trading Scheme (ETS)), these 40 trees will have sequestered 7.5 T CO₂ over the 10 years to 2030. The reason for planting the trees in 2020 is that the annual growth profile of trees does not result in significant carbon sequestration rates until 4-5 years after planting. This effect is shown in Figure 4 (green line with triangles).

Note the red dotted line showing net emissions and that this line goes through the 45% reduction emissions level of 6,000 Kg CO₂ in 2027 (ie beyond the 2025 goal).



³ <https://cherished-earth.org.nz/2019/08/07/personal-submission-on-the-zero-carbon-amendment-bill/>

Issues: 1. by itself, this Stage 1 proposal will not achieve any of Goals #1, #2, #3 or #4 in the time scales stated for each.

2. Planting trees to offset fossil fuel emissions is not seen as a sustainable strategy. What the world needs to mitigate the drivers of global warming is both a reduction in fossil fuel emissions, plus an increase in natural carbon sinks - forests. We need to take action in both areas.

Planting trees can be either a carbon sequestration action (which mitigates global warming) or a carbon offsetting action (which does no mitigation). It cannot be both. Whilst using forestry to offset emissions is justifiable if and only if the tree plantings would not have otherwise happened, it is still less than desirable. Which is why increasing the number of trees planted (60 stems would achieve the goals by the stated timelines) is discounted as a solution.

Solutions: 1. reduce emissions more aggressively using biochar as a sequestration technology.
2. defer the timescales (Goal #1 to 2026/27, Goal #2 to 2033 and Goals #3 and #4 to 2045).
3. implement Stage 2.

As well: If the trees planted are fruit trees, then this will also be a start to other social justice and adaptation goals around food security (fruit trees may require a different planting density to achieve the same sequestration rate).

Still to do: Identify land suitable for a permanent food forest plantation.

Proposed Stage 2

Proposal: to purchase in 2022, a new electric car (EV) to cover the vicar's annual mileage of 25,000 km.

Rationale: a battery EV as a replacement for the vicar's existing ICE vehicle will reduce transport emissions from just under 7 T CO₂e per year, to just under 2T (the EV is assumed to have been purchased at the beginning of the year). This emissions reduction is offset by the EV's embedded (manufacturing) emissions of 12 T CO₂e, giving a carbon payback period estimated at ...¼ years. The new annual emissions profile then, is shown in Figure 5.

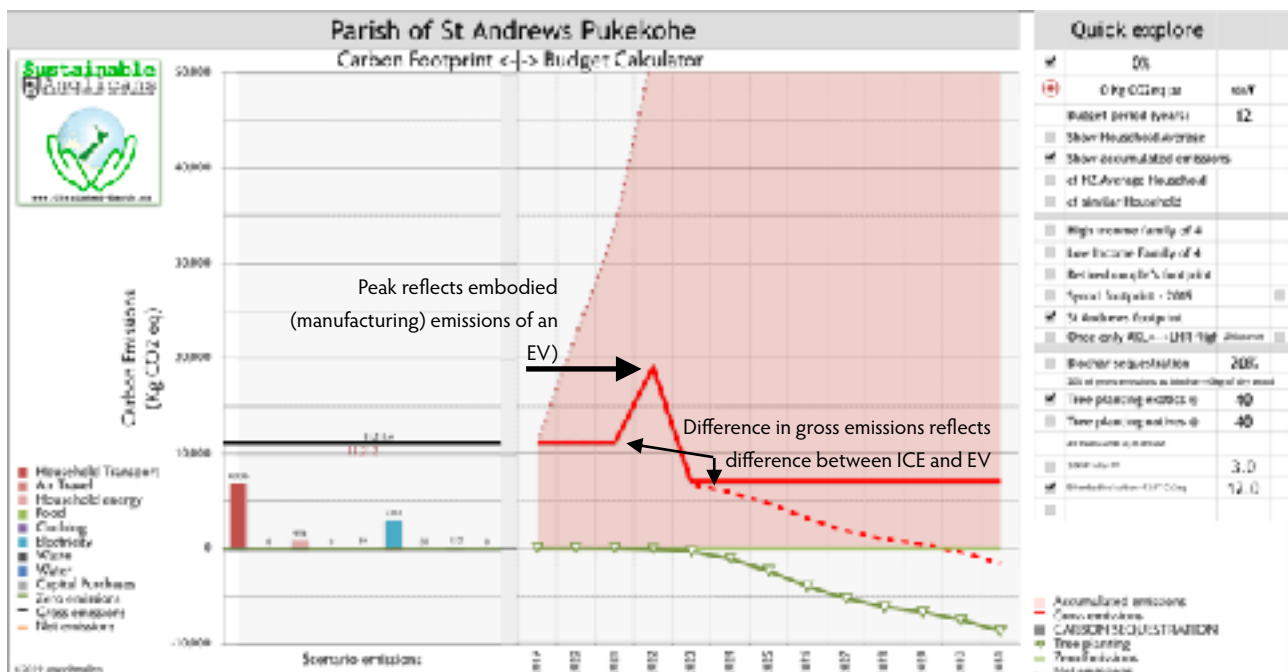


Figure 5. Annual emissions profile from planting 40 trees to offset future emissions

Stages 1 + 2 together achieve the goals ahead of schedule:

1. 45% reduction in 2024;
2. net zero in 2029;
3. #3 in 2040.

Issues: _____ The capital cost of the battery EV.

Solutions: 1. Purchase a second hand EV (in which case the embedded carbon cost will not come to charge)
2. Fundraise for the purchase of a new battery EV

Still to do: Research funding sources for the purchase of a battery EV.

4. FURTHER SUSTAINABILITY GOALS

Proposed Stage 3

Proposal: _____ to establish a Social Enterprise, tentatively named Anglican Community Energy, based on solar panels installed on St Andrews Centre's north-facing roof tops.

Rationale: _____ Stages 1 and 2 are global warming mitigation strategies. This stage 3 is also about mitigation (it will reduce emissions from electricity generation) but is also a climate change adaptation strategy (energy security for the parish and for subscribers to the social enterprise) that also meets social justice needs. It will also provide a future revenue stream for the parish.

Proposed Stage 4

Proposal: _____ to establish a social enterprise, tentatively named 'Franklin Kai', a food hub connecting local growers (both commercial and casual) with local consumers. It is envisaged that the parish emergency food parcel service would be incorporated in to the food hub and with recipients participating in the food hub via a proposed 'Franklin Time Bank' scheme.

Rationale: _____ ... to do

Proposed Stage 5

Proposal: _____ to establish a 'Repair Cafe' and an associated 'Menz Group' to repair and recycle tools and appliances, so reducing waste going to landfill and achieving emissions reduction from the embodied carbon in new appliances.

Rationale: _____ ... to do

Proposed Stage 6

Proposal: _____ to ...

Rationale: _____ ... to do