Ironbark Sustainability

Viva Energy Australia Gas Import Terminal Emissions Analysis

Prepared for
This report has been prepared for Geelong Renewables Not Gas.

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About Ironbark Sustainability
Ironbark Sustainability is a specialist consultancy that works with government and business around Australia by assisting them to reduce energy and water usage through sustainable asset and data management and on-the-ground implementation.

Ironbark has been operating since 2005 and brings together a wealth of technical and financial analysis, maintenance and implementation experience in the areas of building energy and water efficiency, public lighting and data management. We pride ourselves on supporting our clients to achieve real action regarding the sustainable management of their operations.

Certified B Corporation

Ironbark are a certified B Corporation. We have been independently assessed as meeting the highest standards of verified social and environmental performance, public transparency, and legal accountability to balance profit and purpose.

Our Mission
The Ironbark mission is to achieve real action on sustainability for councils and their communities.

Recognition of traditional custodians

Ironbark Sustainability recognise First Nations peoples as the Traditional Custodians of the lands on which we live and work. We acknowledge sovereignty over their land was never ceded and the impact of this ongoing dispossession continues to this day. We stand in solidarity with First Nations people in calling for the establishment of a First Nations Voice in the Constitution, as described in the Uluru Statement from the Heart. We further support calls for the establishment of a Makarrata Commission on agreement-making and truth-telling between Aboriginal and Torres Strait Islander peoples and governments.

Ironbark Sustainability maintains offices on the traditional lands of the Wurundjeri people of the Kulin Nation, the Darug people and the Muwinina people. We pay our respects to all First Nations Elders past, present and those emerging and we commit to building relationships that support self-determination and the healing of Country.

This report is written for the Geelong region which incorporates the lands of the Wadawurrung, Gulidjan and Gadubanud and Eastern Maar traditional custodians. We acknowledge their custodianship for thousands of years, their advocacy and continuing care of the country.

Table of contents

1. Executive Summary
2. Introduction
3. Emissions profile
4. Science derived target
5. Emissions analysis
6. Methodology
7. Conclusion
8. References

Photo by KBO Bike on Unsplash.

1. Executive Summary

Viva Energy Australia (Viva) is seeking approval to develop a gas import terminal at the Geelong Refinery. The Gas Terminal project would see liquefied natural gas shipped in from currently undefined locations, to be processed at the facility and injected into the Victorian distribution network.

An Environmental Effects Statement (EES) has been submitted by Viva as part of the requirements of the approval process for the project, and the greenhouse gas emissions identified by Viva in the EES warrant further investigation.

This report provides an objective evaluation of the greenhouse gas emissions resulting from Viva's current (refinery only) and projected (refinery + gas import terminal) operations.

The report assesses Viva's emissions as well of those of Geelong as a whole, against the emissions reduction targets set by both the City of Greater Geelong (net-zero community-wide by 2035) and the Intergovernmental Panel on Climate Change.

The report's key findings pertaining to the City of Greater Geelong and the Viva emissions analysis are below:

The City of Greater Geelong

•Current emissions from the City of Greater Geelong were calculated to be 4,278,235 tC02e with Viva Energy's existing operations making up ~35% of these emissions.
•The City of Greater Geelong has a commitment to achieve net zero emissions community wide by 2035.
•Viva's proposed Gas Terminal Project will increase the emissions of the City of Greater Geelong by 455,010 tCO2e each year - this will increase Viva's contribution to 52% of all emissions in Greater Geelong by 2040.
•The proposed Gas Terminal project will be a significant and persistent source of emissions that will make it much harder to reach the City of Greater Geelong's emissions target.

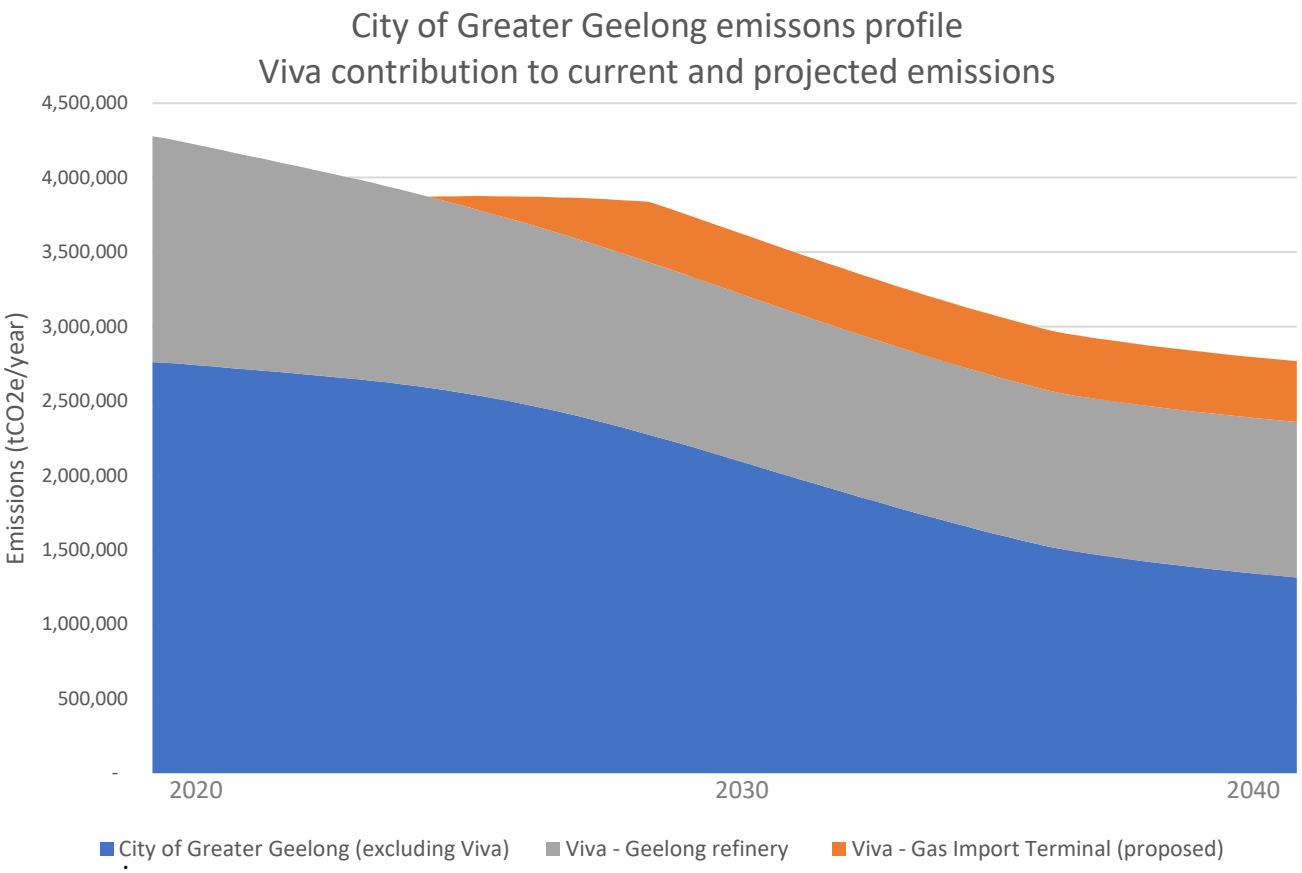
Emissions analysis

•Viva's stated emission figures in their EES for the proposed Gas terminal project exclude the largest source of emissions – Scope 3 transport emissions (the emissions from shipping the gas to the terminal).

•Once transport emissions are included (as required by the global standard for reporting emission), the annual emissions associated with the proposed gas terminal are between 9.5-11.6 times higher than stated in Viva's EES.

•AGL correctly included transport emissions in their EES for their rejected Crib Point gas import terminal, which was almost identical to Viva's proposal. The Independent Inquiry and Advisory Committee for AGL's EES acknowledged that including Scope 3 transport emissions in the total was a relevant inclusion.

This figure shows the City of Greater Geelong's projected emissions over the coming decades, with a Business as Usual analysis based on current trends (such as reduced emissions from grid supplied electricity, adoption of electric vehicles and a reduction in gas use in residential and commercial properties – refer to item 3 in the methodology).



Viva's current operations (grey) currently make up 35% of the total municipal emissions. This proportion is projected to grow to over 50% by 2040, including the proposed Viva Gas Import Terminal project emissions (orange).

2. Introduction

This report provides an assessment of Viva Energy Australia's proposed Gas Import Terminal expansion and how this will impact the wider community.

The impacts of climate change are well established with increasing emissions clearly resulting in more intense and frequent storms, heatwaves, droughts, sea level rise, bushfires and other extreme weather events. International, national, state and local governments and communities are galvanising efforts to reduce emissions at speed and scale across society.

The Victorian State Government has set a net zero by 2050 target with world-leading legislation to drive action on climate change across government and the economy. The City of Greater Geelong recently endorsed a net zero by 2035 community-wide emissions reduction target. Viva Energy's operations currently make up the largest component of the Cities' emissions (35%).

The social license to proceed with fossil fuel projects is diminishing and there is significant change in the energy market with rapid uptake of renewables and battery storage, and rapid closure of coal fired generation, with uncertain impacts for energy cost and supply.

The Victorian Snapshot profile shows that 14% of the state's emissions come from gas, with 8% used in residential homes primarily for heating in winter. Increasing gas infrastructure, supply and accessibility will entrench this component of emissions for decades to come and make meeting local or state targets significantly more challenging.

Proceeding with operations such as Viva Energy's Gas Import terminal will provide gas supply, however there are alternative, cost-effective and practical solutions that simultaneously save money, reduce emissions and improve health outcomes for residents. Upgrading to efficient electric appliances running on renewable energy will reduce gas demand and avoid dependance on fossil fuels, increasing energy security and affordability.

Ironbark Sustainability's Roadmap to Zero Emissions: Geelong Region Jobs Analysis demonstrates there over 24,000 local jobs could be created in the next five years supporting an ambitious pathway to net zero emissions. This opportunity dwarfs the 150-200 construction jobs and 50-70 permanent jobs Viva estimates the gas terminal expansion will create.

The Geelong region in particular holds significant opportunities in the rapid and ambitious transition to zero emissions. State and local governments, local business and industry, and community all have a role to put in place plans to capitalise on these opportunities.

3. Emissions profile

The following figure shows the emissions profile for the City of Greater Geelong for the 2019-20 financial year as provided by the Snapshot Community Climate Tool. Figure 1 shows emissions from electricity and gas (residential, commercial and industrial), transport, agriculture and waste sectors. Further sector breakdowns are described in the Table 1. Greenhouse gases are measured as tonnes of carbon dioxide equivalent (tCO2e), representing the amount of total greenhouse gases emitted as an equivalent amount of CO2.

The profile provides an indication of the scale of transformation required. To meet international, state and local targets, emissions from these sectors need to be rapidly reduced to zero or offset by land-use sinks.

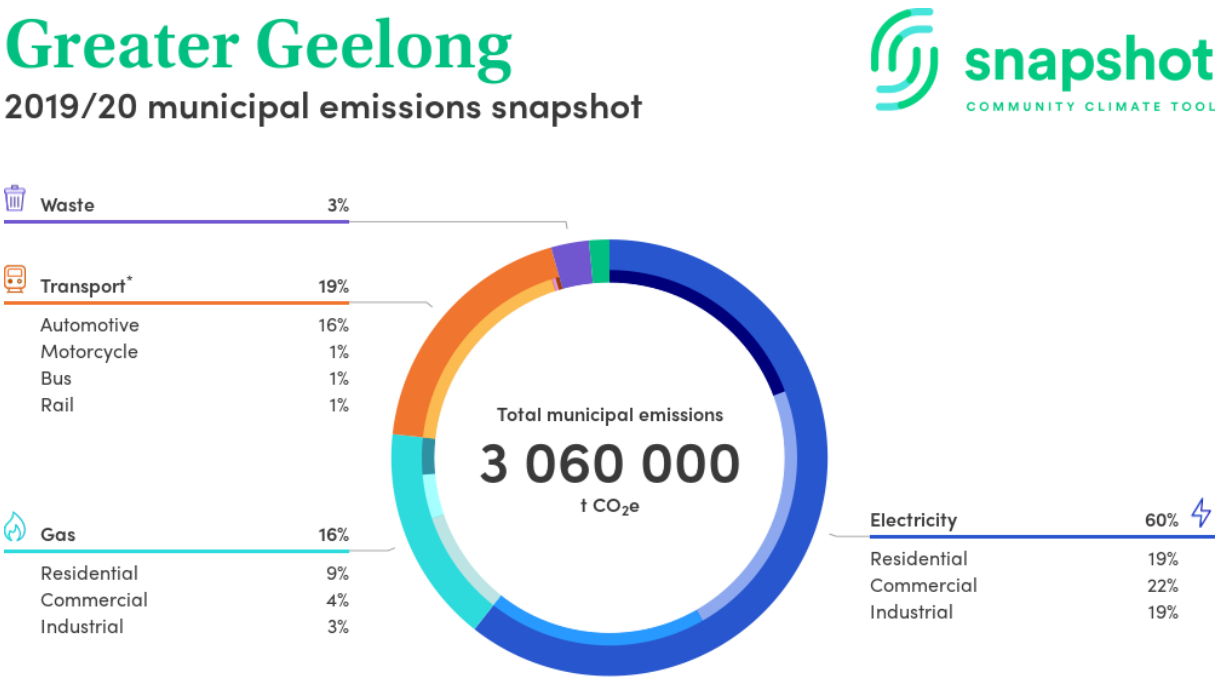


Figure 1. 2019-20 Emissions profile for Greater Geelong.

Table 1. Greater Geelong emissions breakdown by source and sector

Greater Geelong
2019/20 municipal emissions snapshot

snapshot
COMMUNITY CLIMATE TOOL

Source	Sector	Emissions (t CO_2e)
Electricity	Residential	589 000
	Commercial	688 000
	Industrial	578 000
Gas	Residential	280 000
	Commercial	116 000
	Industrial	97 000
Transport*	Automotive	559 000
	Motorcycle	2 000
	Bus	9 000
	Rail	10 000
	Tram	0
	Aviation	0
Waste	Landfill	51 000
	Water	35 000
Agriculture		46 000
Land Use		-1 000

Land Use data is not used in the chart nor the displayed total municipal emissions.

* Transport activity data from Google Environmental Insights Explorer

Characteristics	
Land area	1 248 km^2
Population	261 900
Gross regional product	$ 12 861 700 300
Climate zone	6

The 3,060,000 tCO2e that the Snapshot tool reports is an underestimate of the emissions for the Greater Geelong region because of the methodology that the tool adopts. The Snapshot methodology distributes Viva's emissions across the state, according to population and ABS statistics, rather than allocating all of Viva's emissions to the Greater Geelong region.

If Viva's existing emissions are added to the Greater Geelong emissions total, it would be 4,278,235 rather than 3,060,000 tCO2e. This creates the discrepancy between Figures 1 and 3.

Note that Snapshot profiles do not currently include emissions from Industrial Products and Processes which would add approximately an additional five percent to the total emissions profile. Snapshot will be updated with new information as reliable, nationally consistent data sources become available.

4. Science derived target

An emissions reduction target for an organisation, entity or community is considered science-derived when it is aligned with the broader emissions reduction required to keep global temperature increase below 2°C compared to preindustrial temperatures, as described in the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC).

The science-derived target for Greater Geelong is based on Australia's carbon budget (total volume of greenhouse gases that can be emitted to 2050), as established by the Climate Change Authority in 2013. This budget is considered the most robust and accepted Australian carbon budget and aligns with the international carbon budget developed by IPCC, notwithstanding associated limitations, risks and challenges.

Greater Geelong's scaled community-wide carbon budget is 43.4 $MtCO_2$-e. This budget will be exhausted by 2033 based on current projections in line with current trends of mitigation actions.

If governments, Councils, the broader community, business and industry and other stakeholders undertake urgent action to reduce emissions, then this budget will stretch further.

There is a wealth of information demonstrating that a target of 2°C is not an acceptable risk to avoid the effects of catastrophic climate change. To keep temperatures to 1.5°C targets and timeframes will need to be more ambitious.

To reach net zero by 2035 (in line with the municipal-wide target of the City of Greater Geelong), the Geelong region needs to reduce emissions by 6.25% each year - which equates to an annual reduction of 267,390 tCO2e. This is with an assumption of a linear reduction trend, an unlikely trajectory, with emissions more likely to reduce slowly initially and ramp up over time.

The Snapshot data demonstrates that Greater Geelong is currently reducing emissions at an average rate of 121,333 (tCO2e) per year, down from 3,534,000 (tCO2e) total municipal emissions in 2017 to 3,170,000 in 2019. This trend is primarily due to deindustrialization of the region and decarbonizing of the electricity grid.

Table 2. Annual emissions reduction required to meet 2°C net zero targets of 2035 and 2040 for the City of Greater Geelong.

Annual emissions reduction amount	2035
Percentage	6.25%
Tonnes CO2e	267,390

5. Emissions analysis

Context

This report proves an assessment of the greenhouse gas emissions associated with Viva's current and proposed operations including Gas Import Terminal Project. The analysis is conducted in line with the principals of the internationally recognised Greenhouse Gas Protocol (GHG Protocol) including relevant Scope 1, 2 and 3 emissions.

The analysis includes:

- Current operational emissions of Viva Energy's refinery
- Comparison of Viva's reported emissions for the Gas Import Terminal to AGL's similar Crib Point project
- Comparison of the total emissions for Greater Geelong in 2020, 2030 and 2040 with and without the proposed new gas terminal project
- A revised carbon budget including the proposed gas terminal project and projected emissions in 2035.

The report does not include analysis of the construction phase of the project.

A recent report produced by the ACF's Investigations Unit and the Australian National University titled 'Emissions exposé' found that emissions estimates during approval processes for fossil fuel projects are not an accurate predictor of actual emissions. The report found that one in three fossil fuel projects emitted more than estimated during the approval process and one in five emitting significantly more than estimated.

Current operational emissions

Viva provides annual and quarterly information on Scope 1 emissions described in Table 3. Viva Energy currently produces on average over one million tonnes of operational Scope 1 CO2e emissions. These emissions make up 35% of the Snapshot emissions profile for the City of Greater Geelong.

Table 3. Viva Energy's annual reported emissions

Viva - Safeguard Facility Reported Emissions (Scope 1) (tCO2e)				
	2017/18	2018/19	2019/20	Average
Annual	1,050,846	1,101,920	985,025	1,045,930
Quarterly	262,712	275,480	246,256	261,483

Emissions including proposed Gas Terminal

There are three potential modes of operation for the Viva gas import terminal project – open loop, closed loop and combined loop modes. These modes relate to the method in which the gas is reheated by the regasification unit. Open loop uses the ambient temperature of seawater, Closed loop uses gas fired boilers and Combined loop uses seawater for the majority of the time and gas fired boilers for 30 days a year as it is presumed that the temperature of water in the bay is too low.

This analysis uses the combined loop mode of operation as the basis for our assessment, noting it is the most realistic in the short term.

Viva assumes the usual operating mode is open loop, with closed loop used in worst case scenarios. The open loop mode generates significantly less emissions with a combined and closed loop systems generating an additional 17,374 and 131,079 tCO2e per year, respectively (Table 4).

Table 4. Comparison of operational modes (Viva Energy Gas Terminal Project EES)

Mode	Total annual greenhouse gas emissions tCO2 -e	Additional emissions
Open loop	47,906	-
Combined loop	**65,280**	**17,374**
Closed loop	178,985	131,079

Table 5. Current and additional annual operational emissions from Viva

Viva Energy - current and additional annual operational emissions (Scope 1+2 tCO2e)	
Current operations (reported)	1,045,930
Current operations Scope 2 (statistical estimate)	471,972
Scope 3 (transport emissions)	Not available
Total current operations	1,517,902
Additional – proposed Gas Terminal (combined loop)	65,280
Total	**1,583,110**

Combining the existing emissions from Viva's Geelong existing operations and the combined loop emissions from the proposed additional Gas Terminal project results in an annual total of 1.58 million tCO2e.

Scope 3 emissions

According to the Greenhouse Gas Global Protocol for Cities (GPC) - the international accounting and reporting standard to measure emissions - and the National reporting schemes (NGER), Scope 1 and 2 emissions are required to be reported. Scope 3 emissions are indirect emissions from sources not owned or operated by the organization, some of these need to be included but there is some discrepancy in which emissions should be counted for EES.

Viva's EES emissions estimates currently excludes most Scope 3 emissions, in particular the emissions associated with transportation of LNG to the terminal (Figure 2).

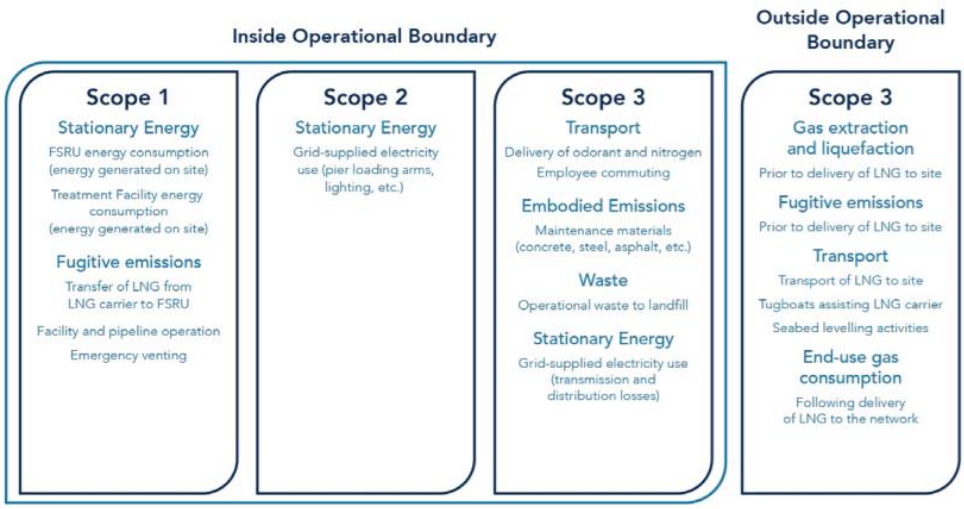


Figure 2. Emissions included and excluded in Viva's EES statement (Source: Viva Energy Gas Terminal Project – EES0 Chapter 9)

The GPC is the global standard for city-level emissions reporting and identifies ways in which Scope 3 emissions are to be included in a cities inventory. The standard states that Scope 3 emissions should be included through existing reporting frameworks where they are intimately connected to the operation of the facility and would not have been incurred without the facility being there.

Emissions associated with Scope 3 transport (transport that occurs outside of the municipal boundary but that ends within the municipal boundary) are to be assigned to the municipality in its transport emissions sector. Normally this is assigned at a 50% weighting because it is assumed that the balance of the emissions would be allocated to the municipality of origin (where the gas is extracted from). When the place of origin is not a municipality (i.e. offshore gas), 100% of the transport emissions should be allocated to the destination municipality to ensure that there are no gaps in reporting.

Comparison to AGL's reported gas terminal emissions

The only comparable project in Victoria to Viva Energy's gas import terminal proposal is AGL's rejected gas import terminal at Crib Point in Westernport Bay. That project also went through an EES process, and the Independent Advisory Committee's report stated "*The consideration of Scope 3 GHG emissions associated with upstream transport of LNG to Crib Point is relevant and significantly increases the Project's GHG emissions*". We note that AGL's EES did include emissions from transport of the LNG to Victoria within the Scope boundary (AGL Crib Point Terminal EES, Chapter 11, Figure 11-2), whereas Viva Energy's does not.

As exemplified in the determinations on the Crib Point application, the emissions associated with transporting the fuel to the facility are a prerequisite for the facility to operate and would not be incurred without its existence. Additionally, reporting frameworks such as the GPC Protocol 2 accommodate Scope 3 emissions associated with transport where the trip ends within the municipal boundary, a standard that is increasingly understood as best practice internationally.

In line with the GPC protocols and the recommendations of Independent Advisory Committee of AGL's Crib Point Gas Terminal Proposal, we have included consideration of Scope 3 Transport emissions Greenhouse Gas emissions in this analysis.

An estimate of Viva's Proposed Scope 3 Transport emissions can be made by comparison with the AGL Crib Point Terminal operational emissions. We estimated the upstream Scope 3 emissions of the Viva facility based on the reported emissions for the AGL Crib Point facility. Both AGL and Viva estimate gas imports of up to 160 petajoules (PJ) per year, with similar proposed facilities and source of feedstock.

Table 6. AGL Crib Point Operational Emissions

AGL Crib Point Operational Emissions (tCO2e)				
	Scope 1	Scope 2	Scope 3	Total
Open loop	57,500	2,160	389,730	449,390
Combined loop	17,370			17,370
Total	74,870	2,160	389,730	466,760

Table 7. Comparison of AGL and Viva's Proposed Gas Terminal – Operational Scale

Facilities - Operational Scale		
Viva – Proposed Gas Terminal	160	PJ
AGL – Proposed Crib Point Terminal	160	PJ
Ratio	100%	

Table 8. Current and additional annual operations emissions from Viva Energy's Geelong operations and the proposed gas import terminal.

Viva Energy – current and additional annual operational emissions (tCO2e)	
Current operations (refinery)	1,517,902
Proposed Gas Terminal – (combined loop)	65,280
Proposed Gas Terminal – Scope 3 transport (AGL based estimate)	389,730
Sub total – Proposed Gas Terminal	455,010
Total – Viva Energy Geelong	**1,972,912**

Table 8 shows calculations for Scope 3 Transport emissions for the proposed Viva Gas Terminal Project would result in an additional 389,730 tCO2e per annum and the total annual emissions from Viva operations would be almost two million tonnes CO2e.

According to Viva's own assessments, these numbers could be higher if the fuel is transported from outside the region. Viva Energy's Technical Report C Greenhouse Gas Assessment, Appendix A shows fuel transport emissions ranging from 165,500 tCO2e, if gas is sourced from Australia, to 553,400 if gas were to be supplied from Qatar.

Table 9 demonstrates Viva has significantly underestimated the emissions associated with the proposed gas terminal by excluding emissions from transporting LNG to Victoria. Their smallest estimate (using open loop assumptions) is 9.5 times less than the emissions we have calculated, or 11.6 times less, if the fuel is transported from other regions.

Table 9. Comparison of emissions from Viva's EES statement

Emissions assumption	Emissions (tCO2e)	Order of magnitude difference
Open loop – no Scope 3 emissions	47,906	1
Combined loop – no Scope 3 emissions	65,280	1.4
Combined loop + Scope 3 transport emissions (AGL Based estimate)	455,010	9.5
Combined loop + Scope 3 transport emissions (international)	553,400	11.6

Greater Geelong – Viva's emissions contribution

In 2019, Viva's current operations made up 35% of the City of Greater Geelong's annual emissions profile. The additional emissions from the proposed gas terminal will make this proportion even greater. Figure 3 shows the total emissions of Greater Geelong over the coming decades, with a Business as Usual analysis based on current trends.

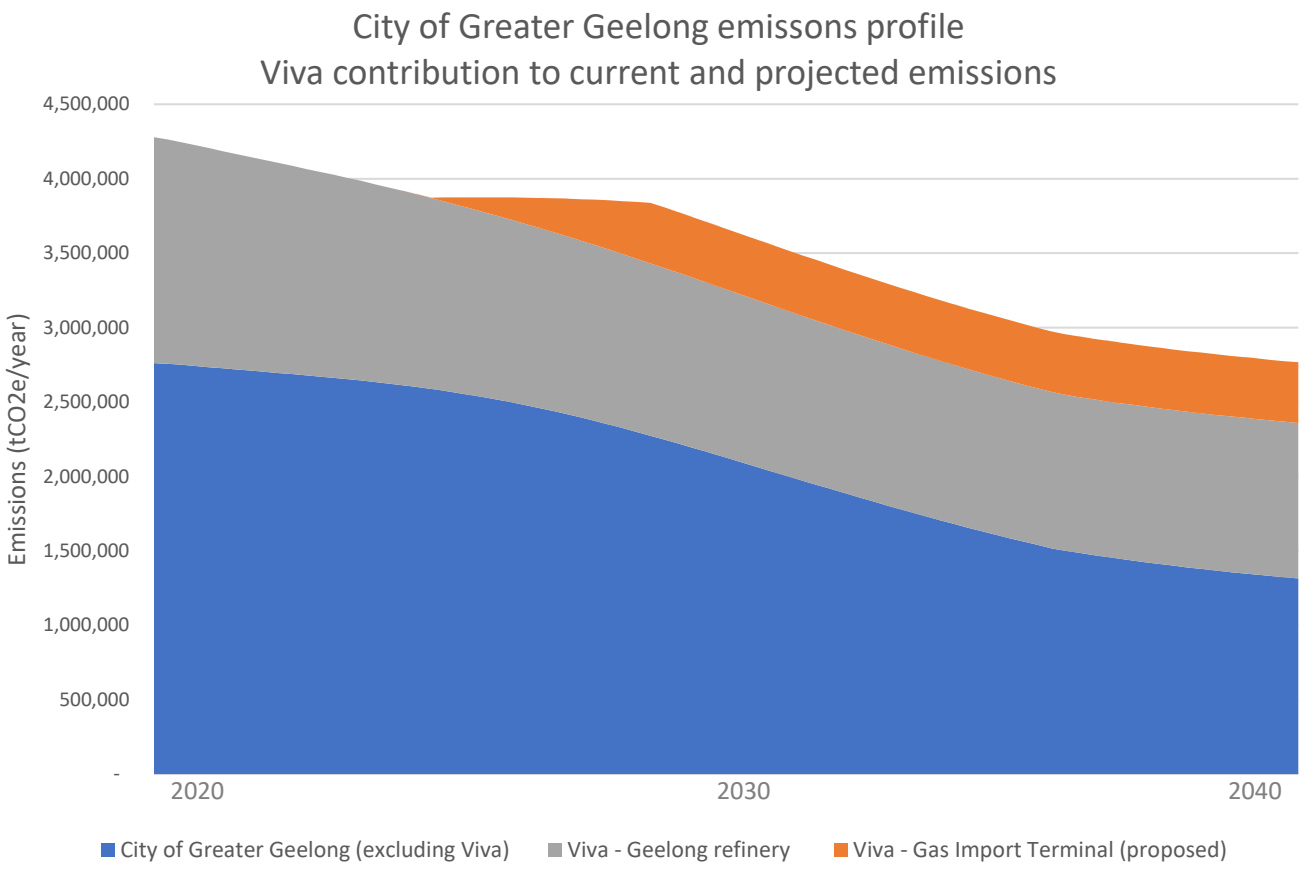


Figure 3. Business as Usual emissions projections for the City of Greater Geelong.

Viva's current operations (grey) currently make up 35% of the total municipal emissions. This proportion is projected to grow to over 50% by 2040, including the proposed Viva Gas Terminal project emissions (orange).

Table 10. Proportion of the City of Greater Geelong's emissions from Viva operations (current and projected)

Emissions (tCO2e)	2020	2030	2040
Total emissions BF City of Greater Geelong (BaU)	4,278,235	3,646,649	2,771,339
A. Total emissions - excluding Viva's existing operations	2,760,333	2,111,826	1,339,361
Proportion of total City of Greater Geelong emissions	65%	58%	48%
B. Viva – refinery (Scope 1 + 2)	1,517,902	1,137,319	1,025,064
Proportion of total City of Greater Geelong emissions	35%	31%	37%
C. Viva – projected emissions from the gas import terminal	0	397,504	406,914
B + C. Viva's total emissions including the proposed gas import terminal	1,517,902	1,534,823	1,431,978
Proportion of City of Greater Geelong emissions from Viva	35%	42%	52%

Table 10 shows the proportion of Greater Geelong's emissions from Viva operations in 2020, 2030 and 2040. The proportion increases from 35% in 2040 to 52% in 2040 including the projected emissions from the proposed gas import terminal.

Carbon budget

If the Viva Energy gas terminal was to proceed, the total carbon budget for Greater Geelong would be used up significantly faster, than if the terminal did not go ahead. This analysis finds the carbon budget would be used up in 14 years with Viva's gas terminal, 2.5 years faster that a scenario without the terminal.

Table 11. The City of Greater Geelong Carbon budget analysis.

Carbon budget		
Original carbon budget (SDT methodology)	43.4 M	tCO2e
Revised carbon budget (including Viva emissions)	61.8 M	tCO2e
Current trajectory	16.5	Years left
Revised with Viva proposed gas terminal	14	Years left
Difference in trajectory	2.5	Years

6. Methodology

This analysis was undertaken using the following methodology.

1. Viva emissions
For the determination of emissions for the Viva Gas Terminal, we have taken the assumed operation of the combined cycle as the facilities true operating emissions. Additionally, we identified total emissions by examining the capacity of the Viva Gas Terminal compared to the similar Crib Point plant and a comparison with the emissions calculated in the Viva EES.

2. Emissions profile
To determine the emissions for the municipality of Geelong, we used the Snapshot Climate data Tool and augmented it with Scope 1 emissions information from the Safeguard Mechanism Reporting Facility, which identifies the existing Viva plant as a key emitter. The Snapshot emissions profile for Greater Geelong was adjusted upwards based on a three-year average for reported emissions from this facility.

3. Emissions projections
The future projection of emissions is based on identified trends in population and economic activity, as well as projected trend in emissions intensity of grid supplied electricity, adoption of key drivers such as electric vehicles, and degasification trends in residential and commercial properties. The projection figures are provided from our Evidence Based Action Planning tool and have been developed from materials prepared by the Victorian and Federal Governments in addition to direct consultation with experts in the field.

4. Future trends
The future trend of the Viva facility is based on an inception year of 2025 and a four-year phase into full capacity. We have assumed there is no annual variation in the anticipated emissions for the facility. The projections are based on a business as usual trajectory from trends we see in place (such as shifts in emissions intensity of the grid, and adoption of EVs). Proactive steps are needed to achieve this target, steps that may be currently unclear or in development.

5. Carbon Budget
The carbon budget is determined using the Science Derived Target methodology developed by Ironbark, and correlates to the Paris Agreement's 2-degree target and the 10.1G tCO2e Australian Carbon Budget determined in 2013. We use an apportionment process that uses a region's emissions inventory, and other characteristics such as relative growth and SEIFA* ranking. We then applied three methods to determine the rate of reduction of this inventory.
1. The runway for no change to current annual emissions
2. The runway with projected changes to annual emissions
3. The runway with projected changes to annual emissions, incorporating the impact of the proposed Viva facility.

*SEIFA is a standard mechanism used by the federal government. SEIFA provides measures of socio-economic conditions by geographic area. Socio-Economic Indexes for Areas (SEIFA) is a product developed by the ABS that ranks areas in Australia according to relative socio-economic advantage and disadvantage.

7. Conclusion

This report provides an assessment of the emissions of the City of Greater Geelong and the current and potential operations of Viva Energy's project in the region.

Further approval, development and subsidy of fossil fuel projects will continue to worsen the impacts and risks from the heatwaves, bushfire, flood and drought we are seeing at unprecedented scale, as well as the associated health, economic, environmental and social impacts of climate change.

Social license for fossil fuel projects is declining and alternative solutions to balancing energy supply and demand are accessible and cost effective.

The proposed Viva Gas Terminal will increase the emissions of the region by a significant proportion and will challenge any attempt to reach the City of Greater Geelong's 2035 emissions reduction target.

Viva's current emissions amount to 35% of the current emissions for the City of Greater Geelong and this proportion is set to increase to over 50% by 2040 with the introduction of the Gas Terminal.

Viva's EES does not properly account for the emissions associated with the project – as they exclude Scope 3 transport emissions, the largest component of emissions associated with the project.

Once transport emissions are properly accounted for, the annual emissions associated with Viva Energy's gas terminal are between 9.5 and 11.6 times higher than stated in the Viva EES.

Our analysis indicates Viva's proposed Gas Terminal Project will increase the emissions of the City of Greater Geelong by 455,010 tCO2e each year.

Climate change brings many risks and opportunities to be balanced by decision makers. The Geelong region can seize these opportunities by rapidly scaling up renewable energy industrial zones, investing in renewable energy infrastructure and generating cheaper and local energy supply.

Local community, government, business and investment leaders have an opportunity to set a pathway to zero emissions and reap the benefits of the global transition underway.

8. References

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Viva Energy Australia – Environmental Effects Statement
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Viva Energy Australia
TECHNICAL REPORT C: GREENHOUSE GAS IMPACT ASSESSMENT

Images
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