ZERO CARBON PRECINCTS STRATEGIC ASSESSMENT

Prepared by **Hansen Partnership** for the **City of Greater Geelong**
March 2023

ABBREVIATIONS

Abbreviations used within this report include the following:

- NWGGA: Northern and Western Geelong Growth Areas
- PSP: Precinct Structure Plan
- GGPS: Greater Geelong Planning Scheme
- LCA: Life Cycle Assessment
- UGZ: Urban Growth Zone
- ESD: Environmentally Sustainable Development
- GFA: Gross Floor Area
- NAC: Neighbourhood Activity Centre
- CoGG: City of Greater Geelong (the City)
- EVCP: Electric Vehicle Charging Point

CONTENTS

PART A

1.0 Introduction 3
2.0 Background 5
3.0 The Role of Precincts 7
4.0 The Standards 18
5.0 The Mechanisms 48
6.0 Recommendations 54

PART B

7.0 Background 57
8.0 Strategic Assessment 58

ISSUE	DATE
draft	*23.01.2023*
final draft following review	*31.03.2023*

1.0 INTRODUCTION

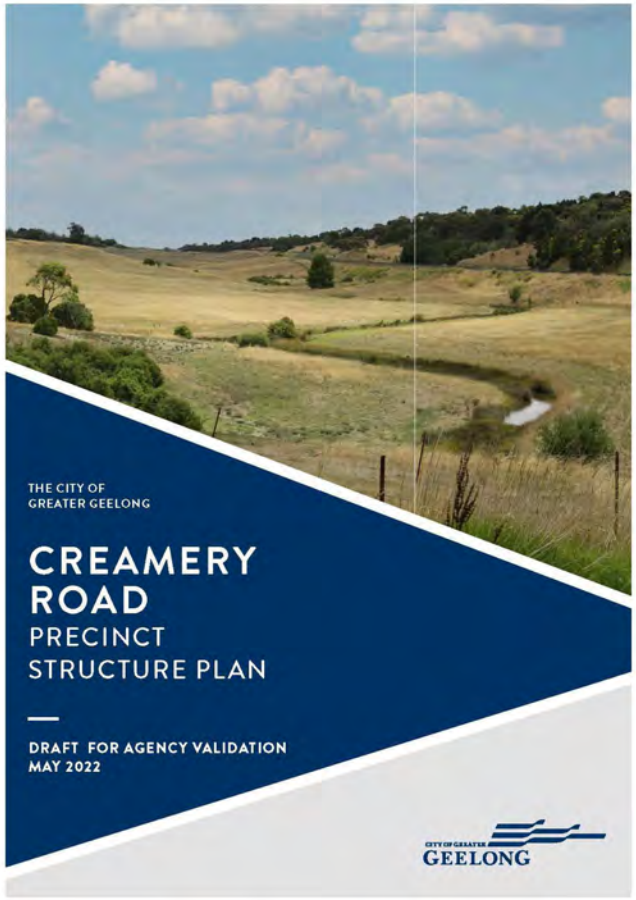
This report has been prepared by Hansen Partnership to provide an assessment of a proposed approach to delivering the City of Greater Geelong stated ambitions for net zero neighbourhoods within the Northern and Western Geelong Growth Areas (NWGGA).

A draft Precinct Structure Plan (PSP) for the first precinct (Creamery Road) within the Northern and Western Geelong Growth Areas (NWGGA) has been prepared by Council. A range of reviews are underway in finalising that report, and the proposed controls with which it will be implemented. Hansen has been engaged to specifically assess the Standards and implementation mechanisms proposed as part of that process to deliver zero carbon neighbourhoods. As such, this report addresses only matters of relevance to those zero carbon outcomes, and not broader matters pertaining to the PSP.

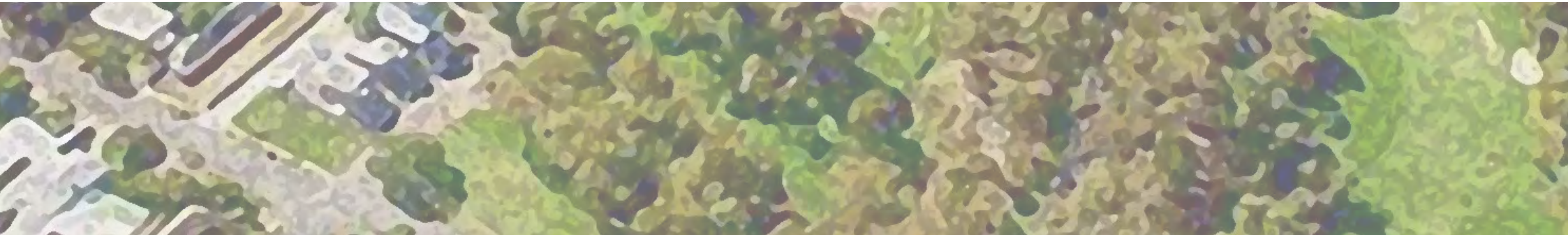
The process of this review involved the following:

- Background review of relevant documents including feedback on relevant aspects of the NWGGA Framework Plan which preceded the draft PSP
- Benchmarking of aspects of precinct development relevant to the delivery of the projects objectives
- Review of proposed standards and implementation mechanisms
- A series of ongoing meetings with Council project team to resolve relevant matters

The report is structured around two key parts. Part A addresses zero carbon precincts, exploring what contemporary best practice looks like, what is proposed through the standards and reviewing the complex assessment pathways to ensure that implementation is effective. This informs a raft of changes proposed to the draft Standards, and the report includes discussion of some of the key issues. Part A concludes with a series of recommendations. Part B of the report comprises an assessment of the zero carbon aspects of the proposed amendment against the Strategic Assessment Guidelines, as required by Ministerial Direction 11. This assessment is not an assessment of the whole for the PSP and its associated planning scheme amendment, but is confined only to those matters pertinent to the delivery of zero carbon neighbourhoods.



PART A: ZERO CARBON PRECINCT STANDARDS



2.0 BACKGROUND

The City of Greater Geelong (CoGG) has established a long term strategy to support a long term vision for the region to evolve as a 'Clever and Creative City'. This vision is underpinned by the ambition that

By 2047, Greater Geelong will be internationally recognised as a clever and creative city-region that is forward looking, enterprising and adaptive, and cares for its people and environment.

This concept has underpinned a raft of planning and engagement exercises over the past 5 years. The Vision Baseline report includes as one of the key benchmarks:

Carbon emissions – Greater Geelong being a carbon neutral city-region.

Further to this work CoGG has also adopted a *Climate Change Response Plan* to guide the City's response to emissions reduction and adaptation to climate change impacts. The Plan was developed over a 12 month period with extensive community engagement and includes a municipal wide target of:

Achieve net zero community emissions by 2035.

This Plan also included specific direction related to teh City's growth areas as follows:

Develop and implement best-practice Environmentally Sustainable Design (ESD) Plans for all new urban developments, including:

- *Geelong Northern Growth Area*
- *Geelong Western Growth Area"*

2.1 GEELONG'S GROWTH AREAS

In order to accommodate their projected future growth, CoGG identified two major growth areas – the Northern and Western Growth Areas (NWGGA). Before commencing development a Framework Plan was prepared for both growth areas, which was intended to then inform subsequent Precinct Structure Plans that would be prepared to guide development in these growth areas.

As part of the preparation for the development of this Framework Plan, CoGG commissioned some background work around the potential approach to the delivery of sustainability objectives across the growth areas (see highlight box).

To support the Framework Plan, a 'Framework Sustainability Action Plan', prepared by hip v hype, sets out the strategic opportunity for sustainability initiatives in the NWGGA area, including a suite of actions cascading from 10 themes of:

- Sustainable Water: Using water efficiently, protecting local water resources and reducing flooding and drought.
- Zero Carbon Energy: Making buildings and manufacturing energy efficient and supplying all energy with renewables.
- Local and Sustainable Food: Promoting sustainable humane farming and healthy diets in local, seasonal organic food and vegetable protein.
- Zero Waste:
- Health and Happiness: Promoting sustainable humane farming and healthy diets in local, seasonal organic food and vegetable protein.
- Sustainable Transport: Reducing the need to travel, and encouraging walking, cycling and low carbon transport.
- Material and Products: Using materials from sustainable sources and promoting products which help people reduce consumption.
- Land and Nature: Protecting and restoring land for the benefit of people and wildlife.
- Culture and Community: Nurturing local identity and heritage, empowering communities and promoting a culture of sustainable living.
- Equity and Local Economy: Creating safe, equitable places to live and work which support local prosperity and international fair trade.

The function of the Action Plan is described as "an over-arching guide to the subsequent stages of the project, ensuring the design retains a focus on the underpinning drivers". While not strictly a planning document, the Action Plan provides the impetus for the embedding of sustainable initiatives into the PSPs of the NWGGA. *(source: Deakin University ESD Toolkit draft report, pg 35)*

This work then informed the NWGGAs Framework Plan which was adopted by the City of Greater Geelong in August 2021 and is now embedded in the Greater Geelong Planning Scheme.

While separate corridors, both the Northern and Western Growth Areas share the same overarching 'urban development objective' to:

> *"Create a carbon positive community that implements ecologically sustainable development principles by prioritising renewable energy production and minimising resource use".*

Associated Actions embedded within that framework which have a direct relationship to the matters addressed by this report include:

- Action N2.3.1 Urban development will be designed to achieve a zero carbon future for the Greater Geelong city-region.
- Action W2.3.3 Energy systems will anticipate renewable supply sources through all land use types.
- Action W2.3.4 Neighbourhoods will be designed to enable adoption of future, cleaner technologies
- Action W2.4.7 Housing will be encouraged to incorporate ESD principles in the design to deliver carbon neutral communities.
- Action W2.3.2 Neighbourhood layout and orientation will reduce energy consumption and create comfortable buildings and resilient communities

Deakin University ESD Toolkit

As CoGG began to develop their Precinct Structure Plans (PSPs) further explorations of how these growth area ambitions could be delivered at precinct scale were undertaken. Work commissioned for the precinct by Deakin University (and their sub-consultants, Urbis) provided an overview of environmentally sustainable design (ESD) actions for consideration in CoGG's Precinct Structure Plans, linking these to the strategies embedded in the NWGGA Framework Plan.

A GIS based Dynamic Scenario Planning Model (DSPM) was developed by Deakin University as a 'digital twin' with the intention to allow for the modelling of impact different potential actions or interventions may have on the precinct's delivery of zero carbon / carbon neutral & ESD objectives. It must be acknowledged that the scope of this work was much broader then the concept of zero carbon / carbon neutral and so addressed other matters not referenced with in this report.

This work was arranged thematically (noting these themes have not been continued given the differences between these and the PSP structure). For each of the themes, where relevant, the ESD actions are accompanied by metrics and rating tools which *"will enable developers and Council officers to consider applications against contemporary benchmarks".*

The report proposed that for each PSP an ESD Action Plan be prepared, however, this has not been pursued and instead ESD outcomes are being integrated in the broader thinking for the precincts, a sensible approach given the need to embed ESD outcomes across all aspects on the PSP.

3.0 THE ROLE OF PRECINCTS

Precinct planning is an exercise which sets in place the conditions under which defined areas will grow and develop over decades. While precinct planning can apply equally to brownfield areas or activity centres, the most common form of precinct planning in Victoria is 'greenfield' where areas previously used for rural purposes transition to fully urbanised new suburbs.

The way this planning is undertaken in Victoria has been reasonably well established through work undertaken by the Victorian Planning Authority (VPA) and its predecessors the Metropolitan Planning Authority and the Growth Areas Authority. While work being undertaken by the CoGG is not being driven by the VPA, nonetheless the process and framework within which this work is being undertaken and will be implemented are likely to be similar.

There are differing views as to the scope of what should be addressed by precinct scale plans, and this chapter explores some of the areas of tension and the opportunities.

3.1 PRECINCT PLANNING IN VICTORIA

The standard planning process for greenfield areas such as the NWGGA is:

- Preparation of a Precinct Structure Plan in collaboration with key stakeholders and landowners, guided by the Precinct Structure Planning Guidelines (*Precinct Structure Planning Guidelines: New Communities in Victoria.* 2021) prepared by the VPA.
- Application of an Urban Growth Zone (UGZ) to the land subject to the PSP which is in private ownership.
- Insertion of the PSP for the area as an Incorporated Document within the Planning Scheme.
- Subdivision and development within that area is then expected to be 'generally in accordance' with the content of that PSP
- A schedule to the UGZ will outline the 'applied zones' (and therefore associated considerations for any application) as well as any specific Application Requirements etc

Precinct planning generally triggers permits for subdivision under Clause 56 of the Geelong Planning Scheme which contains limited ESD or climate change related content and CoGG's planning policy on ESD explicitly excludes subdivisions.

Legislation such as Victoria's *Subdivisions Act* also plays a role in the development of precincts, in addition to the *Planning & Environment Act*.

It's also worth noting that the Victorian Planning Authority has also developed a Small Lot Housing Code. This that, in an area for which a PSP has been incorporated / UGZ applied, that for housing proposed on lots of less than 300sqm a permit is not required providing a series of mandated requirements are met. There is no discretion, but the use of the Code is not mandatory. The current Code does not address ESD in any meaningful way and imposes no requirements regarding climate change responses.

3.2 OPPORTUNITIES

Precinct planning essentially 'locks in' the framework for future development and, while the framing of implementation requirement around the need to be 'generally in accordance with' the content of any PSP. In practice, this means that any changes following gazettal rarely require additional inputs or investment from applicants that could be considered onerous, beyond what has been included in any incorporated PSP.

There are a number of reports which have been produced recently (for example by C40 cities alliance and the Green Building Council of Australia) that have looked specifically at precincts and the opportunities inherent in planning at this scale.

A common thread is that the delivery of zero carbon neighbourhoods (within the broader ambition of climate responsive neighbourhoods) has the potential to also lead to much greater levels of liveability and wellbeing for residents of these precincts.

This section of the report reviews matters assessed at precinct scale within these varying reports to establish contemporary benchmarks against which the scope and content of the proposed standards can be considered.

It should be noted that in many documents the terms 'neighbourhood' and 'precinct' are used interchangeably.

Decorbonisation of Buildings (World Economic Forum)

Recent reports for the World Economic Forum (*Accelerating the Decarbonization of Buildings: The Net-Zero Carbon Cities Building Value Framework, Jan 2022*) have also highlighted the important role that the 'ecosystem' developed for a city (or precinct) can play. This includes key messages such as: *"investing in city ecosystem services and equipping buildings with distributed renewable power generation, storage and smart energy management solutions can enhance local resilience and accelerate decarbonization across cities without the need for disruptive grid upgrades."*

The economic importance of ensuring that decarbonisation is addressed across all scales is highlighted. In the local context, the structure of our planning framework makes it critical that these issues are embedded at PSP stage, in order to inform subdivision and subsequent lot scale outcomes.

Figure 1: net zero buildings - WEF checklist

Green and Thriving Neighbourhoods: A pathway to net zero, featuring the '15-minute city' (C40 Cities / Arup 2021)

Of the work undertaken by C40 and Arup, the most relevant of the 2 Pillars to this work is:

> *Pillar 1 Green: net zero emissions A green and thriving neighbourhood will aim to minimise emissions throughout the project lifecycle and achieve net zero by counteracting any residual emissions in a robust and transparent way.*

The C40 & Arup work considers neighbourhood scale emissions in three categories: operational, embodied and consumption-based emissions. The work recommends that neighbourhoods should aim to achieve net zero operational and embodied emissions, while taking ambitious action on consumption-based emissions. While the report acknowledges that achieving net zero emissions will take time the adoption of near-term targets to drive rapid emissions reduction now is recommended.

While this work sets up a framework under which all emissions from each neighbourhood is measured and offset as required, there are a number of challenges to implementing this in the contemporary context of Geelong's growth areas.

However, while the current PSP is unlikely to be able to implement the optimal approach, nonetheless is it important to understand the current proposed standards in the context of what should be longer term ambitions for the precincts. This will allow the current PSP and associated amendment to set in place the base conditions to deliver best practice in net zero neighbourhoods over the coming decades.

Precincts have been widely acknowledged as the scale of planning which represents one of the key opportunities for delivering meaningful change and reimagining what and how our urban areas could and should look like in response to climate change.

The first set of emissions associated with precincts can generally be characterised as 'operational'. Key areas where precincts have the potential to deliver net zero outcomes related to operational emissions include through the following:

- Energy efficiency
- Urban forms that support walkability and reduce transport emissions
- Fossil fuel free (i.e. no gas)
- Powered by renewable energy sources, including on-site generation and storage and off-site purchase.

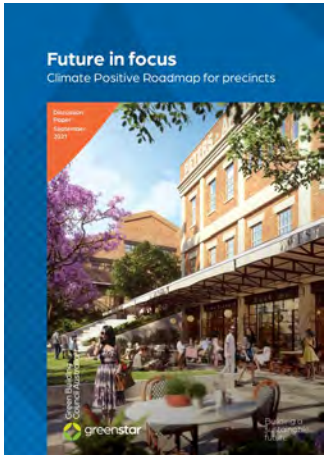
The longer term ambitions referenced above should seek to establish a robust framework for measuring the ongoing emissions associated with energy used in buildings, public spaces and transportation, or emissions arising from processing waste that can be attributed to the precinct. The C40 / Arup recommendation is that *"Annual operational emissions should be calculated using the Global Protocol for Community-Scale GHG Emissions (GPC) standard using the BASIC reporting level to capture Scope 1 and 2 emissions from stationary energy and transportation, as well as Scope 1 and 3 emissions from waste. The standardised GPC methods can be used to fill data gaps where necessary."*

This ongoing measurement and monitoring is supported as an ambition for delivering net zero neighbourhoods in line with CoGGs stated ambitions. However, the attribution of these emissions to developers at the stages subject to consideration through this amendment is less clear cut and is discussed in more detail through this report.

The second key area where precinct's emissions need to be considered is 'embodied' emissions, where the potential to contribute to net zero is primarily linked to the use of low or zero carbon materials for construction in the precinct. Embodied emissions relate to material extraction, manufacturing, assembly, maintenance, repairs, replacements, deconstruction, demolition and any associated transport, waste and end of life impacts (often referred to as a 'whole of lifecycle' assessment). Recommendations are generally that a neighbourhood seeking to achieve net zero should establish a process for recruiting lifecycle assessments during construction phases, and to set benchmarks for reductions. While the setting of reductions against 'business-as-usual' is strongly supported and should be the ambition for the precinct in the longer term, there are a number of issues with the measurement and subsequent assessment, as well as some other issues which also need to be considered in apply controls in the current content. These are discussed further below.

Precincts are also associated with *"Consumption based emissions",* which could potentially be reduced through approaches such as localised food production, but these are beyond the scope considered. Planning is not considered to have any linkage to the consumption choices of individual residents within a precinct. This report also does not address the offsetting of any residential emissions for reasons outlined at Section 3.3. However, the opportunity to compensate for any other emissions associated with precincts or neighbourhoods through the introduction of urban green infrastructure (which can assist with the mitigation of emissions) is noted.

Climate Positive Precincts (Green Building Council of Australia, 2021)



The GBCA has been working on the development of a Roadmap for Climate Positive precincts. While this work is ongoing they have released a Discussion Paper on the issues which offers useful insights. For reference the Discussion paper provides a useful definition of a precinct as *"A unified area of urban land with a clearly defined geographic boundary. Synonymous with neighbourhood or district" which is drawn from the CRC's work on low carbon precincts.*

The Discussion Paper reiterated that Precincts are a fundamental building block of the built environment and that they should be developed and operated to eliminate emissions in line with a 1.5^{o}C target as outlined in the Paris Climate Change Agreement.

The GBCA has then identified what this means for precincts overtime, including targets. In considering the 'roadmap' needed to align with the Paris Agreement (noting this is a longer timeframe for carbon neutrality than CoGGs commitment of net zero by 2035), for new or in-development precincts the following should apply:

All precinct developments must be fossil fuel-free and get all energy from renewable energy sources. They must also have reduced upfront carbon and other emissions in their development.

The following are proposed as key (relevant) steps in achieving that (see also Figure 2)

Precincts:

- Are built using materials with significantly lower upfront carbon emissions and be committed to reduce whole of life carbon impacts from future construction, maintenance, and repairs.
- Ensure all buildings and infrastructure are energy efficient or become energy efficient over time. Precincts should also explore how they can introduce solutions to help decarbonise the grid.
- Reduce transport emissions through good urban design and transport planning, promotion of active transport, and low carbon transport options.
- Deliver 100% renewable energy into all buildings and infrastructure.
- Provide, or promote the use of, 100% on-site or off-site renewable energy for all occupants and uses in the precinct.
- Ensure any emissions remaining are compensated through nature-based carbon offsets.

What this means in the context of Creamery Road can be summarised as:

- The materials for the construction of the precinct have low carbon impact in their production.
- The precinct sets clear emissions reduction targets
- Precinct wide energy, water, and waste systems encourage a circular economy that improves efficiency.
- The urban fabric and public realm, including the street network and open space, is accessible, attractive, and safe.
- The precinct encourages walking and cycling instead of vehicle use for short trips.
- Fast and frequent public transport is available and low or zero carbon, while promotion of zero carbon private vehicles occurs for long trips.
- All assets using stationary energy are fossil fuel-free (i.e., no natural gas).
- Buildings, open space (including playing fields, plazas, and streetscapes) and infrastructure do not use fossil fuel for energy. This means no fossil fuels for buildings or infrastructure related to heating, cooking, and hot water.
- The precinct also supports and encourages fossil fuel free transport.
- All stationary energy comes from renewable energy generation including solar PV, wind and/or hydro power. This may be generated onsite or procured from renewable offsite sources. When on-site sources are used, it should be paired with energy storage solutions.
- Remaining emissions are offset through nature-based solutions that prioritise positive biodiversity outcomes.

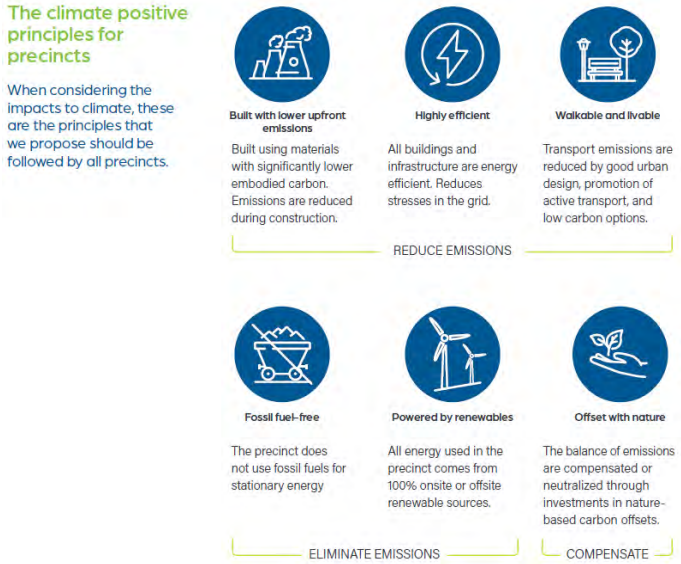


Figure 2: GBCA climate positive principles

Sustainable Subdivision Framework (CASBE)

This program, initiated by CASBE, sought to recognise the importance of looking at ESD (including matters relating to achieving net zero) not just at building scale. To effectively and efficiently deliver lot scale outcomes, particularly where significant quantities of anticipated development is likely to be single dwellings , embedding outcomes at this scale is critical. Or in the words of CASBE:

> *The creation of a subdivision is the creation of a community. It commences with a relatively blank canvas, setting up the life of the community that will extend over hundreds of years. The initial subdivision design presents an enormous opportunity to get the fundamentals right.*
>
> *The long-term nature of subdivision planning is set against the backdrop of our climate fundamentally changing. By 2070, for example, temperature increases of between 1.5 and 3 degrees are expected. It is therefore critical to take a long-term view and consider the impact of climate change over the entire life of the subdivision.*
>
> *Sustainable subdivisions are carefully planned to achieve improved quality of life, protect and use resources efficiently and improve the health of the environment and people. Crucially, sustainability needs to be embedded from the beginning of the subdivision process.*

On completion of the first stage of the trial of CASBEs framework a number of key challenges were identified:

- Internal resources and capacity
- A lack of clarity regarding application requirements
- The voluntary nature of the framework and its objectives and standards

While CoGG has recognised and identified additional resources required to facilitate preferred outcomes n the NWGGA, the other two items can provide learnings for the delivery of net zero across this precinct.

The SSF contains a number of objectives which the achievement of a zero carbon neighbourhood including those identified below. Again, it is important to note that there are a number of other relevant objectives which relate to other aspects of subdivision design with will certainly also make a contribution to a climate resilient and carbon positive neighbourhood, but which are not the main focus of this report.

Energy

- Objective 2 To reduce stationary energy related emissions
- Objective 4 To avoid the extension of gas networks.
- Objective 6 To maximise the provision of renewable energy to the subdivision

Site Layout and Liveability

- Objective 6 To provide good solar orientation of lots and solar access for future dwellings
- Objective 14 To provide for transition to new transport modes (electric vehicles, electric scooters etc.)

Circular Economy

- Objective 1 To use products with high recycled content and end of life recyclability in the construction of subdivisions.
- Objective 5 To encourage the selection of materials with low embodied carbon in the construction of subdivisions.

Notably, the Creamery Road PSP has been structured to align with this framework, indicating the City's commitment to these outcomes.

Victorian Planning Authority precedents

It is also noted that the VPA has completed some work in this space, particular in the preparation of the Arden Urban Renewal Precinct, on which they collaborated with the City of Melbourne. While there is a stated objective that buildings should support net zero emissions by 2040, the pathway with which this is to be achieved via the drafted policy is unclear. There are no specified requirement and the only buildings to which any energy efficiency and zero carbon outcomes are sought are for those over 5000sqm. Furthermore, the requirement to "consider as relevant" seems incongruous with a direction for the building being capable of being 'certified' as meeting a Green Star rating.

Objectives

- To ensure buildings in Arden achieve high environmental performance standards at the design, construction and operation phases to support net zero emissions by 2040.
- To support sustainable and resilient urban transformation and creation of a climate adept, water sensitive, low carbon, low waste community.
- To minimise waste production, optimise reuse and recycling and encourage a circular economy in Arden.

Strategies and guidelines in place to support these objectives include:

- Supporting landscaping / materials that reduce the impact of the urban heat island effect. This includes a guideline that 75% site area should be building or landscape elements that reduce the impact of the urban heat island effect. Another guideline promotes reflective façade material (*noting this may cause off-site impacts - glare)*
- Ensuring development has regard to any future precinct-scale waste infrastructure
- Encouraging the use of recycled or reusable materials
- New buildings or works over 5000sqm should consider design, construction and certification as 6 star Green Star
- Guideline that at least 40% of the total site area should be green cover and green facades, rooftop, podium or terrace planting that are water efficient, located and designed to be sustainable, viable and resilient.

Climate Active

Climate Active is an ongoing partnership between the Australian Government and Australian businesses to drive voluntary climate action. It provides a documented pathway to achieving carbon neutrality for organisations, building events and precincts among others. It sets out a process for how to measure, reduce, and offset carbon emissions under a range of themes and allows for formal certification of the carbon neutral status via the Climate Active Carbon Neutral Standard for Precincts. While the standard provides a clear set of principles that should underpin any accounting of emissions and steps in the process of assessing emissions and then proceeding to carbon neutrality, it also sets out the aspects of a precinct that should be considered. Importantly though, the Standard is designed to only be used for precinct operations (i.e. for emissions associated with the precincts operations). It specifically does not address embodied emissions.

Under the climate active definition of carbon neutral all relevant emissions sources generated from the day-to-day running of the precinct must be considered. This would include:

- Emissions from stationary energy (lighting, heating and cooling, occupant energy use, plant equipment, other infrastructure and shared services)
- Emissions from transport (property management vehicles, forklifts, shuttle services),
- Upstream and downstream emissions from resource consumption and waste generation (waste, water and wastewater).

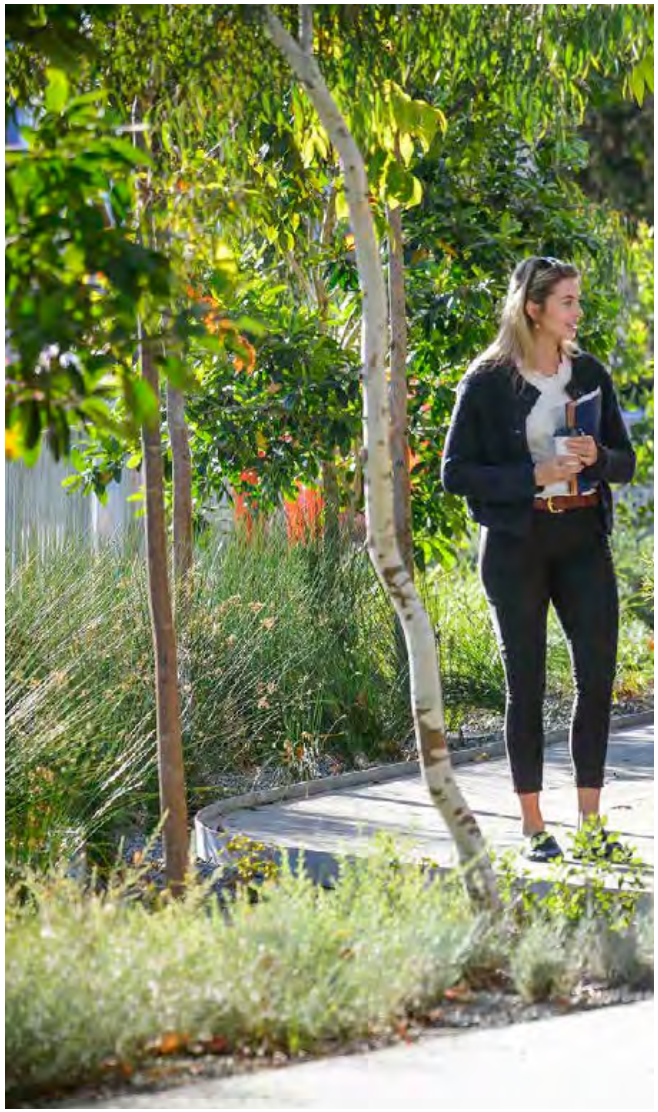
In the case of CoGG and the proposed standards, the focus is likely to be on the first dot point. Transport emissions are challenging to attribute and control through the issues of a subdivision permit (which is the primary permit trigger where a PSP applies) as there is limited understanding or control over the choice of private vehicles or the fuel sources of public transport by the applicant. While the last dot point is also an important consideration, in this context, the carbon neutrality of water is addressed by a current commitment to zero carbon by the relevant water authority (Barwon Water). The carbon emissions associated with waste is also being managed at a scale larger than a building or subdivision, or even a precinct, through CoGGs municipal wide strategy. As such, it would be anticipated that any relevant matters relating to the achievement of zero carbon associated with waste would be integrated via other channels or permit conditions imposed by the council.

The approach proposed by Climate Active to carbon neutrality involves:

- Reducing demand through energy efficiency
- Pursuing on-site renewable generation
- Purchasing off-site renewable energy

The standard includes the use of offsets as per general standards applied to achieving zero carbon (efficiency improvement – on-site generation – off-site renewables – offsets), The approach proposed by this review is that electrification, and the associated use of renewable for that electricity is the priority. This is in line with recent reports indicating that electrification is the most efficient path to zero emissions (see *Rapid and Least Cost Decarbonisation of Building Operations*, ASBEC 2022). As a result of that, the use of offsets, unless they were for embodied or transport emissions, would not be required.

This certification has the potential to be applied to a subdivision (which would fit the definition of a precinct under the Climate Active definition) and should therefore be considered as an appropriate pathway for approval as part of the proposed approach outlined later in this report (i.e. a certification under this scheme would be considered to satisfy the requirements outlined in relation to Net Zero Operational Energy).



Summary

To summarise what contemporary best practice seeks to look to in achieving net zero precincts, the following are considered to be of most relevance to the precinct planning currently underway in the CoGG:

1. Setting an overarching ambition for carbon neutrality
2. Establishment of sustainable urban structure, such as 20 minute neighbourhoods
3. Urban forms which support 'streets for people' / 'complete streets'
4. Avoiding fossil fuel use
5. Requiring provision of renewable generation and management of energy loads
6. Ensuring all energy sources are renewable
7. Increasing energy efficiency
8. Supporting sustainable and zero emission transport
9. Using materials with lower or no embodied carbon
10. Zero waste and circular economy outcomes to avoid emissions from waste production
11. Eliminating emissions associated with provision of services such as water and sewerage

The approach proposed in relation to these is as follows, with further explanation of the rationale for inclusion or exclusion explored more fully in the following section of the report. As a result, only some of these are reviewed in more detail in this report. Items 2 and 3 in particular are not addressed directly. The reason for this is that they are embedded in much of the existing planning policy and directions at both state and local government for a range of reasons, not merely their contribution to zero carbon outcomes.

The content of the PSP as relates to those items has been reviewed and is considered to be appropriate in response to the delivery of net zero outcomes (i.e a focus on pedestrian friendly streets, urban structure which support 20 minute neighbourhood etc). The following is a summary of recommendations regarding the scope of the standards to be encapsulated with within the 'zero carbon' aspirations for the Creamery Road PSP. Those addressed directly by this report are highlighted by green dots:

- Setting an overarching ambition for net zero
  To be integrated into precinct objectives
- Establishment of sustainable urban structure, such as 20 minute neighbourhoods
  Recommended, embedded in the current draft PSP, but not addressed directly by this report
- Urban forms which 'streets for people' / 'complete streets'
  Recommended, embedded in the current draft PSP, but not addressed directly by this report
- Avoiding fossil fuel use
  Recommended to be pursued through the PSP
- Requiring provision of renewable generation and management of energy loads
  Recommended to be pursued through the PSP
- Ensuring energy sources are renewable
  Recommended to be pursued through the PSP
- Increasing energy efficiency
  Recommended to be pursued through the PSP
- Supporting sustainable and zero emission transport
  Recommended, partly embedded in the current draft PSP, partly addressed by this report
- Using materials with lower or no embodied carbon
  Recommended but at a higher level than proposed
- Zero waste and circular economy outcomes to avoid emissions from waste production
  Considered as it relates to construction waste/ emissions and embodied carbon but also being pursued at a municipal and state level, with lot scale updates anticipated through proposed changes to state and local provisions.
- Eliminating emissions associated with provision of services such as water and sewerage
  Not addressed as being pursued via Water Authority obligations.

3.3 TENSIONS & CHALLENGES

In seeking to apply some of the best practice approaches to net zero precincts through the Victoria Planning Provisions a number of tensions emerge. These are discussed briefly in this section of the report.

The 'nexus'

One of the key matters that planning in Victoria concerns itself with is the concept of a 'nexus' between what is being required or considered through any planning control and the stage and type of development that is triggering a planning permit. This is perhaps most commonly understood in the allocation of development contributions, but applies more broadly. In looking at the standards proposed in the PSP, and associated controls, it will be important to ensure that the proposed stage at which the various requirements are triggered is clearly linked to the ability of the applicant to address those matters at that stage. The standards must also relate clearly to the change being facilitated via the permit.

Subdivision vs development

As discussed above, the most common tool to control development in greenfield growth areas under current practice is the Urban Growth Zone. A challenge that emerges through the use of this control is that it allows for both subdivision and also development. This means that there are very different 'scales' of development that can be contemplated and will need to be assessed. This has obvious implications for how any standards are drafted, as what may be reasonable to require at subdivision stage may not be reasonable for an individual development, but conversely, there is a risk in not providing controls relating to development that the overarching outcomes required to deliver a net zero neighbourhood may be undermined. Considering the ways in which a precinct is delivered and evolves over time and by a range of different actors will be important in seeking the right balance of controls at planning stages for the precinct. In addition, much of the current relating to ESD relates specifically to building design, rather than subdivision, with the CoGG's ESD policy being a clear example of this.

Role of planning

This issue arises primarily in relation to embodied carbon, although also some other areas. There is yet to be a precedent for requirements for a LCA, and there is some debate about the role of the planning system (vs the building system) in setting out requirements relating to materials. This remains an ongoing debate. There is some indication that in the future we may see 'caps' on embodied carbon integrated into building standards as a per sqm requirement, but measurement systems for embodied carbon are still being finished (see discussion below). However, planning has typically and traditionally concerned itself with materials via requirements for Materials & Finishes schedule which is typically required for development applications. Given that materials are clearly a consideration in the appropriateness of a development, ensuring that these have been selected via a process which has considered their impact on the delivery of a carbon neutral neighbourhood has logic. In addition, the use of a Life Cycle Assessment may include considerations beyond just the material type or its safety, such as typically addressed via building regulations.

Measurable & Assessable

In order for the proposed standards to be applied, it is necessary to ensure that they are measurable and can be assessed without placing undue strain on council resources, nor unreasonable burdens in any applicants. One of the challenges in considering zero carbon standards is that many of the framework and measurement tools needed to do this have not yet been developed or implemented. Where tools do exist, in many cases they may not be 'fit-for-purpose' in the context of Victoria's planning system or at a precinct / subdivision scale. It will be important that any standards are requirements embedded in the PSP and associated planning controls have had careful consideration for the assessment pathway under which they will be considered. Alongside this, the metrics and tools that can help improve the efficiency of nay assessment should also be considered.

The National Carbon Offset Standard and Carbon Neutral Program were launched by the Australian Government in 2010 to provide a credible framework for managing emissions and achieving carbon neutrality. The initiative was rebranded under the Climate Active name in 2019 (see discussion in earlier section). Logically any measurement at a precinct scale should align with any National standard. However, while this provides a framework within which emissions can be measured it does not provide specific direction on which aspects of the carbon emissions associated with any precinct should be considered at which stage or the actor to which the costs of neutralising these offsets should be assigned.

Fit for purpose tools (rating tools)

Measurement tools are evolving significantly and so there needs to be recognition that these may evolve over time. Ensuring that the 'hook' is provided within planning policy developed for the area in order to 'ramp up' the outcomes and requirements for developers over time. This means referencing specific tools needs to be carefully considered, and clarity around what is considered 'equivalent', should that approach be taken is needed.

Effective use of tools can provide consistency in demonstrating performance and can reduce administrative burden by facilitating streamlined assessment of permit applications. Effective use of tools can offer significant support but only if the key parameters for using those tools is clear, and the 'right fit' tools are identified which align with the requirements embedded in the planning scheme. In a context such as this where the scale and type of applications for which permit may be triggered is variable this is even more important.

While earlier work for the delivery of zero carbon and ESD outcomes within the growth areas, explored the use of a various range of potential tools and / or specific credit with these tools, the 'mix and match' approach to credits from various tools and the use of different aspects of different tools may be appropriate to satisfy the requirements of the scheme for the majority of the standards and so specific tools are not identified in the majority of cases. Additional guidance as to appropriate tools to meet planning requirements (rather than identification of these within statutory controls) may be useful.

So, while there are numerous tools available out there, and many of these will be critical in supporting any assessment process. It is not proposed to specifically identify tools within planning policy. There are a number of reasons for this:

- The tools proposed in some background work, in many cases are not a perfect fit for the proposed requirements of this PSP and identifying these specifically runs the risk of the misalignment driving unintended outcomes.
- The breadth of applications that council can conceivably need to assess under the proposed control mean the appraise tools may vary widely (i.e. a new school vs a four lot subdivision vs a 'precinct' scale multi building application in the NAC). The appropriate tools will also need to vary.
- The complexity of assessment, and therefore the appropriate tool, may also differ significantly depending on the approach proposed by any applicant. For example, if the applicant choses to pursue a Carbon Active certification for a 'precinct', then more fine grained tools to assess specific aspects of any application may not be required.

CoGG has demonstrated a strong understanding of the tools available to their officers to assess applications, and further guidance material for both staff and applicants on the coverage, pros and cons of the various tools available may be useful – this could assist in establishing the appropriate tools to demonstrate compliance with requirement of the GGPS.

The biggest challenge

Generally the ability to address operational energy outputs at subdivision stage has been framed around 'reduction' of emissions as opposed to 'elimination' which is inconsistent with CoGGs 2035 ambition for net zero community emissions. Similarly, most related strategies or requirements have typically been framed or considered as optional or 'nice to have' 'add-ons'. It must be recognised however that the current context has changed significantly from when existing precedents or defining decisions were made. In addition, to a significantly different global context in relation to climate change, and increasing urgent calls from the IPCC regarding the need to urgent slash emissions, the planning context has now also changed significantly. The Objectives of the Planning and Environment Act under which (most) planning in Victoria is enacted, either directly or indirectly, seeks to:

(a) to provide for the fair, orderly, economic and sustainable use, and development of land;

(b) to provide for the protection of natural and man-made resources and the maintenance of ecological processes and genetic diversity;

(c) to secure a pleasant, efficient and safe working, living and recreational environment for all Victorians and visitors to Victoria;

(d) to conserve and enhance those buildings, areas or other places which are of scientific, aesthetic, architectural or historical interest, or otherwise of special cultural value;

(e) to protect public utilities and other assets and enable the orderly provision and co-ordination of public utilities and other facilities for the benefit of the community;

EXAMPLES OF RATING TOOLS

- IS Rating Tool V2.1 Design / As Built – The IS Rating Tool V2.1 can be used in part or whole to rate the sustainability of infrastructure works. The rating tool is administered by the Infrastructure Sustainability Council of Australia.
- Green Star Communities V1.1 Tool – The Green Star Communities V1.1 Tool is used to rate large scale development projects, at a precinct, neighbourhood and / or community scale.
- Green Star Buildings Version 1 – The Green Star Buildings V1 tool rates any new building or a major refurbishment, with the exclusion of a single dwelling home (NCC Class 1), a parking garage, or an uninhabited structure. Any building that is not a single dwelling home (NCC Class 1), a parking garage above 500m2 of floor area must obtain a certified Green tar Buildings rating V1.1 of 5 Stars for both design and as built.
- Green Star Homes Version 1 – The Green Star Homes V1 tool is a sustainability Standard for assessing and rating individual houses based on standard designs and delivered by volume home builders. Any development of class 1 homes that meets the eligibility criteria must obtain Green Star Homes V1 certification at both design and as built rating.
- Built Environment Sustainability Scorecard (BESS) – This is an online sustainability tool used at planning level. Some individual credits from BESS have been used
- National Construction Code – The National Construction Code Part J Energy Efficiency section has been referenced in this ESD toolkit.
- Climate Active Precinct certification.
- Passivehaus certification – not reference in current toolkit but growing as a certification that demonstrates a highly energy efficient development (across residential commercial and institutional typologies).
- NatHERS - Nationwide House Energy Rating Scheme which provides energy ratings for new dwellings
- NABERS - is a sustainability measurement too which can be applied across building sectors like hotels, shopping centres, apartments, offices, data centres etc. It also assesses the ongoing performance of rated buildings.
- WELL - a performance based system with more focus on human health benefits of buildings with excellent ESD

(f) to facilitate development in accordance with the objectives set out in paragraphs (a), (b), (c), (d) and (e);

(fa) to facilitate the provision of affordable housing in Victoria;

(g) to balance the present and future interests of all Victorians. (emphasis added)

Presumably in recognition that many of these objectives simply cannot be achieved unless climate change is addressed in a very real and serious manner, recent updates to the Purpose of Victoria's planning scheme (VC216 Sept 2022) now includes "to support responses to climate change". Other recent changes have begun to move incrementally towards supporting zero carbon / carbon neutral outcomes, such as AmVC221 which removed requirements for gas connections. While there may be differing views as to the degree to which zero carbon / carbon neutral outcomes at a precinct scale could, or should, contribute to that support, there is no doubt that the policy context has changed and that there is increasing recognition that the greatest challenge we face is tackling climate change.

4.0 THE STANDARDS

4.1 THE PRECINCT STRUCTURE PLAN

The Creamery Road PSP follows reasonably closely a 'standard' PSP structure. Matters relating to carbon neutrality are generally found within two sections:

- Overarching vision and objectives
- Thematic Objectives and Requirements / Guidelines

The PSP is proposed to be included within the planning scheme as an Incorporated Document at Clause 72.04, which is appropriate.

This Section of the report addresses the Objectives contained within the PSP, and provides associated recommendations, as well as a detailed assessment of the draft Standards provided and a rationale for changes to those drafted, where a change is recommended.

4.2 DEFINING 'ZERO CARBON'

There remains no State (or Federal) definition of what zero carbon / carbon neutral means in the context of planning, and in particular, planning for precincts. While the concept of 'net zero' is reasonably widely understood and the components to get there are well established (see Figure 3), what aspects of the systems and forms planning intersects with and how these should be measured and considered at a precinct scale is yet to be defined. Does 'net zero' at a precinct scale include embodied carbon? Existing buildings? How do we assign emissions from transport that may have a limited relationship to the decision made through planning?

In the case of the City of Greater Geelong the various background documents and strategies include a variety of definitions (outlined below), but many of these lack specific direction as to what should be measurable within their scope:

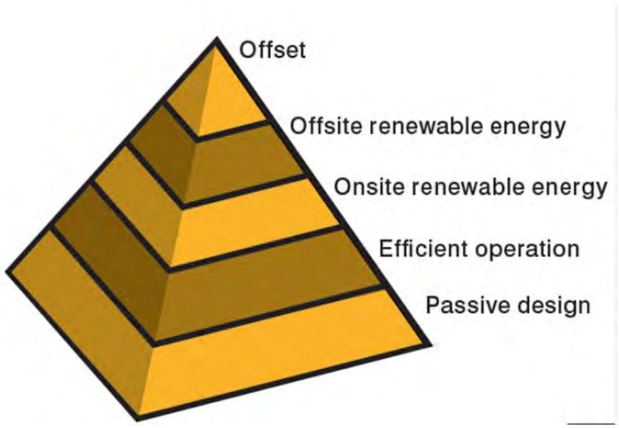


Figure 3: zero emissions hierarchy, source: Yarra City Council

Council Plan/s

Environment Strategy 2020-2030

Goal 1: Become a zero-emission, climate-ready city and region

Mitigation Target: net zero community emissions by 2035 is the stated ambitions, Typically, in a Local Government context this means emissions beyond those just associated with council owned and managed buildings, vehicles and infrastructure. The urban environments that council facilitate through their planning processes obviously exert a strong influence on the achievement of net zero community emissions into the future. In most cases these 'community emissions' far outweigh direct emissions by Councils.

NWGGA Framework Plan:

Includes objectives to deliver a "carbon positive" community which includes specific reference to renewable energy use and reduced resource use. This is the only mention of a 'carbon positive' as opposed to 'net zero' outcome, with the implication being that the precincts (or the broader growth area as a whole) will not only be net zero, but will also contribute to the drawing down on carbon in order to provide a 'carbon positive' outcome. This is not addressed specifically by this project, but it is noted that as a longer term ambition, if net zero operational energy is achieved, transport patterns are based around net zero public transport, EVs and active transport, a circular economy is established and embodied carbon is reduced significantly, then the proposed green spaces, canopy plantings and other green infrastructure have the potential to deliver this ambition. It is not a phrase proposed for use at this stage.

Action N2.3.1 references *"a zero carbon future for the Greater Geelong city-region"*

The Northern and Western Geelong Growth Areas Framework Plan also includes a requirement that all Precinct Structure Plans within the Northern and Western Geelong Growth Areas include an Environmentally Sustainable Design (ESD) Action Plan, which demonstrates the actions that urban development within the Precinct to *deliver zero carbon outcomes* and environmentally sustainable development (ESD).

Greater Geelong Planning Scheme

Planning Scheme Amendment C395 introduced the following strategy into the Greater Geelong Planning Scheme at Clause 11.02.2L (Northern and Western Geelong Growth Areas):

"Ensure urban development delivers carbon neutral neighbourhoods".

Draft Precinct Structure Plan

And finally, the draft Creamery Road PSP includes the following references:

- develop zero carbon and zero waste communities;
- achieve and maintain a net zero carbon footprint
- zero carbon subdivision and development
- zero carbon and climate resilient community
- achieving a zero carbon precinct.
- a net zero carbon footprint

While it is not recommended to all content within the PSP be changed (given existing references to 'net zero' or to 'zero carbon', it is recommended in the context of any future controls to be embedded in the Geelong Planning Scheme that the phrases **carbon neutral neighbourhood** (objective) or **carbon neutral precinct** (spatial) be used in order to ensure consistency in references through relevant planning tools.

It is also important to recognise a subtle distinction in terminology between 'net zero', 'carbon neutral' and 'zero emission' outcomes. While 'carbon neutral' is recommended as it is consistent with the existing planning controls, the focus should remain on the delivery of precincts which do not generate any emissions (i.e have "zero emissions") rather than on the delivery of 'net zero' outcomes through the use of offsets. In other words, the focus should remain with the overarching ambition from the Council Vision, with reliance on offsets to deliver a 'net zero' outcome being of lesser relevance.

References to 'net zero' and 'zero carbon' must also be considered in light of the issues identified above with the immediate achievement of this ambitions as relevant the ability to measure, and therefore offset, the emissions associated with this precinct across all aspects of the 'net zero' picture, which could include matter relating to transport and / or embodied carbon, depending on the definition adopted.

Consideration should be given to providing a clear indication of what zero carbon / carbon neutral means as it is expressed in the PSP within the Definition section of the PSP document.

CLARIFICATION / DEFINITION (for consideration)

Net zero (zero carbon / carbon neutral) clarification for the Creamery Road PSP:

In the context of the immediate application of controls to Creamery Road via the Urban Growth Zone, the following outlines expectations in regard to the delivery of a net zero outcomes for the precinct:

The delivery of an urban structure and built environment which avoids additional greenhouse gas emissions to the greatest extent practicable. This means no new greenhouse gas emissions are generated as part of the operation of buildings within the precinct. It also means that the urban structure and built environment support an ongoing reduction in transport, waste and other emissions. Net zero also includes a reduction in embodied emissions to the greatest extent practicable, which is expected to increase over time.

Staging of carbon neutral ambitions

Challenges in defining carbon neutrality do not mean the overarching ambition of achieving carbon neutral neighbourhoods should not remain. Nor do these challenges means that the PSP (and the associated planning tools) should not retain the achievement of a comprehensive net zero goal by 2035 as their objective, in line with the endorsed Council ambition. But the mechanisms currently available to achieve carbon neutrality across all aspects mean a staged approach will be necessary. This is not inconsistent with Council timeline for being a zero emissions city (with net zero community emissions by 2035).

Meeting the 2035 net zero emission target will require a significant effort by all organisations in Geelong to focus on reducing existing annual operational community emissions. Residential, commercial and industrial emissions already represent 66% of Geelong's overall community emission profile. All buildings in new PSPs provide a significant opportunity to achieve zero building operational emissions from the outset and avoid creating legacy emissions in addition to the already significant task ahead.

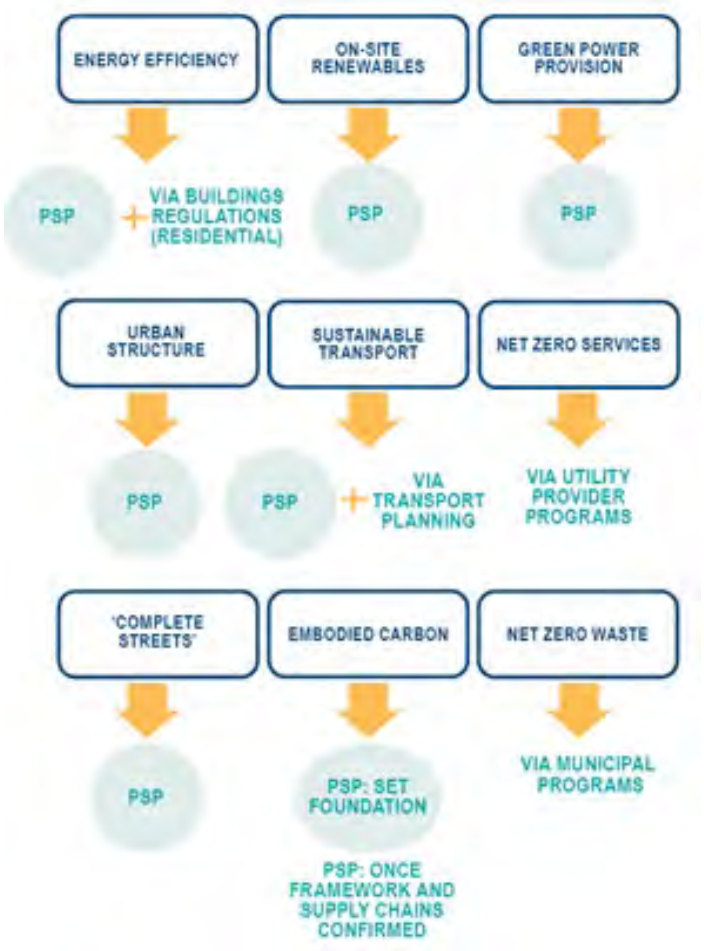


Figure 4: zero emissions hierarchy

One challenge is that once a PSP is approved, due to the complexities associated with planning for these areas and in particular the implications for Development Contribution Plans and financial obligations, there has historically been very little appetite for updating these plans.

While this is inconsistent with cycle of review intended to ensure contemporary relevance applied to other parts of the planning system, nonetheless it does suggest that care will need to be taken to ensure that this precinct, as an innovative precinct now, remain so into the future. For example, as new and agreed systems of measurement and accounting emerge in relation to carbon emissions or supply chains improve, mechanism to ensure these can be considered may be required and updates may be needed to relevant planning controls.

The PSP and associated controls therefore need to seek to ensure there is flexibility for innovation in the future and to allow the PSP to keep pace with a likely rapid rise in minimum expectations. However, they also need to 'lock in' some base line outcomes now that would be difficult to achieve down the track (i.e. removal of gas services, retrofitting, reorientation of buildings and streets, etc.).

4.3 OBJECTIVES

Overarching vision and objectives

The Overarching Vision and Objectives for the PSP set out on Pages 27 & 28 are as follows. Changes recommended to these proposed objectives are also shown in Table 1 below.

Table 1: Overarching Objectives

PROPOSED OBJECTIVE (PSP)	STATUS & RECOMMENDATION	RATIONALE
To facilitate ESD outcomes for all buildings through the application of Residential ESD Design Guidelines and best practice environmental performance rating tools.	AMENDED - To facilitate ESD and carbon neutrality for all residential buildings through the application of Residential ESD Design Guidelines and use of best practice environmental performance rating tools.	ESD outcomes would be improved by being explicit that ESD encapsulates carbon neutral outcomes to prevent ambiguity or misinterpretation.
To deliver sustainable subdivisions and developments by addressing ESD across the stages of planning, design and delivery	AMENDED - To deliver sustainable subdivisions and developments that support carbon neutrality by addressing ESD across the stages of planning, design and delivery.	As above.
To achieve net zero green-house gas emissions during the construction and ongoing operations of the precinct through a range of renewable energy, energy efficiency and fuel switching measures for both subdivision and development.	AMENDED - Proposed to split into two objectives: To reduce greenhouse gas emissions during the construction of the precinct, including through construction management practices and the selection of materials. To achieve net zero greenhouse gas emissions in ongoing operation of the precinct through a range of energy efficiency, renewable energy, and fuel switching measures for both subdivision and development.	Achieving net zero in construction is problematic given it is unlikely to be able to be net zero in the immediate future (see previous discussion) and measurement of construction emissions may be challenging. In relation to operation / design of the precinct, while all aspects (i.e. waste and transport) are not something that will be delivered by applicants, as it is in the PSP as objective and not translated through to a specific requirement on an applicant to deliver on matters which fall outside their sphere of influence then proposed phrasing is supportable. Language could potentially be softened given removal of 'offset' requirement which means 'achieving' may be challenging but retention as drafted recommended given net zero remains the Objective.
To ensure that subdivision and development within the precinct considers the whole-of-life cycle impacts of design and construction through the use of lower embodied carbon, local and recycled mate-rials.	AMENDED - To ensure that subdivision and development within the precinct considers and responds to the whole-of-life cycle impacts of design and construction through the use of lower embodied carbon, local and recycled materials.	Important to not just 'consider' but also act on that consideration.
To create neighbourhoods which prioritise walking and cycling and enable a mode shift from private vehicles to active transport, reducing car dependency.	NO CHANGE	

Thematic Objectives

The Creamery Road PSP then includes a series of Themes, with content related to carbon neutral outcomes dispersed across themes themes. These themes are as follows, with those containing specifically relevant content highlighted with an asterisk. Note as per previous, that many of the other Requirements (such as those relating to urban structure or walkable neighbourhoods) will be important in delivering carbon neutral neighbourhoods but are not addressed directly by this report.

- **Site Layout, Liveability And Character***
- Streets & Public Realm
- **Energy And Technology***
- Ecology
- Integrated Water Management
- Climate Resilient
- Communities
- Delivery

The following Table (Table 2) identifies the relevant thematically arranged content of the draft PSP and proposed changes to objectives. Where changes to standards etc have been recommended in the following section which addresses the specific Standards, these are identified with a #.

PROPOSED OBJECTIVE (PSP)	STATUS & RECOMMENDATION	RATIONALE
Sub-heading - Housing Diversity, Density & Choice #		
To deliver environmentally sustainable and climate resilient housing	AMENDED - To deliver environmentally sustainable and climate resilient housing that support the delivery of carbon neutral neighbour-hoods	Mitigation objective not covered by proposed wording.
Sub-heading - Community Facilities & Education		
To deliver well designed community facilities and schools which are integrated, adaptable, sustainable and responsive to the context within which they are located	AMENDED - To deliver well designed community facilities and schools which are integrated, adaptable, sustainable and responsive to context and aligned with the objective of carbon neutral neighbourhoods.	Mitigation objective not covered by proposed wording.
Sub-heading - Activity Centres		
To ensure the activity cen-tre achieves best practice in ESD and zero carbon through subdivision and development	AMENDED - To ensure the activity centre achieves best practice in ESD and supports a carbon neutral neighbourhood through subdivision and development.	Rephrased to improve clarity
Sub-heading - Sustainable Energy and Zero Carbon #		
	AMENDED - To ensure the provision of utilities and services contribute towards the development of a carbon neutral, fully electric precinct.	Addresses gap in infrastructure related to delivering a carbon neutral neighbourhood
To ensure the design and provision of utilities pro-mote sustainability and a healthy and attractive public realm.	AMENDED - To ensure the design and provision of utilities promote sustainability, carbon neutral neighbourhoods and a healthy and attractive public realm.	Mitigation objective not covered by proposed wording.
To ensure residential and non-residential development and subdivision support generation and supply of renewable energy and achieve net zero carbon by no later than 2035	NO CHANGE	

Table 2: Thematic Objectives

PROPOSED OBJECTIVE (PSP)	STATUS & RECOMMENDATION	RATIONALE
Sub-heading - Smart Cities and Digital Connectivity #		
	NEW -To ensure the precinct supports the use and encourages an increased uptake of electric vehicles by providing appropriate charging facilities and related infrastructure	Addresses gap in relation to electric vehicles
Circular economy #		
To maximise resource recovery and recycling during construction phase.	NO CHANGE	
To minimise levels of em-bodied carbon within construction materials	NO CHANGE	
To encourage a whole-of-lifecycle approach towards buildings and	NO CHANGE	
PRINCIPLES APPLICABLE TO THE ACTIVITY CENTRE #		
PRINCIPLE 4 ESD AND ZERO CARBON Demonstrate best practice ESD and zero carbon from the design stage through to construction and operation.	AMENDED -Demonstrate best practice ESD and alignment with carbon neutral objectives from the design stage through to construction and operation.	Rephased to improve clarity

Table 2: Thematic Objectives (cont.)

4.4 CONTENT OF STANDARDS

This section of the report looks at the specifics of Standards that should be applied to subdivision and development within the NWGGA to deliver carbon neutral neighbourhoods as per the identified objectives. Section 3 of this report identified the follow matters as representing best practice and recommended they be pursued as part of this PSP and associated amendment:

1. Setting an overarching ambition for zero carbon / carbon neutrality
2. Increasing energy efficiency
3. Avoiding fossil fuel use
4. Requiring provision of renewable generation and management of energy loads
5. Ensuring energy sources are renewable
6. Supporting sustainable and zero emission transport
7. Using materials with lower or no embodied carbon

However, only some of these are explored in more detail in this report. Items 2 and 3 in particular are not addressed directly. The reason for this is that they are embedded in much of the existing planning policy and directions at both state and local government for a range of reasons, not merely their contribution to zero carbon outcomes. The content of the PSP as relates to those items has been reviewed and is considered to be appropriate in response to the delivery of net zero outcomes (i.e a focus on pedestrian friendly streets, urban structure which support 20 minute neighbourhood etc). Other items are addressed below.

It is noted that a number of changes from draft of the Objectives and Standards (Requirements / Guidelines) provided for review have been proposed. Review of the prosed Standards and their implementation pathways, including the Deakin University work, indicated a complex process and relationship to the proposed implementation mechanisms, and one which poses challenges in the current planning context. As such, the proposed approach and standards have been considerably simplified to ensure the key components of delivering a carbon neutral neighbourhood are not lost.

Table 3 identifies a summary of the draft Standards provided for review indicating which should be retained, deleted or where new Standards are proposed to be added to the Creamery Road PSP. Their relationship to overarching and thematic Objectives, some of which are also recommended for amendment are then outlined in Section 4.5

ORIGINAL STANDARD		STATUS
R13	Prior to the certification of a plan of subdivision for the first stage of subdivision, all residential subdivision applications must prepare and submit Residential ESD Design Guide-lines to the satisfaction of the responsible authority. The Residential ESD Design Guidelines must be applied as a restriction on the relevant plan of subdivision.	NO CHANGE
R14	The Residential ESD Design Guidelines prepared for residential subdivision must include requirements for:	NO CHANGE
	All new residential dwellings to be constructed to a minimum NatHERS standard of one star above the applicable Nation-al Construction Code standard;	DELETE
	All new residential buildings to be constructed to be all electric in operation.	NEW
	The roof and facade materials of all new residential dwellings to meet a minimum Solar Reflective Index (SRI) benchmark of 50 or greater;	AMENDED
	All new residential lots to allow for future provision of Electric Vehicle Charging Points (EVCPs), to a minimum specification of one 7kW 32Amp EVCP per dwelling;	AMENDED
	All new dwellings with up to two bedrooms to have installed a 3kW minimum capacity solar photovoltaic (PV) system. An additional 1kw capacity solar photovoltaic (PV) system is required for each additional bedroom proposed; and	NO CHANGE
	Apartment buildings to have installed a solar PV system with a capacity of at least 25W per square metre of site coverage or 1kW per dwelling.	NO CHANGE
R20	Any application for subdivision or development of new community and education facilities must commit to the use of a best practice environmental performance rating tool, such as a Green Star Buildings rating of 6 stars, or an equivalent rating achieved through a similar tool. In the case of subdivision, this tool must be applied as a restriction on the relevant plan of subdivision. In the case of development, commitment to use of the relevant best practice environmental performance rating tool must be submitted to the satisfaction of the Responsible Authority prior to a planning permit being granted. A certificate from the relevant best practice environmental performance rating tool must further be submitted to the satisfaction of the responsible authority prior to the commencement of works	AMENDED
R25	Any application for subdivision or development of non-residential (commercial) or mixed use buildings must commit to the use of a best practice environmental performance rating tool, such as a Green Star Buildings rating of 6 stars, or an equivalent rating achieved through a similar tool. In the case of subdivision, this tool must be applied as a restriction on the relevant plan of subdivision. In the case of development, Commitment to use of the relevant best practice environmental performance rating tool must be submitted to the satisfaction of the Responsible Authority prior to a planning permit being granted. A certificate from the relevant best practice environmental performance rating tool must further be submitted to the satisfaction of the responsible authority prior to the commencement of works	AMENDED

Table 3: Status of draft Standards

ORIGINAL STANDARD		STATUS
R(X)	**Infrastructure in the precinct must be designed to support delivery of a carbon neutral neighbourhood. Infrastructure required to support renewable energy generation within the precinct must be shown on relevant plans, as applicable.**	NEW
R59	Prior to: ▪ certification of residential subdivision comprising 10 or more lots and any non-residential subdivision comprising more than 500 square metres of gross floor area; or ▪ the commencement of construction in respect of any development comprising 10 or more dwellings and any non-residential development comprising more than 500 square metres of gross floor area; whichever is the earlier, the permit holder must demonstrate actions to be taken to reduce Scope 1 and Scope 2 green-house gas emissions from construction activities towards net zero, to the satisfaction of the responsible authority. Where these actions do not fully achieve net zero Scope 1 and Scope 2 emissions for construction, applicants must purchase certified carbon offsets to address the gap. Evi-dence of purchase must be submitted to the satisfaction of the responsible authority, prior to certification of subdivision.	DELETE
R59 (re-placement)	**An application to use or subdivide land or construct a building or construct or carry out works must be accompanied by a Zero Carbon Operational Energy Plan which addresses the following, to the satisfaction of the responsible authority:** ▪ **How the precincts layout, infrastructure and / or buildings are designed to deliver an all electric precinct;** ▪ **Infrastructure and mechanisms (such as solar panels, embedded networks, PPAs etc) proposed to ensure development within the precinct is zero carbon in operation; and** ▪ **Infrastructure proposed to manage and monitor energy loads (e.g. load management systems, community batteries etc).**	NEW
R60	Any subdivision and/or development within the Creamery Road PSP must not connect to any existing or future reticulated gas networks.	NO CHANGE
R64	Provision of street and path lighting powered by renewable energy, such as solar PV, is encouraged.	AMENDED
G35	Opportunities for alternative infrastructure and utility delivery models that achieve best practice ESD will be considered.	AMENDED
G36	Provision of neighbourhood scale renewable energy generation or green energy power purchasing agreements are strongly encouraged as part of the pathway to achieve net zero emissions. Neighbourhood scale renewable energy generation will be considered as an alternative to the requirement for individual solar PV systems required under the Residential ESD Design Guidelines	AMENDED
G37	Provision of neighbourhood scale battery storage and virtual power plants for excess renewable energy produced within the precinct is strongly encouraged.	NO CHANGE

Table 5: Status of draft Standards (cont)

ORIGINAL STANDARD		STATUS
R67	20% of all off-street parking provided for non-residential uses must include EV charging. This must be shown on a plan submitted as part of any permit application for subdivision. For all residential uses EV charging must be provided at a rate of one per dwelling. Unless otherwise approved in writing by the Responsible Authority, all parking spaces must be EV charger ready in accordance with NWGGA Smart City Specifications (2022).	AMENDED
R22	The UDF must: [….] Outline provisions for car parking including principles and requirements on the location and design of parking areas (including location of EVCPs), minimising off-street car parking and reducing the footprint of on-grade car parking areas and maximising shared and consolidated car parking opportunities;	AMENDED
R68 (changed to guideline)	Smart infrastructure must be serviced by in situ renewable energy generation and storage, such as solar PV and batteries, where possible.	AMENDED
NAC (Appendix 5)	The NAC must be designed to address the following; ▪ Energy efficient design and construction methods. ▪ WSUD principles. ▪ Create comfortable microclimates by including provision of shades and shelters (sun and wind). ▪ Consider appropriate design solutions to optimise reduction of building energy consumption and maximise internal user comfort such as external shading and appropriate glazing and ventilation ▪ Optimise passive solar orientation ▪ Group waste collection points. ▪ Use renewable energy for heating and cooling. ▪ Investigate other opportunities for built form to reduce greenhouse gas emissions associated with the construction and ongoing operation of buildings to achieve net zero. *Note also - Standard R25 will apply to commercial buildings within the NAC as well as other relevant Standards*	AMENDED

Table 5: Status of draft Standards (cont)

ORIGINAL STANDARD		STATUS
R106	Prior to the certification of a plan of subdivision for the first stage of subdivision, the permit holder must demonstrate, through ISCA Materials Calculator 2.1 or another life cycle assessment tool such as eTool or similar, how the following recycled material targets are achieved for each stage of subdivision: ▪ at least 20% recycled content used in bitumen or alternative road surface material during construction; ▪ at least 30% recycled content within concrete used within construction; ▪ at least 30% recycled content of pipes used within construction; ▪ at least 10% recycled content of road base used within construction; ▪ at least 70% recycled content within street furniture; and ▪ at least 90% recycled or reused materials within construction materials.	DELETE
R(X)	**Prior to the certification of a plan of subdivision for the first stage of subdivision, the permit holder must demonstrate, through ISCA Materials Calculator 2.1 or another life cycle assessment tool such as eTool or similar, how the subdivision achieves the Objectives of Section 3.7 of the Creamery Road PSP and supports a carbon neutral neighbourhood by**: ▪ **Retention of existing built form or other infrastructure where reuse is feasible** ▪ **Increasing the recycled content of road materials, including road base** ▪ **Reducing the amount of embodied carbon in road construction** ▪ **Increasing the use of recycled content in any concrete and pipes used** ▪ **Reducing the amount of embodied carbon in any cement and aggregates used** ▪ **Significantly reducing the amount of embodied carbon in any pipes** ▪ **The selection of street furniture with high levels of recycled content** ▪ **The use of locally sourced materials, particularly the use of local materials for road base** ▪ **Avoiding the use of timber which is not certified by the Forest Stewardship Council or Program for the Endorsement of Forest Certification** ▪ **Use of materials that are certified low volatile organic compound.**	NEW

Table 5: Status of draft Standards (cont)

ORIGINAL STANDARD		STATUS
R(X)	**Prior to the certification of a plan of subdivision for the first stage of subdivision, the permit holder must provide a Construction & Environmental Management Plan which:** ▪ **Demonstrates the steps being taken to reduce emissions from construction activities** ▪ **Demonstrates the proposed management and recycling of construction waste in accordance with the Objectives of Section 3.7 of the Creamery Road PSP** *(note: there may be other requirements of the PSP that could be integrated with this standard, for example relating to IWM outcomes)*	NEW
R105	Prior to the certification of a plan of subdivision for the first stage of subdivision, the permit holder must demonstrate, through ISCA Materials Calculator 2.1 or another life cycle assessment tool such as eTool or similar, how the following embodied carbon targets are achieved or each stage of subdivision: ▪ at least a 60% reduction of embodied carbon in the construction of roads within subdivisions as compared to the reference case; ▪ at least a 40% reduction in embodied carbon in cement used within construction as compared to the reference case; ▪ at least a 20% reduction in embodied carbon in aggregates used within construction as compared to the reference case; and ▪ a 100% reduction in embodied carbon in pipes used within construction.	DELETE
G61	Retention of existing buildings, infrastructure and other structures is encouraged, where adaptive reuse is possible.	DELETE
R107	Prior to the certification of a plan of subdivision for the first stage of subdivision, the permit holder must demonstrate, through ISCA Materials Calculator 2.1 or another life cycle assessment tool such as eTool or similar, how the following locally sourced material targets are achieved for each stage of subdivision: ▪ at least 80% locally sourced (within 50km) quarried road base used within construction; and ▪ at least 30% locally sourced (within 50km) recycled material used during construction.	DELETE
R108	Prior to the certification of a plan of subdivision for the first stage of subdivision, the permit holder must demonstrate how the following construction materials targets are achieved for each stage of subdivision: ▪ 100% of timber used within construction is certified by Forest Stewardship Council (FSC) or Program for the Endorsement of Forest Certification (PEFC); and ▪ at minimum 95% materials used during construction are certified low volatile organic compound (VOC).	DELETE

Table 5: Status of draft Standards (cont)

Amended standards

Table 5 identifies which of the draft Standards subject to this review are proposed to be deleted. It also outlines proposed new Standards to either replace those deleted or address gaps. The Table below (Table 6) identifies the changes that have been proposed to standards that have been retained (other than those identified as No Change') in Table 5.

ORIGINAL STANDARD		AMENDED STANDARD
R14	The roof and facade materials of all new residential dwellings to meet a minimum Solar Reflective Index (SRI) benchmark of 50 or greater;	At least 75% of the development's total site area with a combination of the following elements to reduce the impact of the urban heat island effect: ▪ Green infrastructure. ▪ Roof and shading structures with cooling colours and finishes that have a solar reflectance index (SRI) of: ▪ For roofing with less than 15 degree pitch, a SRI of at least 80] ▪ For roofing with a pitch of greater than 15 degrees, a SRI of at least 40 ▪ Water features or pools. ▪ Hardscaping materials with SRI of minimum 40
	All new residential lots to allow for future provision of Electric Vehicle Charging Points (EVCPs), to a minimum specification of one 7kW 32Amp EVCP per dwelling;	All new residential lots to allow for future provision of Electric Vehicle Charging Points (EVCPs) of one per dwelling. Unless otherwise approved in writing by the Responsible Authority, all EVCPs must be in accordance with NWGGA Smart City Specifications (2022).
R20	Any application for subdivision or development of new community and education facilities must commit to the use of a best practice environmental performance rating tool, such as a Green Star Buildings rating of 6 stars, or an equivalent rating achieved through a similar tool. In the case of subdivision, this tool must be applied as a restriction on the relevant plan of subdivision. In the case of development, commitment to use of the relevant best practice environmental performance rating tool must be submitted to the satisfaction of the Responsible Authority prior to a planning permit being granted. A certificate from the relevant best practice environmental performance rating tool must further be submitted to the satisfaction of the responsible authority prior to the commencement of works	Any application for subdivision or development of new community and education facilities must commit to the use of a best practice environmental performance rating tool, such as a Green Star Buildings rating of 5 stars, or an equivalent rating achieved through a similar tool. In the case of subdivision, this tool must be applied as a restriction on the relevant plan of subdivision. In the case of development, commitment to use of the relevant best practice environmental performance rating tool must be submitted to the satisfaction of the Responsible Authority prior to a planning permit being granted. A certificate from the relevant best practice environmental performance rating tool must further be submitted to the satisfaction of the responsible authority prior to the commencement of works

Table 6: proposed changes to draft Standards (cont)

ORIGINAL STANDARD		AMENDED STANDARD
R22	The UDF must: [….] Outline provisions for car parking including principles and requirements on the location and design of parking areas (including location of EVCPs), minimising off-street car parking and reducing the footprint of on-grade car parking areas and maximising shared and consolidated car parking opportunities;	Outline provisions for car parking including principles and requirements on the location and design of parking areas (including location of EVCPs), minimising off-street car parking and reducing the footprint of on-grade car parking areas and maximising shared and consolidated car parking opportunities;
R25	Any application for subdivision or development of non-residential (commercial) or mixed use buildings must commit to the use of a best practice environmental performance Rating tool, such as a Green Star Buildings rating of 6 stars, or an equivalent rating achieved through a similar tool. In the case of subdivision, this tool must be applied as a restriction on the relevant plan of subdivision. In the case of development, Commitment to use of the relevant best practice environmental performance rating tool must be submitted to the satisfaction of the Responsible Authority prior to a planning permit being granted. A certificate from the relevant best practice environmental performance rating tool must further be submitted to the satisfaction of the responsible authority prior to the commencement of works	Any application for subdivision or development of non-residential (commercial) or mixed use buildings must commit to the use of a best practice environmental performance rating tool, such as a Green Star Buildings rating of 5 stars, or an equivalent rating achieved through a similar tool. In the case of subdivision, this tool must be applied as a restriction on the relevant plan of subdivision. In the case of development, Commitment to use of the relevant best practice environmental performance rating tool must be submitted to the satisfaction of the Responsible Authority prior to a planning permit being granted. A certificate from the relevant best practice environmental performance rating tool must further be submitted to the satisfaction of the responsible authority prior to the commencement of works
G35	Opportunities for alternative infrastructure and utility delivery models that achieve best practice ESD will be considered.	Opportunities for alternative infrastructure and utility delivery models that achieve best practice ESD and support the development of a carbon neutral neighbourhood are encouraged.
R36	Provision of neighbourhood scale renewable energy generation or green energy power purchasing agreements are strongly encouraged as part of the pathway to achieve net zero emissions. Neighbourhood scale renewable energy generation will be considered as an alternative to the requirement for individual solar PV systems required under the Residential ESD Design Guidelines.	Provision of neighbourhood scale renewable energy generation or green energy power purchasing agreements are strongly encouraged as part of the pathway to achieve carbon neutrality. Neighbourhood scale renewable energy generation will be considered as an alternative to the requirement for individual solar PV systems required under the Residential ESD Design Guidelines
R64	Provision of street and path lighting powered by renewable energy, such as solar PV, is encouraged.	Public lighting (street and path lighting) must be powered by renewable energy generation, such as solar PV.

Table 6: proposed changes to draft Standards (cont)

ORIGINAL STANDARD		REDRAFTED STANDARD
R67	20% of all off-street parking provided for non-residential uses must include EV charging. This must be shown on a plan submitted as part of any permit application for subdivision. For all residential uses EV charging must be provided at a rate of one per dwelling. Unless otherwise approved in writing by the Responsible Authority, all parking spaces must be EV charger ready in accordance with NWGGA Smart City Specifications (2022).	A minimum of 5% of all off-street parking provided for non-residential subdivision or development exceeding 5,000 square metres must have EV charging infrastructure and signage installed. This must be shown on a plan submitted as part of any permit application for subdivision. Unless otherwise approved in writing by the Responsible Authority, at least 20 percent of all off-street car parking spaces (or a minimum of one space must be capable of supporting the provision of an appropriate moderate speed EV charging outlet. Appropriate EV infrastructure and cabling must be provided to ensure peak demand is managed for example, distribution use metering systems, scalable load management systems, and cable trays or conduit installation."
R68	Smart infrastructure must be serviced by in situ renewable energy generation and storage, such as solar PV and batteries, where possible.	GUIDELINE Infrastructure, including smart infrastructure, should be serviced by in situ renewable energy generation and storage, such as solar PV and batteries, where possible.
NAC	The NAC must be designed to address the following; ▪ Energy efficient design and construction methods. ▪ WSUD principles. ▪ Create comfortable microclimates by including provision of shades and shelters (sun and wind). ▪ Consider appropriate design solutions to optimise reduction of building energy consumption and maximise internal user comfort such as external shading and appropriate glazing and ventilation ▪ Optimise passive solar orientation ▪ Group waste collection points. ▪ Use renewable energy for heating and cooling. ▪ Investigate other opportunities for built form to reduce greenhouse gas emissions associated with the construction and ongoing operation of buildings to achieve net zero.	The NAC must be designed to address the following; ▪ Energy efficient design and construction methods. ▪ Optimised passive solar orientation. ▪ Employment of appropriate design solutions to minimise building energy consumption and maximise internal user comfort, such as external shading and appropriate glazing and ventilation. ▪ Use of renewable energy for heating and cooling. ▪ The creation of comfortable microclimates by including provision of shades and shelters (sun and wind). ▪ WSUD principles. ▪ Group waste collection points. ▪ Investigation of other opportunities for built form to reduce greenhouse gas emissions associated with the construction and ongoing operation of buildings to net zero

Table 6: proposed changes to draft Standards (cont)

Rationale for proposed changes

As identified in Table 5, a number of changes have been proposed to the draft assessed, having consideration for some of the tensions and opportunities identified in preceding sections of the report.

These are outlined in more detail in Table 8 (Appendix One) but the more significant changes can generally be summarised as follows:

- A shift in focus from emissions associated with the construction phase to the operational phase of the precinct.
- A move away from specific requirements in the form of % reductions relating to embodied carbon.

The rationale for these changes where there is a significant departure from the proposed standard rather than a minor change to drafting is articulated in this section.

Construction phase emissions vs operation phase emissions

Draft wording of the Standard relating to Scope 1 and 2 emissions (Proposed R59) has been specifically linked to "construction activities". "Construction activities" are not defined. There is no specific framework that have been established yet in Australia to consider what should be measured as Scope 1, 2 or 3 emissions across different industry sectors.

With a more advanced carbon measurement framework, Europe provides a good benchmark for what should be included in any assessment of "construction activities". The greenhouse accounting guides produced by the European Union (where greenhouse auditing is further advanced) provides a useful guide for different sectors. What is included under Scope 1 and Scope 2 for the 'construction sector' is shown in Figure 6. Notably, this scope excludes emissions related to waste, materials and the "product", all of which would fall under Scope 3.

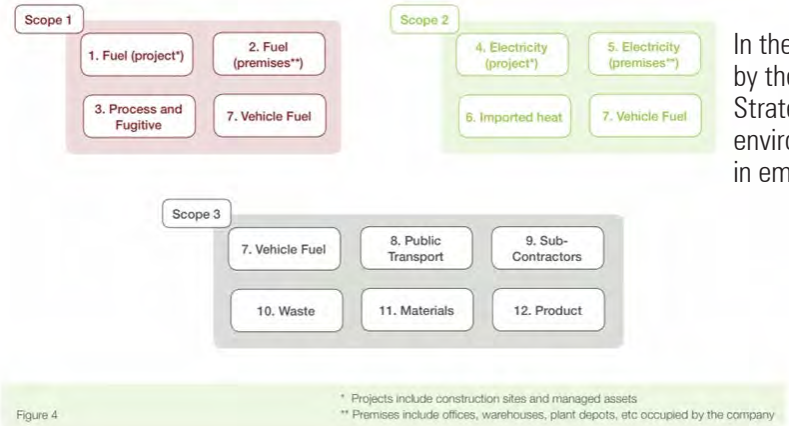


Figure 5: Construction related emission categorisation

In addition to the relatively limited extent of Scope 1 and 2 emissions under this framework there are also significant questions regarding the current knowledge, measurement systems and capacity of applicants to measure emissions under these types of headings, and even more so, to do so in a consistent manner that would provide a robust basis on which to require offsetting of any emissions.

Furthermore, the proportionality of any such requirement is questionable – the impost on the applicant to meet such a requirement is likely to far exceed any benefit which may be derived from it.

Benchmarking in Section 3 suggests the most significant areas where precincts can influence zero carbon / carbon neutral outcomes are in the areas of urban structure, operational energy use, transport emissions and embodied carbon reduction. None of these would be dealt with any meaningful way by applying the Standard as currently drafted. The Figure 7 to the right indicates the proportion of emissions which arise from different phases (in relation to both buildings and infrastructure (such as roads)

In the context of Victoria, mapping of emissions sources by the State Government (via the Emissions Reduction Strategy) also clearly points to the significant role our built environment, and in particular residential development, plays in emissions.

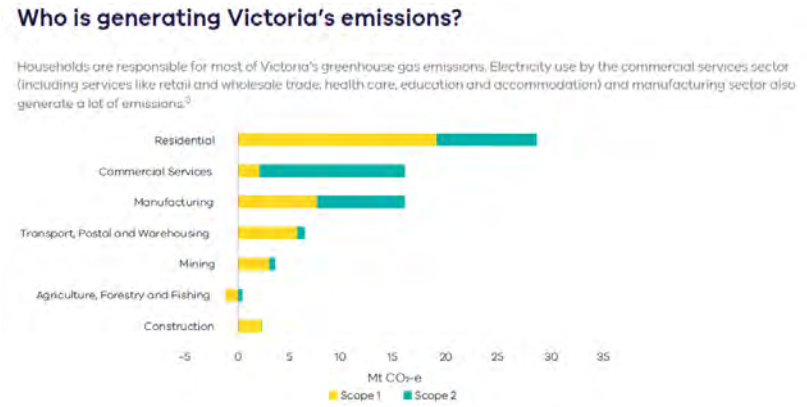


Figure 6: Source of Victoria greenhouse gas emissions (Emissions Reduction Roadmap, DELWP)

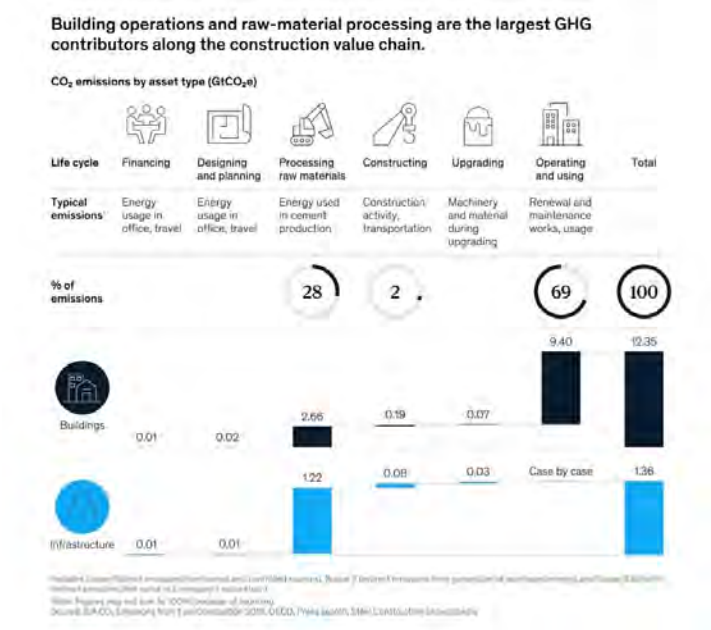


Figure 7: Construction related emission categorisation

Without meaningful consideration of how a fossil fuel free, renewable powered precinct will operate and how each subdivision will address this requirement it will not be possible to manage this transition. In particular, there may be a mismatch between infrastructure and proposed approaches at planning stage that may undermine the ambitions for the precinct. Awareness of the approach proposed by each applicant (i.e. increasing the level of solar provision on private roofs, incorporating a community battery vs a power purchase agreement to support the subdivision power needs vs the application of some as yet unknown technology) allows these to be considered holistically. It is highly likely the appropriate and desirable response will vary depending on the types of uses and scale of the subdivision application, as well as the preferences of the applicant and the current conditions of the energy market. Failure to think through how the operational energy uses within the precinct will be managed to deliver carbon neutral neighbourhoods at subdivision stage will significantly undermine CoGG's ambitions for the growth areas.

The key issues can be summarised as follows:

- There is no agreed framework for consistent definition of what "scope 1 and scope 2 emissions from construction activities" are in the Victoria (or Australian) context
- Using European frameworks as a benchmark "scope 1 and scope 2 emissions from construction activities" are likely to have very limited impact if emissions associated with embodied carbon are not calculated as part of any assessment (see below for discussion)
- Even with limited scope, the calculation of "scope 1 and scope 2 emissions from construction activities" using the European benchmark are likely to be currently beyond the capacity of many applicants

- While there is some ambiguity in the nexus between permits issued at subdivision stage and the operational energy used by the precinct following development, nonetheless, without a plan in place at this stage to deliver net zero operations within this neighbourhood, the objectives of both the framework plan and subsequent PSP are not achievable.
- It is therefore critical to the delivery of carbon neutral neighbourhoods / precincts that applicants be required to demonstrate how that objective can be met considering the particulars of their application and approach (proposed in this document as the provision of a Zero Carbon Operational Energy Plan or ZCOEP).
- A Plan which documents the proposed approach would allow council planners to clearly identify if expectation have been met and to understand any certifications or other mechanisms proposed by an applicant to meet the requirements, which may need to be incorporated into Permit Conditions. To assist applicants, it may be useful to prepare a template or example of a Plan to help guide initial applicants in understanding Council expectations.

Embodied carbon reduction requirements

Notwithstanding the fact that planning is yet to embed net zero operational energy requirements in Victoria, embodied carbon is emerging as the next key area of focus. This is understandable given it becomes the source of an increasingly large proportion of carbon emissions associated with the built environment as the emissions associated with operational energy are increasingly provide by renewable sources. It is therefore understanding that both best practice and the draft Standards reviewed seek to ensure a robust set of standards for the reduction on embodied carbon as precinct develop.

The issue is one of timing. While the standards as proposed are supported, it is not considered reasonable to implement these as drafted at the current time due to the following considerations

- Supply chain issues. Low or zero carbon building materials are emerging rapidly in the market, however, there is little certainty about their availability at a scale and in this location that can underpin any specific requirement.
- Measurement frameworks. While numerous projects, databases and programs have emerged over the last few years, the ability to assess with any equity the various materials that might be proposed by applicant is not yet sufficient clear to support a statutory control
- Industry capacity. In addition to the above, is not clear that the local industry would have the capacity to accurately measure and then to document a % reduction that has been achieved across the proposed areas.

Some parts of proposed requirements seek the provision of a Life cycle assessment which may be a more reasonable way of ensuring applicants are considering the impact of their material choices, and are documenting these. This allows council to understand where reductions in the areas are being addressed, but without the prescriptive % reduction which may be difficult to measure consistently across applications within the precinct.

However, it is noted that there is very considerable work going on in this space, not least of which is a clear driver by industry in this space, as well as the current drafting of an Australian Standard related to embodied carbon. As such, the recommendation is that the requirement for a life cycle assessment, and the specification of areas where improvement is sought are retained but without a specific percentage reduction embedded within planning policy. This allows CoGG to then use a document which does not form part of the statutory controls to communicate what an acceptable scale of reduction is, noting this may change over time. If unreasonably onerous, the usual mechanisms for review would be open to applicants.

It is noted that no requirement to reduce the embodied carbon for development approved under the PSP (and associated UGZ) have been included. Given permits for development can be granted and some of the requirements for embodied carbon reduction would be relevant to such applications (for example the original R105) it is suggested that this should be considered in line with other standards. Subsequent changes would then be required to the UGZ schedule as drafted.

While it is recommended that the specific percentages be removed from the PSP which will be incorporated into the

GGPS, they nonetheless provide an important indicators or best practice and the benchmarks being sought be Council. Given the emerging importance of embodied carbon considerations and the relative novelty of this issue, it is suggested that there may be significant benefit in providing educational material tailored to the local development industry a to what CoGG would like to see in this area. These guidelines (which would sit outside the planning scheme) could include the existing percentages requirements and could provide a link to relevant sources of materials, industry reference and other useful information (for example noting what locally sourced materials are available?)

It's noted that the current drafting of the Requirements relating to the LCA is drafted to apply only to subdivision. Further consideration may be required as to whether this should apply to applications for which the trigger is development rather than subdivision. If the draft Standard is broadened to include development, the previously discussed threshold of 300sqm as per earlier recommendations may be worth considering also

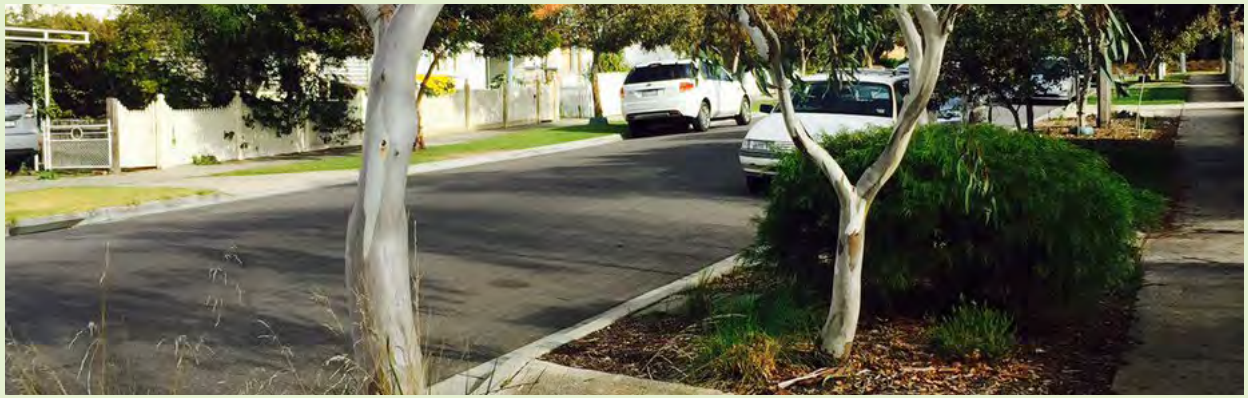
EMBODIED CARBON AND PRECINCTS

The GBCA discussion paper discussed in Section 3 of this report includes a useful summary of these matters from an industry perspective:

Availability of low carbon materials, at the required volume and price for precinct developments, can be uncertain. This will change over time as developers begin to set goals on projects and signal their needs back up the supply chains. Whilst knowledge of upfront carbon is growing, we are aware there are still many issues that prevent choosing lower embodied carbon. Furthermore, while demand is growing, supply chains for civil structures, roads and other precinct elements haven't responded.

There are other challenges, outdated procurement requirements limit material choice. Standards set decades ago still drive procurement, and none had as a consideration the carbon impacts of the chosen material.

Work needs to be done to map all significant players. We need to map material supply chains and construction activities that occur in precinct developments. Roadmaps for decarbonisation should be developed for key carbon intense materials. In tandem, precinct developers should request lower carbon materials from suppliers and contractors where possible. Developers should also work with local governments and road authorities to explore low carbon alternatives to the materials.



4.4 DELIVERING BEST PRACTICE

Standards related to net zero are scattered throughout the PSP and associated implementation tool (the UGZ, see next chapter for more in-depth discussion). Understanding how these all relate to each other is important to establish any gaps or issues requiring resolution. This section therefore brings together the Objectives proposed as related to zero carbon outcomes, with the requirements, as well as touching on the proposed implementation. These are arranged thematically in line with the 'best practice' outcomes for precincts to allow for the identification of gaps, but it is understood they will be dispersed throughout the PSP as proposed by current drafting. References to implementation via the UGZ should be read in conjunction with content included in the following section of this report

The combination of the various Objectives proposed within the PSP make it clear that all aspects of the PSP must contribute towards CoGGs ambitions, and the timeframe for carbon neutrality (by 2035) which is aligned with the NWGGA Framework Plan (and associated planning policy) is clear. The requirements as proposed will delivery carbon neutrality in relation to operational emissions and are anticipated to reduce emissions associated with transport as well as embodied emissions. However, to achieve the overarching Objective of carbon neutrality in 2035, further updates to controls will be required to rachet up requirements such as those relating to embodied carbon as frameworks and measurement tools become more widely understood and accepted.

Also note that further discussion of the proposed Mechanisms, including the Urban Growth Zone is contained in the following chapter, and that commentary is based on a draft version of the UGZ schedule dated May 2022

BEST PRACTICE THEME: SETTING AN OVERARCHING AMBITION FOR NET ZERO

PSP OBJECTIVE/S

- To facilitate ESD and carbon neutral outcomes for all buildings through the application of Residential ESD Design Guidelines and best practice environmental performance rating tools.
- To deliver sustainable subdivisions and developments that support carbon neutral neighbourhoods by addressing ESD across the stages of planning, design and delivery.
- To reduce greenhouse gas emissions during the construction of the precinct, including through construction management practice and the selection of materials.
- To achieve net zero greenhouse gas emissions in ongoing operations of the precinct through a range of renewable energy, energy efficiency and fuel switching measures for both subdivision and development.
- To ensure that subdivision and development within the precinct considers and responds to the whole-of-life cycle impacts of design and construction through the use of lower embodied carbon, local and recycled materials.
- To deliver environmentally sustainable and climate resilient housing that support carbon neutral neighbourhoods
- To deliver well designed community facilities and schools which are integrated, adaptable, sustainable and responsive to context and aligned with the objective of carbon neutral neighbourhoods.
- To ensure the activity centre achieves best practice in ESD and supports the achievement of a carbon neutral neighbourhood through subdivision and development.
- To ensure the provision of utilities and services contribute towards the development of a carbon neutral, fully electric precinct.
- To ensure residential and non-residential development and subdivision support generation and supply of renewable energy and achieve carbon neutrality by no later than 2035
- To minimise levels of embodied carbon within construction materials.
- To encourage a whole-of-lifecycle approach towards buildings and infrastructure, including use of high-quality, locally sourced construction materials with a long lifespan and materials that can be easily recycled or sustainably disposed of at the end of their life.
- To ensure the precinct supports the use and encourages an increased uptake of electric vehicles by providing appropriate charging facilities and related infrastructure

PSP REQUIREMENT/S

Various across a range of themes.

URBAN GROWTH ZONE SCHEDULE

The achievement of carbon neutrality is not specifically referenced (instead the implementation relies on the incorporation of the PSP at Clause 72) and relevant Framework Plan content already included in the GGPS. However an additions Decision Guideline is recommended as follows, in line with requirements for affordable housing:

Whether the application contributes towards the achievement of a carbon neutral neighbourhood in accordance with the incorporated Creamery Road Precinct Structure Plan.

In addition, Council may consider embedding some of the precinct specific objectives within local policy.

BEST PRACTICE THEME: AVOIDING FOSSIL FUEL USE

PSP OBJECTIVE/S

- To ensure the provision of utilities and services contribute towards the development of a carbon neutral, fully electric precinct.

PSP REQUIREMENTS

R60 Any subdivision and/or development within the Creamery Road PSP must not connect to any existing or future reticulated gas networks.

R14 The Residential ESD Design Guidelines prepared for residential subdivision must include requirements for: - All new residential dwellings to be constructed to be all electric in operation.

URBAN GROWTH ZONE SCHEDULE

The UGZ schedule contains an Application requirement (sec 3.0 – Net Zero Operational Energy Plan) which would be anticipated to also confirm the requirement. Either the Plan itself or relevant aspects of it would then be anticipated to be included as Conditions on any Permit.

The requirement for a Net Zero Operational Energy Plan is similar to the proposed "Climate Change Response Plan - Net Zero Emissions by 2035" document proposed in some background work but has a more targeted focus, and seeks to ensure the operational side of emissions utilised available technology to achieve these from day one.

The UGZ schedule contains a specific condition under the heading of Conditions and Requirements for permit. Sec 4.0 – No Gas Development and Subdivision / Functional Layout Plans.

It is recommended that further work be undertaken to ensure that requirements under the UGZ schedule such as the Public Utilities Plan and Functional Layout Plans all clearly include consideration of the infrastructure required to deliver carbon neutral precincts.

PSP OBJECTIVE/S

- To facilitate ESD and carbon neutral outcomes for all buildings through the application of Residential ESD Design Guidelines and best practice environmental performance rating tools.
- To deliver sustainable subdivisions and developments that support carbon neutral neighbourhoods by addressing ESD across the stages of planning, design and delivery.
- To achieve net zero greenhouse gas emissions in ongoing operations of the precinct through a range of renewable energy, energy efficiency and fuel switching measures for both subdivision and development.
- To achieve net zero greenhouse gas emissions in ongoing operations of the precinct through a range of renewable energy, energy efficiency and fuel switching measures for both subdivision and development.
- To deliver environmentally sustainable and climate resilient housing that support carbon neutral neighbourhoods
- To deliver well designed community facilities and schools which are integrated, adaptable, sustainable and responsive to context and aligned with the objective of carbon neutral neighbourhoods.
- To ensure the activity centre achieves best practice in ESD and supports the achievement of a carbon neutral neighbourhood through subdivision and development.
- To ensure the provision of utilities and services contribute towards the development of a carbon neutral, fully electric precinct.
- To ensure residential and non-residential development and subdivision support generation and supply of renewable energy and achieve carbon neutrality by no later than 2035

BEST PRACTICE THEME: Requiring provision of renewable generation / Ensuring energy sources are renewable

PSP REQUIREMENTS

R14 The Residential ESD Design Guidelines prepared for residential subdivision must include requirements for - All new dwellings with up to two bedrooms to have installed a 3kW minimum capacity solar photovoltaic (PV) system. An additional 1kw capacity solar photovoltaic (PV) system is required for each additional bedroom proposed;
Apartment buildings to have installed a solar PV system with a capacity of at least 25W per square metre of site coverage or 1kW per dwelling.

R20 Any application for subdivision or development of new community and education facilities must commit to the use of a best practice environmental performance rating tool, such as a Green Star Buildings rating of 6 stars, or an equivalent rating achieved through a similar tool.

R25 Any application for subdivision or development of non-residential (commercial) or mixed use buildings must commit to the use of a best practice environmental performance rating tool, such as a Green Star Buildings rating of 6 stars, or an equivalent rating achieved through a similar tool.

R(X) Infrastructure provided within the precinct must be designed to support the delivery of a carbon neutral neighbourhood and infrastructure required to support renewable energy generation within the precinct must be shown on relevant plans, as applicable.

R(X) An application to use or subdivide land or construct a building or construct or carry out works must be accompanied by a Zero Carbon Operational Energy Plan which addresses the following, to the satisfaction of the responsible authority:
- How the precincts layout, infrastructure and / or buildings are designed to deliver an all electric precinct Infrastructure and mechanisms (such as solar panels, embedded networks, PPAs etc) proposed to ensure development within the precinct is zero carbon in operation;
- Infrastructure proposed to manage and monitor energy loads (e.g. load management systems, community batteries etc).
-

R64 Public lighting (street and path lighting) must be powwered by renewable energy generation, such as solar PV and / or batteries, where possible.

G35 Opportunities for alternative infrastructure and utility delivery models that achieve best practice ESD and support zero carbon outcomes are encouraged. -

G36 Provision of neighbourhood scale renewable energy generation or green energy power purchasing agreements are strongly encouraged as part of the pathway to achieve net zero emissions. Neighbourhood scale renewable energy generation will be considered as an alternative to the requirement for individual solar PV systems required under the Residential ESD Design Guidelines.

GXX Infrastructure, including smart infrastructure, should be serviced by in situ renewable energy generation and storage, such as solar PV and batteries, where possible.

R22 / APPENDIX 5 The NAC must be designed to address the following;
- Energy efficient design and construction methods.
- Optimised passive solar orientation
- Employment of appropriate design solutions to minimise building energy consumption and maximise internal user comfort, such as external shading and appropriate glazing and ventilation.
- Use of renewable energy for heating and cooling.

URBAN GROWTH ZONE SCHEDULE

The UGZ schedule includes a number of requirements relevant to the implementation of these standards. This includes:
- Under Application requirements (Sec 3.0) the schedule requires Public Utilities Plan. The proposed wording of this requirement should be redrafted to ensure it reflects the carbon neutral objectives of the PSP.
- The UGZ schedule also includes a General Requirement (at Sec 4.0 Conditions and Requirements for permit) that "A planning permit must include a condition or conditions as appropriate to give effect to any requirements or conditions set out in the Creamery Road Precinct Structure Plan".
- Under Conditions and Requirements for permit (sec 4.0) the schedule requires Functional Layout Plans. The requirement for Residential ESD design guidelines and for Green Star certification for are also identified as Conditions for permit in the schedule.
- There is a requirement for a Net Zero Operational Energy Plan to be provided as part of any application (see highlight box for more details). This is currently identified as a Condition of permit but is more appropriately included as an Application Requirement to ensure carbon neutrality is considered as part of any holistic assessment of an application. The Plan should then be endorsed as a condition of permit.
- An additional decision guideline should be added to the UGZ schedule in keeping with the wording of the decision guidelines related to affordable housing to provide a link to carbon neutral outcomes, as follows:

  Whether the application contributes towards the achievement of a carbon neutral neighbourhood in accordance with the incorporated Creamery Road Precinct Structure Plan.

- The schedule also includes a 'Specific Provision – building and works' which identifies an Urban Design Framework, consistent with the content of the PSP has been prepared and approved by the RA. It must address and respond to Section 3.1.4 (Activity Centres) and Appendix 5 (NAC Design Principles). Further consideration may be needed as to whether an UDF is the most appropriate tool to address some of the matters identified in Section 3.1.4 and the associated Appendix. See NAC discussion for further details.

BEST PRACTICE THEME: IMPROVING ENERGY EFFICIENCY

PSP OBJECTIVE/S

- To facilitate ESD and carbon neutrality for all residential buildings through the application of Residential ESD Design Guidelines and best practice environmental performance rating tools.
- To deliver sustainable subdivisions and developments that support carbon neutral neighbourhoods by addressing ESD across the stages of planning, design and delivery.
- To achieve net zero greenhouse gas emissions in ongoing operations of the precinct through a range of renewable energy, energy efficiency and fuel switching measures for both subdivision and development.
- To deliver environmentally sustainable and climate resilient housing that the delivery of carbon neutral neighbourhoods
- To deliver well designed community facilities and schools which are integrated, adaptable, sustainable and responsive to context and aligned with the objective of carbon neutral neighbourhoods
- To ensure the activity centre achieves best practice in ESD and supports a carbon neutral neighbourhood through subdivision and development.

PSP REQUIREMENTS

R20 Any application for subdivision or development of new community and education facilities must commit to the use of a best practice environmental performance rating tool, such as a Green Star Buildings rating of 5 stars, or an equivalent rating achieved through a similar tool.

R25 Any application for subdivision or development of non-residential (commercial) or mixed use buildings must commit to the use of a best practice environmental performance rating tool, such as a Green Star Buildings rating of 5 stars, or an equivalent rating achieved through a similar tool.

R22 / APPENDIX 5 The NAC must be designed to address the following;

- Energy efficient design and construction methods.
- Optimised passive solar orientation
- Employment of appropriate design solutions to minimise building energy consumption and maximise internal user comfort, such as external shading and appropriate glazing and ventilation.
- The creation of comfortable microclimates by including provision of shades and shelters (sun and wind).

It is also proposed to include a requirement for a Zero Carbon Operational Energy Plan. While not specifically addressing energy efficiency it is considered that additional actions to support energy efficiency (as one of the lowest costs mechanisms for reducing emissions) is likely to form part of many proposals.

URBAN GROWTH ZONE SCHEDULE

Under Conditions and Requirements for permit (sec 4.0) the schedule requires Residential ESD design guidelines, which then form part of any permit issued,

Green Star certification for non-residential uses such as commercial and community uses are also identified as Conditions for permit in the schedule.

There is a Requirement for a Zero Carbon Operational Energy Plan to be provided as part of any application (see highlight box for more details). This is currently identified as a Condition of permit but is more appropriately included as an Application Requirement to ensure carbon neutrality is considered as part of any holistic assessment of an application. The Plan should then be endorsed as a condition of permit.

BEST PRACTICE THEME: USING MATERIALS WITH LOWER OR NO EMBODIED CARBON

PSP OBJECTIVE/S

- To deliver well designed community facilities and schools which are integrated, adaptable, sustainable and responsive to context and aligned with the objective of carbon neutral neighbourhoods
- To ensure the activity centre achieves best practice in ESD and supports a carbon neutral neighbourhood through subdivision and development.
- To maximise resource recovery and recycling during construction phase.
- To minimise levels of embodied carbon within construction materials.
- To encourage a whole-of-lifecycle approach towards buildings and infrastructure, including use of high-quality, locally sourced construction materials with a long lifespan and materials that can be easily recycled or sustainably disposed of at the end of their life.

PSP REQUIREMENTS

R20 Any application for subdivision or development of new community and education facilities must commit to the use of a best practice environmental performance rating tool, such as a Green Star Buildings rating of 5 stars, or an equivalent rating achieved through a similar tool.5
R25 Any application for subdivision or development of non-residential (commercial) or mixed use buildings must commit to the use of a best practice environmental performance rating tool, such as a Green Star Buildings rating of 5 stars, or an equivalent rating achieved through a similar tool.

R (X) Prior to the certification of a plan of subdivision for the first stage of subdivision, the permit holder must provide a Construction Management Plan which:
- Demonstrates the steps being taken to reduce emissions from construction activities
- Demonstrates the proposed management and recycling of construction waste in accordance with the Objectives of Section 3.7 of the Creamery Road PSP

R (X) Prior to the certification of a plan of subdivision for the first stage of subdivision, the permit holder must demonstrate, through ISCA Materials Calculator 2.1 or another life cycle assessment tool such as eTool or similar, how the subdivision and / or development achieves the Objectives of Section 3.7 of the Creamery Road PSP and supports a carbon neutral neighbourhood by:
- Retention of existing built form or other infrastructure where reuse is feasible
- Increasing the recycled content of road materials, including road base
- Reducing the amount of embodied carbon in road construction
- Increasing the use of recycled content in any concrete and pipes used
- Reducing the amount of embodied carbon in any cement and aggregates used
- Significantly reducing the amount of embodied carbon in any pipes
- The selection of street furniture with high levels of recycled content
- The use of locally sourced materials, particularly the use of local materials for road base
- Avoiding the use of timber which is not certified by the Forest Stewardship Council or Program for the Endorsement of Forest Certification
- Use of materials that are certified low volatile organic compound

URBAN GROWTH ZONE SCHEDULE

The requirements for Green Star certification for community, schools and activity centre development are included as Condition of Permit in the schedule. This means projects must also achieve the Other Carbon Emissions - Exceptional Performance (embodied carbon and other emissions under the buildings owner's control) to gain their certification.

The draft UGZ schedule identifies a range of requirements for residential subdivision applications (Canopy Cover Plan etc). A Life Cycle Analysis to address the requirements above should be added to this list.

Under Sec 4.0 Conditions and requirements for permit a Conditions requiring a Life Cycle Assessment (LCA) should be included to give effect to the requirement more broadly

BEST PRACTICE THEME: SUPPORTING SUSTAINABLE AND ZERO EMISSION TRANSPORT

PSP OBJECTIVE/S

- There does not appear to be a related objective under either the Smart Cities & Digital Connectivity theme, nor the Utilities Energy & Technology which related to EVs. It is recommended that a new objective be added to ensure there is a clear link between the objectives and requirements. Potential wording is as follows:

  To ensure the precinct supports the use and encourages an increased uptake of electric vehicles by providing appropriate charging facilities and related infrastructure.

- Alternatively, the Local Assets Objectives could be amended as follows:

  To provide smart city infrastructure necessary for managing and monitoring local assets, and which supports the use of electric vehicles.

PSP REQUIREMENTS

R20 R14 The Residential ESD Design Guidelines prepared for residential subdivision must include requirements for: - All new residential lots to allow for future provision of Electric Vehicle Charging Points (EVCPs) of one per dwelling.

R22 The UDF must:
- [.....]
- outline provisions for car parking including principles and requirements on the location and design of parking areas (including location of EVCPs), minimising off-street car parking and reducing the footprint of on-grade car parking areas and maximising shared and consolidated car parking opportunities;

R67 A minimum of 20% of all off-street parking provided for non-residential uses must include EV charging. This must be shown on a plan submitted as part of any permit application for subdivision. For all residential uses EV charging must be provided at a rate of one per dwelling.

R (X) EV chargers must be provided as per Plan 15 Utilities, Energy & Technology. Unless otherwise agreed, they must support minimum 25kW DC charging, in accordance with the Smart City Technical Specifications (2022) or as amended. Multiple chargers per location are preferred. Finalised charger locations must be shown on a plan submitted as part of any permit application for subdivision.

URBAN GROWTH ZONE SCHEDULE

Under Conditions and Requirements for permit (sec 4.0) the schedule requires Residential ESD design guidelines, which then forms part of any permit issued.

Application requirement (sec 3.0 – NAC Precinct, Urban Design Framework) requires content needed to be outlined as per R22.

An additional Application Requirement is anticipated to be required to address EV charging alongside any other relevant utilities and infrastructure required to support a carbon neutral neighbourhood.

Note: this section does not address active transport and PT access components as discussed above but is confined to matters relating to electric vehicles

As noted, an additional Application Requirement may be needed as the PSP requirement as drafted is not just relevant to the NAC Precinct. It applies to all "non-residential uses". EVCP may be more appropriate as a stand-alone buildings and works specific provision within the schedule to reflect the redrfted Standard.

Consideration also needs to be given to how this standard would be applied to any super-lots created as part of a subdivision application. Addressing the need to consider as part of Building and Works applications as well as subdivision may address this issue as well.

It is also expected, although not specified, that the 5 Star Green Star requirements that apply to the development of a school, community use and commercial development are also likely to result in the provision of EVCP. It is also noted that high density residential applications (which require one EVCP under R14) will need to provide EVCPs as part of the recent updates to the NCC.

Precedents

In providing the above recommendations for how Standards relating to zero carbon may be integrated in the Creamery Road PSP, it is important to have regard to the precedents that exist in relation to these standards. The innovative nature of this work must be acknowledged, and as such, there may be aspects of the standards for which no precedent exists. However, where these do exist, recognising these earlier applications of planning principles is important in setting the framework for any future amendment to the Greater Geelong Planning Scheme.

No gas connection / all electric housing

There is no current precedent at the scale proposed for this growth area, however the Elevating ESD project (with which CoGG is associated) has sought a comparable outcome. Local policy relating to the Arden precinct includes the following objective *"To ensure buildings in Arden achieve high environmental performance standards at the design, construction and operation phases to support net zero emissions by 2040"* which would necessitate all electric development in the majority of cases. Recent reporting from ASBEC has supported electrification as a critical step in achieving net zero (*Unlocking the Pathway: Why electrification is the key to net zero buildings, ASBEC 2021)*.

Urban heat responsive requirements

As above, a comparable standard is included in local policy for the Arden Precinct as a 'Policy Guideline' and is also built into the proposed Elevating ESD standards. Where current policy requires a Green Star rating, this requirement is also currently relevant. Numerous precedents exist in other jurisdictions (for example, the award winning Urban Heat Planning Controls, prepared by Penrith City Council) and a significant evidence base exist as to the need for urban spaces to become more responsive to the Urban Heat Island Effect. Actions underway as part of the Cooling and Greening program within DEWLP (or equivalent) are a clear indicator that planning related controls to address this have support.

Green Star certification requirement

Both Fishermans Bend (via an application requirement under CCZ7) and Arden precincts (via local policy) require Green Star certification. For Fishermans Bend this is a required Condition on Permit for buildings and works over 50sqm (although the requirement varies, 5 star for over 5000sqm and 4 start for over 50sqm) and for Arden is a 'Policy Guideline' for buildings and works over 5000sqm. Clause 51.06 of the Maribyrnong Planning Scheme includes a 'must' requirement for the achievement of a benchmark against the BESS tool within a Particular Provision.

Zero Carbon Operational Energy Plan

A requirement for such a plan has not been included in controls to date, however similar requirements to demonstrate how ongoing operations will function are commonly required either as Application Requirements or as Conditions on Permits for a range of other matters. Integration of relevant items into the precinct infrastructure plans etc required as part of applications is consistent with approaches to other infrastructure requirements under the PSP process.

PRECINCT RENEWABLE ENERGY SYSTEMS

The Victorian Government's Renewable Energy Action Plan has allocated significant resources to support renewable energy sector growth, microgrid and battery demonstration projects. *Development of new greenfield and brownfield precincts and suburbs provide an opportunity to assess new approaches to energy management, such as prompting consideration of distributed energy technologies at the planning stage.* These new approaches to meeting our energy needs can not only achieve better environmental outcomes, but improve economic and affordable living outcomes as well.

(ESD ROADMAP. DELWP, 2020) (authors emphasis added)

Renewable energy requirements

There are no existing precedents in the Victorian Planning Schemes for requiring renewable energy infrastructure at lot scale. This is being proposed as part of the Elevating ESD project, as per a number of the other proposed standards. The City of Moreland (now Merri-bek) undertook extensive research to establish the standard. There is also general acknowledgement through various current state government programs that distributed solar will continue to play an important role in supporting Victoria's energy transition. Generating energy 'on-site' reduces pressure on broader networks and is acknowledged as an important part of energy security for communities (as demonstrated by numerous microgrid and other related projects currently underway in Victoria). The state government ESD Roadmap makes clear that "building design measures that support current and future adoption of renewable energy technologies are increasingly important. Rooftop solar energy systems make an important contribution towards a zero-emission future."

Consistency with PSP guidelines

The recent update to Victoria's PSP Guidelines (*Precinct Structure Planning Guidelines 2021*) does not contain any requirements specific to mitigation. However, it does contain the following:

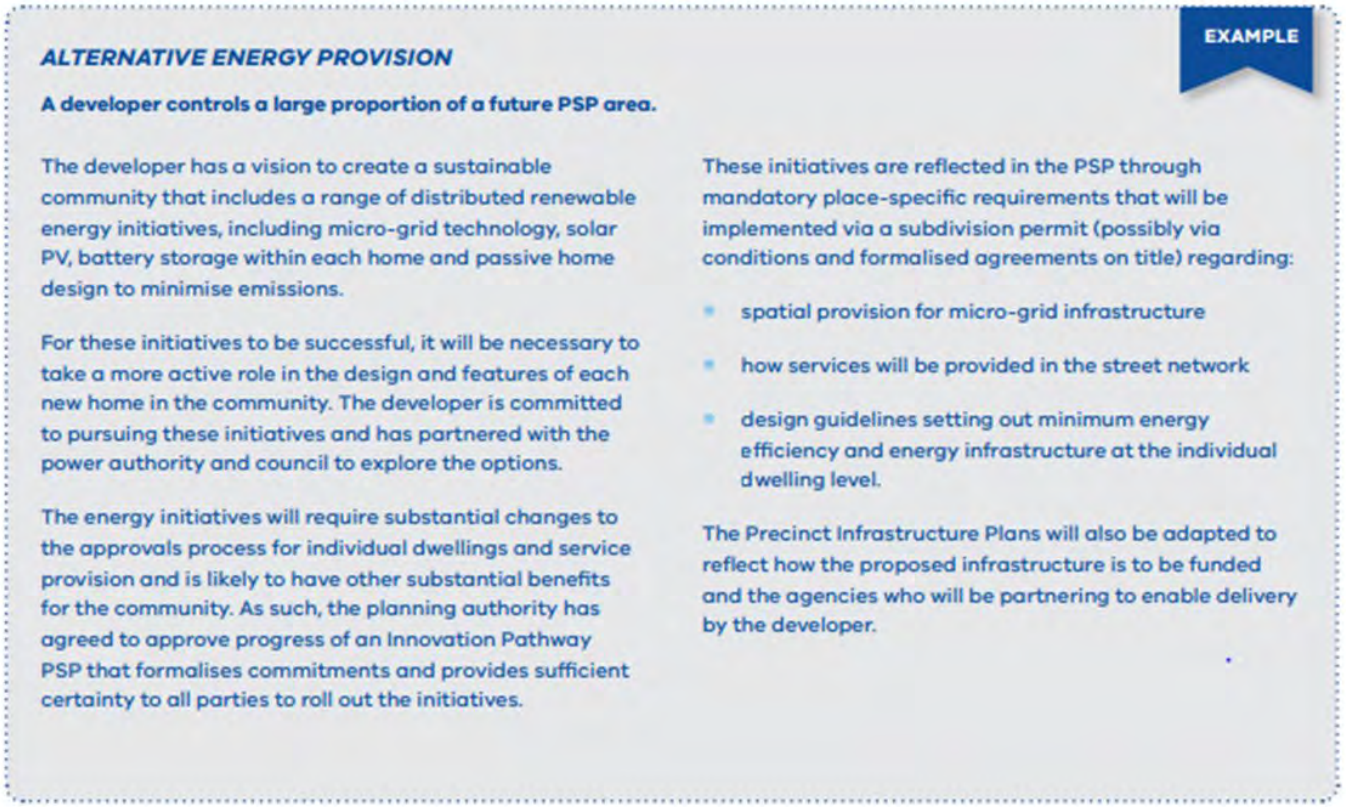
> *T20 Identify all basic and essential infrastructure with spatial requirements on the Future Place-based Plan (e.g. open space, schools, community centres, integrated water management, etc.).*

This is presumably in place as it is important to understand either at a precinct (or by extension) a sub-division) scale the required land take or commitment required to deliver state objectives or requirements (for example, a wetland area identified as an important component of an IWM Plan). The same principle can be applied to the energy related infrastructure that may be required to deliver a carbon neutral outcome.

It will be important to understand the relationship of this infrastructure to the proposed spatial components of any subdivision or development application. Given the variety of responses available to applicants to support a carbon neutral neighbourhood, this suggests the need for material to be provided with any application that demonstrates to council the proposed approach. As such, a requirement relating to a Zero Carbon Operational Energy Plan (ZCOEP) is proposed.

Importantly the approach proposed, whereby the components required to deliver the operational energy outcomes are documented and agreed at subdivision stage and supported by design guidelines for developments within that area is not inconsistent with the approach proposed by the VPAs current Precinct Planning Guidelines (shown in Figure 8 below). While the PSP Guidelines identifying this as a developer driven 'innovation' pathway, in the context of CoGG, with objectives relating to the development of carbon neutral neighbourhoods already embedded in planning policy, the integration of this with requirements across the whole precinct is reasonable. Council, in conjunction with the local energy provider will have a role to play in ensuring that the responses proposed through ZCOEPs for the various applications are coordinated and compatible with network capabilities etc.

It is also noted the PSP Guidelines explicitly allow variation in regional area although they make clear the same principles, features and targets should be considered in the regional context, particularly where larger growth areas are proposed.



EXAMPLE

ALTERNATIVE ENERGY PROVISION

A developer controls a large proportion of a future PSP area.

The developer has a vision to create a sustainable community that includes a range of distributed renewable energy initiatives, including micro-grid technology, solar PV, battery storage within each home and passive home design to minimise emissions.

For these initiatives to be successful, it will be necessary to take a more active role in the design and features of each new home in the community. The developer is committed to pursuing these initiatives and has partnered with the power authority and council to explore the options.

The energy initiatives will require substantial changes to the approvals process for individual dwellings and service provision and is likely to have other substantial benefits for the community. As such, the planning authority has agreed to approve progress of an Innovation Pathway PSP that formalises commitments and provides sufficient certainty to all parties to roll out the initiatives.

These initiatives are reflected in the PSP through mandatory place-specific requirements that will be implemented via a subdivision permit (possibly via conditions and formalised agreements on title) regarding:

- spatial provision for micro-grid infrastructure
- how services will be provided in the street network
- design guidelines setting out minimum energy efficiency and energy infrastructure at the individual dwelling level.

The Precinct Infrastructure Plans will also be adapted to reflect how the proposed infrastructure is to be funded and the agencies who will be partnering to enable delivery by the developer.

Figure 8: PSP Guidelines for new communities, innovation example (page X)

5.0 THE MECHANISMS

THE URBAN GROWTH ZONE

Currently, CoGG are proposing to apply the content of the PSP via the application of the Urban Growth Zone to the Creamery Road precinct. This process has been implemented in line with standard practice for growth areas, and there appears no circumstances to suggest that this area would require a different approach.

One of the critical aspects of this review of proposed standards relates to an assessment of how the standards are proposed to be applied through any future PSA process and a gap analysis to ensure that the amendment has due regard for the mechanism by which the ambitions for a carbon neutral neighbourhood will be delivered.

Implementation provisions in the UGZ typically set out a range of matters, the most relevant of which being:

- *requirements for land use – these can be the requirements of a zone, specific requirements, or both requirements for subdivision*
- *requirements for buildings and works – these can be the requirements of a zone, specific requirements, or both*
- *application requirements*
- *conditions and requirements that must be applied to all permits or defined classes of permit*

All proposed mechanisms to implement carbon neutral standards have been drafted having regard to those matters identified as appropriate to address via the UGZ schedule. The draft UGZ reviewed has translated the PSP Requirements into Specific Provisions, Application Requirements and Conditions for Permits.

Further details on the application of the UGZ (and its associated schedule) are outlined in Planning Practice Note 47. This PPN identifies that an approved PSP works in conjunction with Part B of the UGZ to:

- *articulate the vision for how land should be developed and the desired use and development outcomes to be achieved*
- *identify infrastructure requirements for future communities*
- *detail the form and conditions that must be met by future land use and development*

All three of these considerations are relevant to the content reviewed, and proposed standards support the above.

When drafting a schedule, it is important that:

Only the implementation provisions relevant to the UGZ are included in the schedule to the zone	Only provisions which sit comfortably within the identified headings of the UGZ schedule have been included.
The schedule is clear about where different provisions apply, and in what circumstances (a map should be included in the schedule that shows where particular zones or provisions apply)	Some recommendations have been made to improve some aspects of the current draft in relation to this. The key area for review relates to the Activity Centre and non-residential us-es.
The principles of plain English writing are used when drafting provisions	This is a matter for detailed review of drafting, some minor recommendations have been made.
The land use terms and nesting concepts in clauses 73 of the planning scheme are used	It has been recommended that the phrasing of the current draft of the UGZ be updated to ensure the terminology in relation to non-residential / activity centre development (green star) should be tightened to align with this, and the above requirement.
The requirements of the Ministerial Direction: The Form and Content of Planning Schemes are met.	These requirements deal with the specific phrasing of introductory text. They have not been reviewed as not specifically relevant to the carbon neutral standards, but should be reviewed as part of any overarching review of the UGZ schedule drafting.

Table 7: UGZ drafting requirements (PPN47)

UGZ Schedule (X): Creamery Road Precinct

The relevant aspects of the UGZ schedule and recommended changes are as follows:

Table7: Proposed UGZ implementation mechanisms

UGZ CLAUSE	CHANGE	COMMENTS
Specific provisions – Buildings and Works *(note: as drafted, many of the subsequent provisions relate to subdivision so this title should be updated)*	AMENDMENT REQUIRED	UDF required, which must address and respond to Section 3.1.4 (Activity Centres) and Appendix 5 (NAC Design Principles) of the PSP which include requirements to address matters pertaining to carbon neutrality. Development and subdivision application must then be generally in accordance with any approved UDF.
Specific provisions – Subdivision	NO CHANGE	No relevant provisions
Application requirements	AMENDMENT REQUIRED	Under the current drafting of the UGZ only lots of 10 of more need to provide an assessment against the objectives, strategies and requirements of the SPS. It is recommended that consideration is given to lowering the specification, there is no obvious rationale for lots of say 6 or 8 not having consideration for the objectives of the PSP. It is suggested that this is lowered to 3 lot + subdivision to avoid excluding portions of the growth area from providing a response to the PSP. In addition, the schedule includes a list of requirements that only relate to lots of 10 or more. It is suggested that an approach similar to that within CoGGs existing ESD policy, which also includes requirements (albeit less onerous) for subdivisions of between 3 and 9 lot. A Public Infrastructure Plan is also required for both subdivision and buildings and works. Currently this does not contain any reference to the infrastructure required to support a carbon neutral neighbourhood and should be updated to include this. While implementation via a Condition may be an alternate approach, it is recommended that a requirement for a Zero Carbon Operational Energy Plan is included in this section.
Conditions and Requirements for permits	AMENDMENT REQUIRED	A 'catch-all' requirement has been included in drafting to allow for inclusion of "a condition or conditions as appropriate to give effect to any requirements or conditions set out in the Creamery Road Precinct Structure Plan". A condition is included for all subdivision that prior to certification for the first stage all residential subdivision applications (including mixed use) must prepare an submit ESD Design Guidelines as per Section 3.1.2 of the Creamery Road PSP which are then to be included as a restriction on the plan of subdivision. As noted below, some further resolution of the conditions for mixed use buildings may be required.

UGZ CLAUSE	CHANGE	COMMENTS
Conditions and Requirements for permits (cont.)	AMENDMENT REQUIRED	'ESD Requirements for Community Facilities, Education and Activity Centres' identifies the need to commit to the use and then provide certification of the Green Star to implement the relevant requirement of the PSP. Current references to land uses are not consistent with Clause 73 and the PSP and should be redrafted to ensure it is clear to what applications this condition will apply (especially noting the definition of NAC vs NAC Precinct flagged previously). There would be merit in splitting the requirements for Community / Education uses, and for Activity Centres. Drafting should also be clarified to ensure it is clear to which stage of development the permit requirement relating to Community Facilities, Education and Activity Centre applies It is noted that mixed use or commercial buildings may exist outside the 'Activity Centre' under the PSP and so the title of this Condition should reflect this. In addition, under the current drafting a mixed use building will require both a Green Star certification AND the application of Residential ESD Guidelines to the title. This overlap should be considered further. Currently there is also no minimum threshold for a trigger included. It is suggested that including a threshold consistent with existing policy (at 300sqm GFA) should be included. Subdivision permits will also include a condition requiring a LCA demonstrating response to the requirements within Section 3.7 (Circular Economy) of the Creamery Road PSP. Prior to works commencing a Construction & Environmental Management Plan needs to be submission to address relevant sections of the PSP. Functional Layout Plans are also required as a condition under current drafting. As drafted the UGZ content is not clear in where it applies (for example, "if a site contains smart city infrastructure per Plan 16" is difficult to interpret as "smart city infrastructure" is not defined). In addition, current draft needs to be updated to include more specific reference to EVCPs
Decision Guidelines	AMENDMENT REQUIRED	Decision Guidelines should be included which relate to the carbon neutral objectives of the PSP (i.e. *Whether the application contributes towards the achievement of a carbon neutral neighbourhood in accordance with the incorporated Creamery Road Precinct Structure Plan.*)

Table 7: Proposed UGZ implementation mechanisms (cont.)

Local Policy

It is unclear if there are any updates to Local Policy to support the implementation of the PSP. It is recommended that this is an area that CoGG give further consideration to as embedding some of the key objectives and strategies from within the PSP into local policy may be warranted. Certainly this outcome is contemplated in conjunction with the use of the UGZ. As stated in Planning Practice Note 47:

"It may also be appropriate for parts of the precinct structure plan to be included in the planning scheme as objectives or strategies in the Municipal Planning Strategy, local planning policy or UGZ schedule decision guidelines"

PERMIT TRIGGERS AND ASSESSMENT PATHWAYS

Having regard to the innovative nature of many of the Standards proposed to deliver the carbon neutral objectives for the precinct, it is prudent to consider just how these will be considered and assessed through the planning permit process.

Given the amendment proposed to incorporate the PSP, it is presumes that Part B of the UGZ would be applicable.

The PSP identifies a number of different 'types' of development, which are summarised below:

- NAC
- Housing within the Neighbourhood Activity Centre (NAC)
  - Retail core
  - Bulky goods area
  - Integrated Development Area
- Integrated Development Area
  - Integrated Development Transition Area
  - Integrated Development Mixed Use Area
- Residential Areas
- Standard Residential
- Rural Living
- Community Facility
- School

The head provision of the UGZ triggers a permit for all subdivision.

The schedule to the UGZ identifies applied zone provision which will guide use and buildings and works triggers. As identified in the table found at Appendix Two, there are no gaps in the triggering of permits to address matters relevant to the standards being reviewed as part of this project, other than for community buildings. For these, the applied zone identified via the UGZ schedule is the Public Use Zone which does not include a permit trigger for buildings and work (and therefore the proposed application of a requirement for green star certification as a Condition of permit). This may not be a significant issue if council has committed to delivering a carbon neutral neighbourhood but remains a gap in current triggers. It is also noted that the City has a *Sustainable Building Policy* which would apply, which requires a minimum 5 star Green Star rating for Council-owned buildings.

Residential

For residential development the key permit trigger will be for residential subdivision via the UGZ (37.07-10) and the applied zone.

As with many growth areas, the nature of development means that many of the dwellings constructed post permit for subdivision will not require a planning permit and instead will be assessed via Victoria's building regulations. As such it is important that any requirements being placed on 'conventional' residential development is addressed at subdivision stage.

As with many growth areas, it is common practice for developers in Geelong's growth areas to apply Design Guidelines to their residential estates and to make these requirements legally enforceable via titles issues for the land. Further investigations to ensure the appropriate legal mechanism is used should be pursued. CoGG has proposed to apply Standards relating to single dwellings (and in some cases apartments) via integration with these Design Guidelines. As such, while there will be no specific permit trigger for a single dwelling, nonetheless the trigger for residential subdivisions will act as a de-facto trigger for the application of lot scale requirements.

The exception to this will be development on lots of less than 300sqm which will trigger a permit but also be affected by processes and requirements under the *Small Lot Building Code* developed by the VPA. This is reflected in the proposed content of the UGZ schedule. Council will need to clarify that requirements relating to residential development apply equally to development on a 'small lot' as to other development where a permit is triggered. This is appropriately expressed in the currently drafting the UGZ but should also be clear in any application requirements or other material provided by council.

For multi-unit residential development permit triggers will remain under the applied zones contained within the UGZ schedule (i.e. Mixed Use Zone, Commercial 1 Zone). Furthermore, any multi unit residential development within the proposed NAC will be subject to requirements relating to the NAC.

Non-residential

For non-residential subdivision the permit trigger is in both the UGZ and schedule, with Buildings & Works triggers generally embedded in the applied zones.

The proposed wording within the UGZ schedule is as follows:

All permits for Community Facilities, Education and Activity Centres must include a Condition that requires the permit holder to either:

- *commit to the use of a best practice environmental performance tool via a restriction on the relevant Plan of Subdivision, prior to certification of the plan of subdivision; or*
- *submit a certificate from the relevant best practice environmental performance rating tool prior to a planning permit for buildings and works being granted.*

It is recommended that the drafting of the UGZ reflect the Standard contained within the PSP. This is lost in the current drafting which refer more broadly to a 'best practice environmental management tool'. Failure to specifically reference equivalence to a tool within which carbon neutrality is embedded may risk the loss of this outcome. By including a reference to a Green Star rating or equivalent council has the ability to ensure any alternate rating tool proposed also delivers carbon neutrality.

Further, the current drafting does not make clear that the use of the best practice tool is intended to apply to (i.e. is it to apply to the subdivision itself or to a specific building typology etc that may subsequently seek a permit via the applied zones). The submission of a certificate prior to a planning permit being granted is not consistent with the way tools such as Green Star operate, which is in a series of stages, with certificates of compliance being the critical last stage. Failure to specify either Green Star or the different stages of certification (i.e design and compliance) risks the use of a tool which does not have an 'as built' compliance mechanisms and would therefore be at risk of not being delivered 'on-the-ground'. Permit conditions drafted should be amended to reflect this.

Given the range of uses which are anticipated within the Activity Centre and the different approach proposed, it is also recommended that the permit conditions for this area be 'split' from those applying to Education or Community uses.

ACHIEVING A CARBON NEUTRAL ACTIVITY CENTRE

The approach to delivering the NAC in the Creamery Road Precinct includes identification of a specific area (or Precinct) on Plan 10 to which provisions relating to the NAC apply. The PSP includes a concept plan (Plan 11) which shows the preferred layout and location of uses including:

- Neighbourhood Activity Centre (which the concept plan identifies as including higher density residential, retail, office as well as car parking and public space)
- Community Facility
- Integrated Development Areas (while IDA Mixed Use is shown on legend it does not appear on the plan)
- IDA Transition Areas
- Indicative Drainage Asset
- Community Park

The use of the phrase 'NAC' within the 'NAC precinct' is somewhat confusing and should be rectified.

The PSP (and associated UGZ provisions) then require a UDF to be prepared for the area, with specific reference in the PSP to Appendix 5, which contains a series of design principles. The UGZ schedule requires that the UDF "must address and respond to Section 3.1.4 (Activity Centres) and Appendix 5 (NAC Design Principles) of the incorporated Creamery Road Precinct Structure Plan."

Section 3.1.4 includes requirements relating to the structure of the NAC and provides clarity as to what the UDF need to include. Other than the Green Star requirement for non-residential and mixed use buildings to achieve a 6 Star Green Star certification (or equivalent)

Appendix 5 - ACTIVITY CENTRES provides a significant level of additional detail. This includes T23. NEIGHBOURHOOD ACTIVITY CENTRE DESIGN PRINCIPLES which sets out a wide range of matters which the UDF required by the UGZ schedule (or any development approved prior to that being prepared) must accord with.

Among these are a series of requirements relating to 'ESD and Zero Carbon'. These have been assessed as per other standards relating to zero carbon as they function in generally the same manner.

6.0 RECOMMENDATIONS

Objectives and Requirements / Guidelines in the PSP.

The PSP in general is supported, but a number of recommendations have been made though this report, but are summarised below:

- Insert a new Objective related to electric vehicles in the PSP (see Page 25 for proposed wording)
- Amend Objectives included in the PSP as shown in Tables 1 and 2.
- Delete Requirements and add new Requirements as shown in Table 3.
- Amend the wording of Requirements as shown in Table 4.
- Include a definition / clarification of zero carbon / carbon neutral in the Definitions section of the PSP
- Consider rephrasing references to the NAC Precinct vs NAC to improve clarity

Implementation mechanisms

As outlined in the preceding sections of this report, there are a number of changes required to the current drafting of the UGZ schedule that may be necessary to support the outcomes sought by the PSP (see Table 7). It it noted and ackowledged that further iteratiosn of the UGZ schedule have occured and will continue to occur and that some items identified for consideration in this report my no longer be applicable.

There are a number of changes proposed to the draft UGZ schedule reviewed. These include the following

- Include a Zero Carbon Operational Energy Plan as an Application Requirement
- Redraft the required Public Utilities Plan to include reference to infrastructure to support carbon neutral neighbourhoods.
- Require assessment against the PSP for lots between 3 and 9 as well as 10+.
- Include requirements for residential subdivision of between 3 and 9 lots (either as per drafting or a 'light' version of too onerous. This is consistent with current policy contained at Clause 15.01-1L of the Greater Geelong Planning Scheme relating to ESD which also addresses subdivision of this scale
- Redraft requirement relating to Green Star certification to exclude development of less than 300sqm.
- Redraft the 'non-residential / community' Green Star standard to ensure terminology is clearer and consistent with Clause 73 and the PSP and that non-residential development outside the NAC is captured.
- Redraft the 'non-residential / community' Green Star standard to ensure Green Star is the default and other rating systems must be equivalent to that standard, rather than an undefined best practice tool (which may not deliver carbon neutrality).
- Include a threshold of 300sqm GFA in relation to the requirement for a Green Star certification.
- Redraft the Condition of Permit: Functional Layout Plans to ensure EV charging locations shown in all areas.
- Add an additional Decision Guideline at Section 5.0 of the schedule to reflect carbon neutral objectives.

In addition, the following recommendations are made:

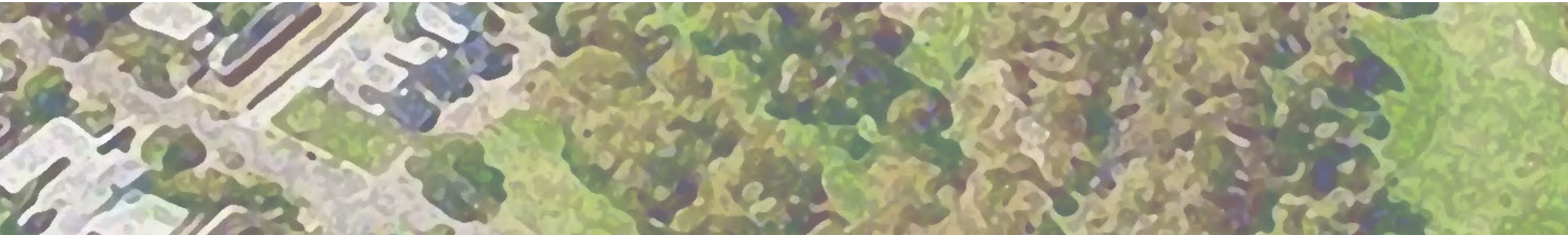
- Consider opportunities to strengthen the statutory weight of the Objectives and strategies of the PSP by including these within local policy.
- Consider if Life Cycle Assessments are also likely to be applied to Buildings & Works, which would require an adjustment to proposed mechanisms.
- Consider the appropriateness of the requirement for low VOC materials, in the context of emissions reduction.
- Consider further the appropriateness of a requirement for a 6 star Green Star certification in addition to the Residential ESD requirement under R14 to mixed-use development, or whether a threshold should be introduced to improve clarity as to when one or the other would apply.

Other recommendations

It is also noted that there are a wide range of supplementary activities that may need to be undertaken by Council to support the proposed outcomes including:

- Ensure that considerations that will inform the acceptance of 'equivalent' tool to Green Star requirements are documented (i.e. must have built in compliance mechanism, must require carbon neutrality in operation etc).
- Clear resolution of the preferred mechnism for the implementation of the identified ESD Design Guidelines should be identified based on relevant legal advice (i.e as restriction on plan of subdivision versus other options such as restriction on title, s173 agreements)
- Further engagement with the local energy provider to ensure an agreed and/ or preferred approach to delivery of net zero outcomes in the growth areas
- Review of the existing IDM, including consideration of the existing 'sustainable' update of (March 2020) to ensure that engineering referrals support he preferred outcomes in the PSP area. This is an area of key concern to applicants.
- Preparation of a 'Guide to reducing embodied carbon in your development' (or similar) to assist developers in reducing their embodied carbon
- Preparation of a 'Tools to support your development' (or similar) to assist developers in understanding which external tools will be of most use in demonstrating their compliance with requirements.
- Preparation of a template Zero Carbon Operational Energy Plan for use by applicants.
- Preparation of a template Residential ESD Design Guidelines for use by applicants.
- Preparation of an Application Checklist that is tailored to subdivisions and / or development in the NWGGA.
- Consider inclusion within cited infrastructure guidelines requirement which will support use of electric vehicles i.e. prominent and / priority location, appropriate signage etc)

PART B: STRATEGIC ASSESSMENT



7.0 BACKGROUND

Under Ministerial Direction No. 11 *Strategic Assessment of Amendments*, any proposed amendment to a Victorian Planning Scheme must be assessed against a series of questions designed to articulate the strategic integrity of the amendment and its consistency with the ambitions of the various legislation with which our planning system intersects.

It is noted that an assessment against the other relevant *Ministerial Direction on the Form and Content of Planning Schemes* has not been undertaken for the amendment more broadly, but only for the specific content proposed for inclusion through this reports recommendations. It is presumed that an assessment against both this Ministerial Direction, and the Practitioners Guide will be undertaken for the broader amendment, whose scope exceeds that addressed by this report.

Under Ministerial Direction No. 12, an assessment of the amendment against the PSP Guidelines among other matters must also be undertaken. A brief assessment of the relevant items is included in relation to relevant matters but it is noted there remains limited directions regarding mitigation opportunities within precincts in the current PSP Guidelines.

8.0 ASSESSMENT

Minister's Direction No. 11 Strategic Assessment of Amendments requires a planning authority to evaluate and discuss how an amendment addresses a number of strategic considerations. It is important to understand that this assessment does not address the entirety of the amendment proposed to introduce the Creamery Road PSP – rather it addresses specifically those aspects of the amendment related to the introduction of requirements, guidelines etc which relate to the stated ambitions for Geelong's growth areas to deliver zero carbon neighbourhoods.

Note: This Assessment has been undertaken against the draft UGZ provided which is dated May 2022 and does not reflect the recommendations contained within this document. This includes items such as requirements for the submission of a Zero Carbon Operational Energy Plan and Construction and Environmental Management Plan.

Why is an amendment required?

What does the amendment intend to do and what is the desired outcome?

Amongst other matters, the amendment seeks to incorporate a range of Objectives, Requirements and Guidelines relating to Zero Carbon and Environmentally Sustainable Development (ESD) within the Creamery Road Precinct Structure Plan (PSP). Those Objectives, Requirements and Guidelines seek to facilitate the delivery of zero carbon neighbourhoods and environmentally sustainable development (ESD) outcomes within the Creamery Road Precinct.

How does it intend to do it?

The amendment utilises the following provisions of the proposed Urban Growth Zone Schedule X (UGZX) to implement and give effect to the requirements of the Creamery Road Precinct Structure Plan (PSP). It does so by:

1. Incorporating the PSP, and associated Objectives, Requirements and Guidelines, into the GGPS as an Incorporated Document at Clause 72.04

2. Applying the UGZX to land within the precinct. This triggers a permit for subdivision and works in most cases.

3. Including a Specific Provision which requires the preparation of an Urban Design Framework for the precincts Activity Centre which must respond to the relevant items identified in the PSP. This must then guide development as per the UGZ drafting.

4. Identifying a range of Application requirements to enable council to assess relevant matters.

   For subdivision applications these include:

   All applications for subdivision must include:

   • Residential Environmentally Sustainable Development (ESD) Design Guidelines, to the satisfaction of the responsible authority, which address and respond to Section 3.1.3 of the incorporated Creamery Road Precinct Structure Plan and any other relevant part of the Creamery Road Precinct Structure Plan as appropriate.

   All Applications to subdivide ten or more lots must include:

   • A written report that sets out how the application implements the objectives, requirements and guidelines within the incorporated Creamery Road Precinct Structure Plan.

   All applications to use or subdivide land or construct a building or construct or carry out works must be accompanied by a Public Utilities Plan.

   For building and works applications these include:

   • All applications to use or subdivide land or construct a building or construct or carry out works must be accompanied by a Public Utilities Plan.

Note: some changes to Application Requirements listed above have been proposed

5. 5. Identifying a range of Conditions and requirements for permits

All permits for Subdivision must include:

• a Condition that requires the preparation and submission of Residential ESD Design Guidelines, with those guidelines applied as a restriction on the relevant Plan of Subdivision.

• A Condition that requires the submission of Functional Layout Plans

All permits for non-residential uses must include a Condition that requires the permit holder to either:

- commit to the use of a best practice environmental performance tool via a restriction on the relevant Plan of Subdivision, prior to certification of the plan of subdivision; or

- submit a certificate from the relevant best practice environmental performance rating tool prior to a planning permit for buildings and works being granted.

All permits for Subdivision and Buildings and Works must include a Condition prohibiting connection to existing and future reticulated gas networks

Note: some additional Conditions are anticipated to be included in response to review of the draft UGZ

Note: recommendation of this report also highlight the need to support decision-makers by including a relevant Decision Guideline in the UGZ schedule.

Is it supported by or is it a result of any strategic study or report?

The proposed Objectives, Requirements and Guidelines relating to Zero Carbon and Environmentally Sustainable Development (ESD) within the Creamery Road Precinct Structure Plan (PSP) are supported by and implement the relevant actions of the adopted Northern and Western Geelong Growth Areas Framework Plan. The Northern and Western Geelong Growth Areas Framework Plan was adopted by Council on 25 August 2020 and was implemented into the Greater Geelong Planning Scheme through Amendment C395, which was gazetted on 6 May 2021. Amongst other matters, Amendment C395 introduced the following strategy into the Greater Geelong Planning Scheme at Clause 11.02.2L (Northern and Western Geelong Growth Areas):

"Ensure urban development delivers carbon neutral neighbourhoods".

The Northern and Western Geelong Growth Areas Framework Plan includes a requirement (Actions W2.4.7 & N2.3.1) that all Precinct Structure Plans within the Northern and Western Geelong Growth Areas include an Environmentally Sustainable Design (ESD) Action Plan, which demonstrates the actions that urban development within the Precinct to deliver zero carbon outcomes and environmentally sustainable development (ESD). The overarching Framework Plan above was also informed by a report prepared by Hip v Hype (*Framework Sustainability Action Plan*, 2019).

In place of a stand-alone Environmentally Sustainable Design (ESD) Action Plan as specified by the Northern and Western Geelong Growth Areas Framework Plan, ESD and zero carbon actions have been embedded throughout the Creamery Road Precinct Structure Plan, with the Precinct Structure Plan structured to be generally in accordance with the Sustainable Subdivisions Framework which is currently being trialled by the City and other municipalities across the state.

The Creamery Road Precinct Structure Plan incorporates a range of specific requirements and performance-based targets to deliver zero carbon outcomes and environmentally sustainable development (ESD).

The specific requirements and performance-based targets included in the PSP were originally derived from a sustainability 'toolkit' for the Northern and Western Geelong Growth Areas that was developed by Deakin University (with Urbis as sub-consultants), which drew from existing best practice examples of tools related to the delivery of ESD and zero carbon objectives.

The requirements were considered as part of a peer review of the Deakin draft undertaken by Hansen Partnership and changes were made to better integrate proposed requirements into the PSP and associated Planning Scheme amendment. Those changes are documented in the NWGGA Zero Carbon Standards Review: Part A. This work identified relevant precedents and established the strategic basis for the individual standards within a broader framework of planning for zero carbon precincts.

The review process also considered feedback which had been provided by the development industry on draft objectives and requirements and the broader implications in terms of delivery of the proposed requirements.

Is the planning scheme the most appropriate means of controlling the issue or achieving the desired outcome, or can another existing regulatory or administrative process deal with the issue?

Incorporating requirements and performance-based targets in a Precinct Structure Plan and giving statutory effect to those requirements and performance-based targets through provisions of the proposed Urban Growth Zone are considered to be the most appropriate means of achieving zero carbon outcomes and environmentally sustainable development (ESD) within a Greenfields urban growth setting. This is consistent with the guidance provided by the PSP Guidelines (2021) and with standard precinct planning practice.

Additional non-statutory tools are also proposed and will be necessary to support aspects of the delivery of zero carbon neighbourhoods which sit beyond the scope of any planning framework. Only aspects of the PSP which are relevant to applications relating to private land and necessary to achieve the adopted objectives for the precinct have been proposed for inclusion within the GGPS.

Will the planning policy or provision to be introduced result in a good planning outcome?

At a State Government level there is an increasing emphasis on preparing for the impacts of climate change. This has included the introduction of the Climate Change Act [2017], Plan Melbourne actions, increased focus on the delivery of renewable energy and various updates to the state Planning Policy Framework. Among these was a change to the Purpose of all Victorian Planning Schemes (AmVC216) **To support responses to climate change.**

At the local level, Council's Climate Change Response Plan 2021-30 establishes a target of **net zero community emissions by 2035,** and local policy explicitly seeks to ensure that urban development within the Northern and Western Growth Areas delivers **"carbon neutral neighbourhoods".** Importantly, this policy was developed in collaboration with the community through an intensive engagement process.

Given an increasingly strong State and Local planning policy focus on planning for the impacts of climate change and facilitating sustainable development, and with the world currently projected to reach 1.5^{o}C above pre-industrial levels within the next two decades based upon the most recent IPCC projections, rapid and drastic emissions reductions are urgently needed and there is an increasingly strong and urgent imperative for land use planning to facilitate zero carbon and environmentally sustainable development (ESD) outcomes.

Establishing requirement for net zero outcomes at precinct planning stage can ensure the most effective and economically efficient options for achieving these outcomes are not lost.

In this context, the delivery of zero carbon and environmentally sustainable development (ESD) outcomes within the Creamery Road Precinct are considered to represent not just good, but necessary planning outcomes.

Will the amendment have a net community benefit? Will the community benefit outweigh the cost of the new requirements?

State and Local planning policy strongly support (a) the facilitation of sustainable development for the benefit of present and future generations and (b) planning for the impacts of climate change.

In seeking to balance competing objectives, the contribution of the zero carbon and environmentally sustainable development (ESD) outcomes seek to achieve the sustainable development objectives of State and Local policy in a substantial and meaningful way, and the achievement of these objectives in the context of a rapidly warming planet are considered to substantially outweigh the additional anticipated complexity and cost of the planning approvals process resulting from the proposed changes.

For these reasons the changes proposed by the amendment in relation to zero carbon outcomes and environmentally sustainable development (ESD) are anticipated to have a net community benefit that significantly outweighs the costs of the new requirements.

Does the amendment repeat provisions already in the scheme? If so, what additional value will the amendment provide?

The changes proposed by the amendment in relation to zero carbon outcomes and environmentally sustainable development (ESD) do not repeat provisions already in the Greater Geelong Planning Scheme.

Is the matter already dealt with under other regulations such as the Building Regulations? For example, the energy rating requirement for residential dwellings.

The changes proposed by the amendment in relation to zero carbon outcomes and environmentally sustainable development (ESD) are not already dealt with under other regulations. It is noted that the proposed changes build upon (not duplicate) the energy rating requirement for residential buildings. The 2022/23 update to the National Construction Code to 7 stars is expected to drive energy efficiency in new housing within the precinct and is not duplicated by proposed controls. The original requirement which state that development should achieve a star rating higher than existing was amended to ensure that the outcomes between planning and building were aligned.

Does the amendment implement the objectives of planning and address any environmental, social and economic effects?

Does the amendment implement the objectives of planning in Victoria (sections 4(1) and 12(1)(a) of the Act)?

The changes proposed by the amendment in relation to zero carbon outcomes and environmentally sustainable development (ESD) will implement the objectives of Section 4 of the Planning and Environment Act 1987. Specifically, they will provide for the fair, orderly, economic and sustainable use and development of the Precinct, in accordance with Clause 11.02.2L (Northern and Western Geelong Growth Areas) and the Northern and Western Geelong Growth Areas Framework Plan (August 2020).

This is also consistent with Section 12(1) of the Act, which requires a planning authority to provide sound, strategic and co-ordinated planning of the use and development of land in its area.

Does the amendment adequately address any environmental, social and economic effects (sections 12(2)(b) and (c) of the Act)?

ENVIRONMENTAL EFFECTS

By ensuring urban development delivers carbon neutral neighbourhoods and environmentally sustainable development (ESD) outcomes in a substantial and meaningful way, the changes proposed by the amendment in relation to zero carbon outcomes and environmentally sustainable development (ESD) are anticipated to have positive environmental effects.

SOCIAL AND ECONOMIC EFFECTS

The implementation of the the changes proposed by the amendment in relation to zero carbon outcomes and environmentally sustainable development (ESD) are anticipated to have the following positive social and economic effects:

- A meaningful contribution towards avoiding the worst consequences of climate change.
- The creation of more liveable, climate-resilient and people-oriented neighbourhoods.
- A reduction in environmental pollution and corresponding improvements to health and wellbeing.
- An increase in the use of active transport and corresponding reduction in car dependency.
- A reduction in the consumption of finite resources.
- An increase in the use of locally sourced materials.

An assessment has been undertaken to ensure that due consideration has been given to the economic costs of the proposed standards. This financial assessment undertken by HillPDA (Zero Carbon Financial Assessment: Creamery Road and Elcho Road East Structure Plans, 2023) considers proposed zero carbon conditions from a number of perspectives including Property developers, Property buyers (owner-occupiers including homebuyers, investors and businesses), Property renters, the City of Greater Geelong andProspective businesses and community users. It found that the financial impacts of the proposed zero carbon standards are generally reasonable for the stakeholder groups assessed in this report, subject to some of the standards being more precisely defined and costs being verified if required and Council being willing to provide the required investment to implement and administer the standards.

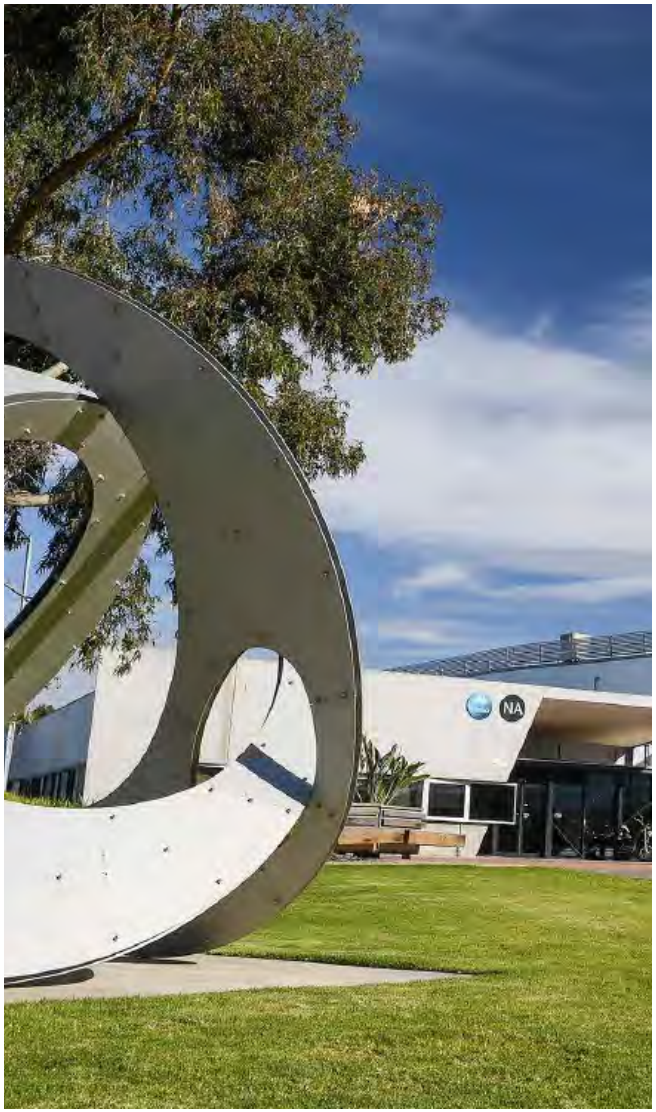
The report found that the proposed standards will increase some up-front costs, but will also generate a range of benefits including

- Delivering marketing, image and prestige advantages for estates that include the standards (including price and / or timing benefits for lot sales)
- Delivering ongoing or recurrent cost savings for properties (including owner-occupiers, renters and businesses)
- Future proofing properties from rising energy costs (e.g. rapid gas cost escalation)
- Supporting higher value of properties and faster sales rates

The report confirmed that from the perspective of land developers, the preliminary estimate shown in this report suggests the increased cost as a result of the standards could be in the order of 3% to 5% of typical land development cost. This scale of cost impact was considered tolerable to development economics given that provisions for electric vehicle stations will become a necessary feature for estate sales in the future and developers may be able to leverage a price premium for estates that offer environmental advantages. Research has shown that price premiums in the range of 7% to 17% have been achieved for properties that offer sustainability advantages over competing properties without such attributes. Payback period were identified for commercial operators and owner occupiers which were considered reasonable (in the order of 5 years for owner occupiers) with significant benefits identified for renters

There are an increasing number of development examples that have delivered initiatives like the proposed zero carbon standards. The examples provide evidence of the market's capacity to absorb financial impacts of sustainability standards and in some cases leverage a price premium or market advantage from them.

However, it is acknowledged that there are inherent challenges in quantifying and subsequently balancing the broader economic benefit to society in the delivery of climate responsive precincts with the specific one-off costs born by an individual applicant, particularly when those costs have subsequent and ongoing benefits for any future residents (i.e. through reduced energy bills). Nonetheless, the economic benefit as they are understood within the Planning and Environment Act would considerably outweigh any costs.



Does the amendment address relevant bushfire risk?

Consideration of bushfire is not applicable to the changes proposed by the amendment in relation to zero carbon outcomes and environmentally sustainable development (ESD) zero carbon standards, however it is noted that relevant bushfire controls are proposed for inclusion in the Precinct Structure Plan.

Does the amendment comply with all the relevant Minister's Directions?

The changes proposed by the amendment in relation to zero carbon outcomes and environmentally sustainable development (ESD) are consistent with the Ministerial Direction on the Form and Content of Planning Schemes under section 7(5) of the Planning and Environment Act 1987.

It is noted however, that some minor drafting amendments to the UGZ schedule may be required to fully comply.

How does the amendment support or implement the Planning Policy Framework and any adopted State policy?

The zero carbon outcomes of the proposed amendment contribute substantially to the achievement of a large range of policies embedded within the PPF and articulated though various Stage policy documents. Among the long list of policies which are supported by the amendment are the following provisions of the Planning Policy Framework:

Clause 01 (Purposes of this planning scheme)

- *To support responses to climate change.*

Clause 11.01-1S (Settlement):

- *To facilitate the sustainable growth and development of Victoria and deliver choice and opportunity for all Victorians through a network of settlements.*
- *Deliver networks of high-quality integrated settlements that have a strong identity and sense of place, are prosperous and are sustainable by:*
  - *Developing settlements that will support resilient communities and their ability to adapt and change".*

Clause 11.02-2S (Structure planning)

- *To facilitate the fair, orderly, economic and sustainable use and development of urban areas.*
- *Undertake the preparation of a hierarchy of structure plans or precinct structure plans that:*
  - *Address the strategic and physical context of the location, including increased physical risks associated with climate change.*
  - *Provide for the development of sustainable and liveable urban areas in an integrated manner informed by the 17 United Nations Sustainable Development Goals as relevant.*
  - *Assist the development of walkable neighbourhoods.*
  - *Facilitate the use of active and sustainable transport modes.*
  - *Facilitate the logical and efficient provision of infrastructure.*
  - *Encourage renewable energy generation, storage and distribution.*
  - *Incorporate integrated water management and urban greening.*

Clause 11.03-2S (Growth Areas)

- *Develop precinct structure plans consistent with the Precinct Structure Planning Guidelines (Victorian Planning Authority, 2021) approved by the Minister for Planning to:*
  - *Respond to climate change and increase environmental sustainability.*

Clause 13.01-1S (Natural hazards and climate change)

- *To minimise the impacts of natural hazards and adapt to the impacts of climate change through risk-based planning.*

Clause 15.01-1S (Urban design)

- *To create urban environments that are safe, healthy, functional and enjoyable and that contribute to a sense of place and cultural identity.*
- *Require development to respond to its context in terms of character, cultural identity, natural features, surrounding landscape and climate.*

- *Ensure development contributes to community and cultural life by improving the quality of living and working environments, facilitating accessibility and providing for inclusiveness."*

Clause 15.02-2S (Building design)

- *To achieve building design and siting outcomes that contribute positively to the local context, enhance the public realm and support environmentally sustainable development".*
  - *Improve the energy performance of buildings through siting and design measures that encourage:*
  - *Passive design responses that minimise the need for heating, cooling and lighting.*
  - *On-site renewable energy generation and storage technology.*
  - *Use of low embodied energy materials.*
  - *Ensure the layout and design of development supports resource recovery, including separation, storage and collection of waste, mixed recycling, glass, organics and e-waste.*
  - *Encourage use of recycled and reusable materials in building construction and undertake adaptive reuse of buildings, where practical.*
  - *Encourage water efficiency and the use of rainwater, stormwater and recycled water.*
  - *Minimise stormwater discharge through site layout and landscaping measures that support on-site infiltration and stormwater reuse.*
  - *Ensure development provides landscaping that responds to its site context, enhances the built form, creates safe and attractive spaces and supports cooling and greening of urban areas.*

Clause 15.01-3S (Subdivision design)

- *To ensure the design of subdivisions achieves attractive, safe, accessible, diverse and sustainable neighbourhoods.*
- *Creating an urban structure that:*
  - *Responds to climate related hazards.*
  - *Incorporates integrated water management, including sustainable irrigation of open space.*
  - *Minimises peak demand on the electricity network.*
  - *Supports energy efficiency and solar energy generation through urban layout and lot orientation.*
  - *Supports waste minimisation and increased resource recovery.*
  - *Providing utilities and services that support the uptake of renewable energy technologies, such as microgrids and energy storage systems, including batteries.*

Clause 15.01-4S (Healthy neighbourhoods)

- *To achieve neighbourhoods that foster healthy and active living and community wellbeing.*

Clause 16.01-2S (Housing affordability)

- *Promoting good housing and urban design to minimise negative environmental impacts and keep costs down for residents and the wider community.*

Clause 18.01-1S (Land use and transport integration)

- *Design neighbourhoods to:*
  - *Better support active living.*
  - *Increase the share of trips made using sustainable transport modes".*

Clause 18.01-3S (Sustainable and safe transport)

- *To facilitate an environmentally sustainable transport system that is safe and supports health and wellbeing*

Clause 19.01-1S (Energy supply):

- *Support the development of energy generation, storage, transmission, and distribution infrastructure to transition to a low-carbon economy".*
- *Facilitate energy infrastructure projects that help diversify local economies and improve sustainability and social outcomes".*
- *Facilitate renewable energy generation and storage to meet on-site energy needs".*

Clause 19.01-2S (Renewable energy)

- *To support the provision and use of renewable energy in a manner that ensures appropriate siting and design considerations are met.*

Clause 19.03-5S (Waste and resource recovery)

- *Encourage development that facilitates sustainable waste and resource recovery.*

The changes proposed by the amendment in relation to zero carbon outcomes and ESD also support and implement the G21 Regional Growth Plan (Geelong Region Alliance, 2013 - a background document at Clause 72.08), which amongst other matters includes an over-arching G21 Regional Strategic Direction to "create sustainable settlements"

The proposed amendment also supports numerous other State policies which are not directly embedded in the GGPS including:

- Contributing to the State's adopted renewable energy targets, legislated under the *Climate Change Act* 2017
- Supporting the State's *Zero Emission Vehicles Roadma*p (2021) and *Gas Substitution Roadmap* (2021)
- Delivering communities which are more resilient to climate change in line with the State's Climate Change Adaptation Plans for the Built Environment and Transport.

In addition to supporting the above policies , the proposed amendment also supports Councils discharge of their responsibilities under the *Local Government Act 2020* which include:

- Under 9(2)(c) Councils are required to **promote the economic, social and environmental sustainability of the municipal district, including mitigation and planning for climate change risks.** *(authors emphasis added)*
- Under 9(2)(b) Councils are required to give priority to achieving the best outcomes for the municipal community, including future generations.

As stated in guidance provided by DELWP in 2020 (Local Government Climate Change Adaptation Roles and Responsibilities under Victorian legislation):

> *This means that processes like strategic planning must incorporate consideration of climate change and relevant state and national plans. There is now a clear expectation that decision-making is supported by robust and transparent practices, and that the long-term adverse consequences of climate change for future generations are incorporated into council planning, decisions and actions.*

How does the amendment support or implement the Local Planning Policy Framework, and specifically the Municipal Strategic Statement?

The changes proposed by the amendment in relation to zero carbon outcomes and environmentally sustainable development (ESD) support and implement the following provisions of the Municipal Strategic Statement and Local Planning Policy Framework, specifically:

- Clause 02.02 (Vision) to facilitate……"Sustainable development that supports population growth and protects the natural environment".

- Clause 02.03-1 (Settlement) "New residential communities should incorporate sustainable living principles and deliver infrastructure to meet community needs".

- Clause 02.03-1 (Settlement – Urban growth areas) "Facilitate the creation of neighbourhoods where residents can live locally and meet most of their everyday needs within a 20-minute walk, cycle or local public transport trip of their home".

- Clause 02.03-5 (Built environment and sustainability) "Encourage environmentally sustainable design in all development".

- Clause 02.03-8 (Transport) "Prioritise active and public transport modes over private vehicle use".

- Clause 02.03-9 (Infrastructure) "Ensure that development and community infrastructure is provided or upgraded in a sustainable and timely manner in all areas, with particular regard to the servicing of new communities in urban growth areas and large urban infill areas".

- • *Clause 11.02-2L (Northern and Western Geelong Growth Areas):*
- *o "To create sustainable neighbourhoods where residents can live locally and meet most of their everyday needs within a 20-minute walk, cycle or local public transport trip of their home".*
- *o "To promote mode shift from private vehicles to active and public transport throughout and between the growth areas and extending into the balance of urban Geelong".*
- *o "To develop the Clever and Creative Corridor as a consistent and unifying design element of the growth areas to ensure development is sustainable, self-sufficient, distinctive and connected by active and public transport options".*
- *o "Ensure urban development delivers carbon neutral neighbourhoods".*
- *o "Design neighbourhoods and integrated transport networks that provide for and prioritise comprehensive, safe and convenient active transport".*
- *o "Prioritise public transport over private vehicles in the design of neighbourhoods and integrated transport networks".*
- • *Clause 15.01-2l (Environmentally sustainable development) "To achieve best practice in environmentally sustainable development from the design stage through to construction and operation".*

It is also noted that City of Greater Geelong is one of a number of Councils who are currently seeking authorisation for a joint amendment that would elevate existing ESD content. Should that amendment proceed, this amendment would complement that proposed update, and is consistent with it.

Does the amendment make proper use of the Victoria Planning Provisions?

The changes proposed by the amendment in relation to zero carbon outcomes and environmentally sustainable development (ESD) makes proper use of the Victoria Planning Provisions by utilising the provisions of the Urban Growth Zone to implement and give effect to the requirements and performance-based targets of the Creamery Road Precinct Structure Plan (PSP).

Support at policy level has been established through Amendment C395 which implement the Objectives of the NWGGA Framework Plan, and additional policy support may also be provided through additional Local Policy (this is yet to be determined at the time of writing).

How does the amendment address the views of relevant agencies?

As part of the preparation of the PSP, consultation (including around the zero carbon / carbon neutral aspects of the PSP) occurred with Powercor and Barwon Water. A number of other relevant state agencies also infleunce the final format of the PSP including DELWP/DEECA/DTP, EPA and other state agencies included in May 2022 consultation. CoGG also consulted with CASBE / MAV to align with existing processes.

9. Does the amendment address the requirements of the Transport Integration Act 2010?

The changes proposed by the amendment in relation to zero carbon outcomes and environmentally sustainable development (ESD) are considered unlikely to have a significant impact on the transport system, as defined by the Transport Integration Act 2010. The changes are considered to support and be consistent with the objectives for the transport system as set out in Part 2, Division 2 of the Act, in particular those objectives which require the transport system to actively contribute to environmental sustainability by (amongst other matters):

(c) promoting forms of transport and the use of forms of energy and transport technologies which have the least impact on the natural environment and reduce the overall contribution of transport-related greenhouse gas emissions; and

(e) preparing for and adapting to the challenges presented by climate change.

What impact will the new planning provisions have on the administrative costs of the responsible authority?

The changes proposed by the amendment in relation to zero carbon outcomes and environmentally sustainable development (ESD) are not anticipated to create any additional planning permit applications than would otherwise be expected as part of the development of a new growth area.

Required documentation under the amendment is not dissimilar to what is sought in other growth areas. Aspects of the amendment relating to zero carbon outcomes and environmentally sustainable development (ESD) require the delivery of additional documentation in response to PSP requirements, but these are not dissimilar to technical reports sought in other contexts and which form part of the usual planning processes.

There will be a quantum of resource implications for Council as part of this amendment. The assessment and approval of some of the application requirements against the changes proposed by the amendment in relation to zero carbon outcomes and environmentally sustainable development (ESD) may require some additional specialised staff – for instance in the assessment of a Zero Carbon Operational Energy Plan. However, many of the resources required are already being engaged and deployed as part of Council broader strategic objectives in becoming a zero carbon council. This includes the engagement of additional ESD staff, who will assist in meeting resourcing requirements generated by this amendment. These resources are likely to contribute to a broader range of council projects than just the operation of the policy which forms part of this amendment.

Additional training is likely to be required for internal council staff, as well as the broader development community. However, these costs are considered to be reasonable and commensurate with any upskilling of staff which occurs in the application on new policy. In addition, resources may be required to support the development of templates and guidance material to support applicants in the application of new policy / requirements.

APPENDIX ONE: STANDARDS TABLE

Memo

The following document outlines proposed changes to the wording of Objectives, Requirements and Guidelines relating to Zero Carbon within the draft Creamery Road PSP provided by the CoGG for review. Some commentary is also included as to the rationale for any changes and/ or consequential matters. Where there are inconsistencies between this document and the content within the body of the report, content in the body of the report should be considered applicable.

OVERARCHING PSP DIRECTIONS

Proposed overarching PSP Objectives (relevant to zero carbon) (Page 27 of the draft Creamery Road PSP). Changes to existing Objectives are underlined for emphasis.

ORIGINAL OBJECTIVE	AMENDED OBJECTIVE	NOTES
To facilitate ESD outcomes for all buildings through the application of Residential ESD Design Guidelines and best practice environmental performance rating tools.	To facilitate ESD and carbon neutrality for residential buildings through the application of Residential ESD Design Guidelines and best practice environmental performance rating tools.	ESD outcomes would be improved by being explicit that ESD encapsulates zero carbon outcomes to prevent ambiguity or misinterpretation.
To deliver sustainable subdivisions and developments by addressing ESD across the stages of planning, design and delivery	To deliver sustainable subdivisions and developments that support carbon neutral neighbourhoods by addressing ESD across the stages of planning, design and delivery.	As above.
To achieve net zero greenhouse gas emissions during the construction and ongoing operations of the precinct through a range of renewable energy, energy efficiency and fuel switching measures for both subdivision and development.	Proposed to split into two objectives: To reduce greenhouse gas emissions during the construction of the precinct, including through construction management practice and the selection of materials. To achieve net zero greenhouse gas emissions in ongoing operations of the precinct through a range of renewable	Have suggested this needs to be split out – achieving net zero in construction is problematic given construction is unlikely to be able to be net zero in the near future. In relation to operational / design of the precinct, an overarching objective of net zero across all aspects including waste and transport is not something that will be delivered by developers but as long as it is in the PSP as objective and not translated through to a specific requirement on developer to deliver on

Hansen Partnership
Melbourne | Byron Bay | Vietnam
ABN 20 079 864 716

Level 4 136 Exhibition St
Melbourne VIC 3000

T 03 9654 8844
E info@hansenpartnership.com.au
W hansenpartnership.com.au

	energy, energy efficiency and fuel switching measures for both subdivision and development.	matters which fall outside their sphere of influence then this should be supportable. Note also the definition of construction activities which may suggest further refinement (see discussion on current precedents for Scope 1 and 2 emissions associated with construction sector). Language could be softened given removal of 'offset' requirement which means 'achieving' may be challenging but have retained as standards as remains the objective.
To ensure that subdivision and development within the precinct considers the whole-of-life cycle impacts of design and construction through the use of lower embodied carbon, local and recycled materials.	To ensure that subdivision and development within the precinct considers and responds to the whole-of-life cycle impacts of design and construction through the use of lower embodied carbon, local and recycled materials.	
To create neighbourhoods which prioritise walking and cycling and enable a mode shift from private vehicles to active transport reducing car dependency.	NO CHANGE	

Proposed thematic Objectives and Requirements / Guidelines (Pages 38 to 130 of the draft Creamery Road PSP).

ORIGINAL STANDARD	ORIGINAL OBJECTIVE	MECHANISM	PROPOSED STANDARD	NOTES
OPERATIONAL ENERGY				
PSP THEME:	Housing diversity, density & choice (Sustainable Housing)			
R13 Prior to the certification of a plan of subdivision for the first stage of subdivision, all residential subdivision applications must prepare and submit Residential ESD Design Guidelines to the satisfaction of the responsible authority. The Residential ESD Design Guidelines must be applied as a restriction on the relevant plan of subdivision.	To deliver environmentally sustainable and climate resilient housing AMENDED To deliver environmentally sustainable and climate resilient housing <u>that support the delivery of carbon neutral neighbourhoods</u>	UGZ Schedule: Application requirement (sec 3.0) Conditions and Requirements for permit (sec 4.0) Note: all Objectives, Requirements and Guidelines need to be addressed by written report on PSP implementation, in addition to any specific mechanisms identified here for 10 or more lots. NEW	NO CHANGE	Embedding consideration of the contribution to the delivery of a net zero neighbourhood into the decision Guidelines of the UGZ is critical to ensuring this matter has weight when decision-makers are balancing applications under this provision.

		An additional decision guidelines should be added to the UGZ schedule in keeping with the wording of the decision guidelines related to affordable housing: • Whether the application contributes towards the achievement of a zero carbon neighbourhood in accordance with the incorporated Creamery Road Precinct Structure Plan.		
R14 The Residential ESD Design Guidelines prepared for residential subdivision must include requirements for: All new residential dwellings to be constructed to a minimum NatHERS standard of one star above the applicable National Construction Code standard;		See above	DELETE (reference to NatHERS rating rather than introduction)	Requiring residential development to meet 8 stars does not have sufficient strategic justification at this point in time, noting the recent increase under the NCC from 6 stars to 7 stars (from 2023). Suggest consideration of the inclusion of existing standard but for 7.5 stars for IDA May need further consideration of the application to Residential Subdivisions and whether this needs to be amended fill a potential gaps where residential development in a mixed use subdivision may not trigger a requirement for any ESD Guidelines, and would therefore be exempt from the associated residential ESD standards Resolution of the application of this condition to super lots which might later accommodate residential development may also need to be considered to address potential gaps.

-	-	-	NEW All new residential dwellings to be constructed to be all electric in operation.	New standard proposed to make delivery of all electric homes explicit
-	-	-	NEW (See note)	Consider the inclusion of additional standards which reflect standards A3, A5, A6 and A7 of the Elevating ESD PSA.
The roof and facade materials of all new residential dwellings to meet a minimum Solar Reflective Index (SRI) benchmark of 50 or greater;		See above	AMENDED At least 75% of the development's total site area with a combination of the following elements to reduce the impact of the urban heat island effect: • Green infrastructure. • Roof and shading structures with cooling colours and finishes that have a solar reflectance index (SRI) of: o For roofing with less than 15 degree pitch, a SRI of at least 80] o For roofing with a pitch of greater than 15 degrees, a SRI of at least 40 • Water features or pools. • Hardscaping materials with SRI of minimum 40	Where there are similar standards, alignment should be sought with the adopted Elevating ESD PSA currently with the Minister. If changes to those standards are made during any approval places, these should be reviewed and corresponding changes to these standards considered.
All new residential lots to allow for future provision of Electric Vehicle Charging Points (EVCPs), to a minimum specification of one 7kW 32Amp EVCP per dwelling;		See above	AMENDED All new residential lots to allow for future provision of Electric Vehicle Charging Points (EVCPs) of one per dwelling.	Standard retained as drafted but specification removed from the standard and reference to relevant specification added as per R67 (note: these have not been sighted but are presumed to provide reasonable

			Unless otherwise approved in writing by the Responsible Authority, all EVCPs must be in accordance with NWGGA Smart City Specifications (2022).	technical standards). This also provides the ability to include alternate specifications to reflect the range of dwelling typologies CoGG is anticipating may be delivered in the precinct. Note for apartment buildings requirement may not be needed as changes to NCC will require these from 2023.
All new dwellings with up to two bedrooms to have installed a 3kW minimum capacity solar photovoltaic (PV) system. An additional 1kw capacity solar photovoltaic (PV) system is required for each additional bedroom proposed; and		See above	NO CHANGE	Suggest additional modelling may be useful in communicating the impacts / benefits of this standard on demand if this work has not already been incorporated in Deakin's modelling.
Apartment buildings to have installed a solar PV system with a capacity of at least 25W per square metre of site coverage or 1kW per dwelling.		See above	NO CHANGE	While the Elevating ESD PSA includes the following *"Note: Alternative renewable energy sources where it can be established that the generation would be equal or greater than that generated by solar PV on site are acceptable"* which is an important consideration, G36 of the PSP provides this potential. It is suggested that additional modelling / testing of the built form outcomes envisaged by the PSP in higher density areas may be useful to understand the potential overshadowing of roof space and the ability of applicants to meet this requirement.
PSP THEME:	Community facilities & education (Well designed)			
R20 Any application for subdivision or development of new community and education facilities must commit to the use of a best practice environmental performance rating	To deliver well designed community facilities and schools which are integrated, adaptable, sustainable and responsive to	UGZ Schedule: Conditions and Requirements for permit (sec 4.0)	AMENDED Standard retained as drafted but adjusted to reference 5 Stars rather than 6	As noted, to aid implementation, clarification of the aspects of Green Star that are required to demonstrate 'equivalence' would be useful. If a 'dating' of the Green Star tool is

tool, such as a Green Star Buildings rating of 6 stars, or an equivalent rating achieved through a similar tool. In the case of subdivision, this tool must be applied as a restriction on the relevant plan of subdivision. In the case of development, commitment to use of the relevant best practice environmental performance rating tool must be submitted to the satisfaction of the Responsible Authority prior to a planning permit being granted. A certificate from the relevant best practice environmental performance rating tool must further be submitted to the satisfaction of the responsible authority prior to the commencement of works.	the context within which they are located. AMENDED To deliver well designed community facilities and schools which are integrated, adaptable, sustainable and responsive to context and aligned with the objective of carbon neutral neighbourhoods			required through any part of the PSA process then a provision should be made for updating of that date to reflect changes to Green Star (for example, the future introduction of embodied carbon consideration) to ensure that requirement embedded in the scheme reflect current best practice. Councils Sustainable Building Policy seeks 5 Star development so aligning these is logical given carbon neutrality is built into both 5 and 6 Star Green Star ratings.
PSP THEME:	Activity Centres (Best Practice ESD)			
R25 Any application for subdivision or development of non-residential (commercial) or mixed use buildings must commit to the use of a best practice environmental performance rating tool, such as a Green Star Buildings rating of 6 stars, or an equivalent rating achieved through a similar tool. In the case of subdivision, this tool must be applied as a restriction on the relevant plan of subdivision. In the case of development, commitment to use of the relevant best practice environmental performance	To ensure the activity centre achieves best practice in ESD and zero carbon through subdivision and development. AMENDED To ensure the activity centre achieves best practice in ESD <u>and supports a</u> carbon neutral neighbourhood through subdivision and development.	UGZ Schedule: Conditions and Requirements for permit (sec 4.0)	NO CHANGE	See above

rating tool must be submitted to the satisfaction of the Responsible Authority prior to a planning permit being granted. A certificate from the relevant best practice environmental performance rating tool must further be submitted to the satisfaction of the responsible authority prior to the commencement of works.				
PSP THEME	Sustainable energy & zero carbon (zero carbon)			
R58 Trunk infrastructure must be placed generally in accordance with *Plan 15 Utilities, Services & Technology.*	To ensure the provision of utilities and services contribute towards the development of a zero carbon, fully electric precinct.	UGZ Schedule: Application requirement (sec 3.0 – Public Utilities Plan) Conditions and Requirements for permit (sec 4.0 – Functional Layout Plans)		
		UGZ Schedule: Application requirement (sec 3.0 – Public Utilities Plan) Conditions and Requirements for permit (sec 4.0 – Functional Layout Plans)	NEW R(X) – Precinct infrastructure must be designed to support a zero carbon future and infrastructure required to support renewable energy generation within the precinct must be shown on relevant plans, as applicable. As the new standard is worded it relates to a 'precinct'. Sec 3.0 Public utilities plan applies to "an application to use or subdivide land or construct a building or construct or carry out works" (i.e., everything, including small scale stuff).	While there is a relevant objective there is not a corresponding requirement which specifically reference the infrastructure required to deliver a net zero precinct.

			Sec 3.0 Public utilities plan, should be redrafted to: • The provision of infrastructure to support a zero carbon future. • The provision of infrastructure to support renewable energy generation.	
R59 Prior to: • certification of residential subdivision comprising 10 or more lots and any non-residential subdivision comprising more than 500 square metres of gross floor area; or • the commencement of construction in respect of any development comprising 10 or more dwellings and any non-residential development comprising more than 500 square metres of gross floor area; whichever is the earlier, the permit holder must demonstrate actions to be taken to reduce Scope 1 and Scope 2 greenhouse gas emissions from construction activities towards net zero, to the satisfaction of the responsible authority. Where these actions do not fully achieve net zero Scope 1 and Scope 2 emissions for construction, applicants must purchase certified carbon offsets to address the gap. Evidence of purchase must be submitted to the satisfaction		UGZ Schedule: DELETE Conditions and Requirements for permit (sec 4.0 – Zero Carbon Construction)	DELETE	The measurement of Scope 1 and 2 emissions associated with construction activities is currently problematic due to a number of reasons, including: • A lack of a documented framework for what should be considered under the banner of 'construction activities' (noting European precedents). • Current drafting may not support the delivery of a zero carbon / zero carbon ready precinct, with a focus on the emissions associated with construction activity only, given the end 'product' of the activities (in this case the precinct) and the materials used would likely fall under Scope 3. • A lack of industry capacity to identify and measure these emissions. • A lack of a consistent and agreed tool for the measurement of embodied carbon in various materials used in construction. "To the satisfaction of the RA" is problematic in this context too as the

of the responsible authority, prior to certification of subdivision.				impacts of various positions being taken by the RA could be differ widely and the ability to assess the reasonableness of this standard is difficult. Requiring offsets is also considered premature and potentially problematic in application on the basis of the above and the inability to currently quantity the financial impact of these costs on that basis. The scope of development captured by this Standard is also problematic as, for example, 9 lot subdivisions would not be required to demonstrate in any way they were contributing to the achievement of CoGG's net zero ambitions for this precinct.
		UGZ Schedule: AMEND TO INCLUDE Application requirement (sec 3.0 – Net Zero Operational Energy Plan)	NEW An application to use or subdivide land or construct a building or construct or carry out works must be accompanied by a Zero Carbon Operational Energy Plan which addresses the following, to the satisfaction of the responsible authority: • How the precincts layout, infrastructure and / or buildings are designed to deliver an all electric precinct • Infrastructure and mechanisms (such as solar panels, embedded networks, PPAs etc)	The proposed requirement would allow oversight of any subdivision or developments proposed approach to meeting some of the overarching Objectives. It provides a mechanism for understanding how the moving parts of energy efficiency, onsite generation, load management and off site purchases etc will be managed in a coordinated way to deliver the PSPs objectives. A template and example plan should be prepared by Council to support applicants and ensure a consistency of application material to support assessment processes. No specific permit conditions have been proposed for this Requirement as it is

			proposed to ensure development within the precinct is zero carbon in operation; • Infrastructure proposed to manage and monitor energy loads (e.g. load management systems, community batteries etc).	likely that the outcomes proposed through ZCOEP's may vary and permit conditions should be drafted to reflect the approach proposed to delivering net zero, rather than the application of a generic condition.
R60 Any subdivision and/or development within the Creamery Road PSP must not connect to any existing or future reticulated gas networks.		UGZ Schedule: Application requirement (sec 3.0 – Net Zero Operational Energy Plan) Conditions and Requirements for permit (sec 4.0 – No Gas Development and Subdivision / Functional Layout Plans)	NO CHANGE	Depending on the likelihood of other fossil fuels being available within the precinct, alternate wording such as that included in the Elevating ESD PSA may be worth consideration: Standard A4: *"All new development should be designed to avoid consumption of natural gas or other onsite fossil fuels."*
PSP THEME	Sustainable energy & zero carbon (Sustainable and Attractive Public realm)			
R64 Provision of street and path lighting powered by renewable energy, such as solar PV, is encouraged.	To ensure the design and provision of utilities promote sustainability and a healthy and attractive public realm. AMENDED To ensure the design and provision of utilities promote sustainability, <u>zero carbon neighbourhoods</u> and a healthy and attractive public realm.	UGZ Schedule: Application requirement (sec 3.0 – Public Utilities Plan) (sec 3.0 – Net Zero Operational Energy Plan) Conditions and Requirements for permit (sec 4.0 – Functional Layout Plans)	AMENDED Public lighting (street and path lighting) must be powered by renewable energy generation, such as solar PV and / or batteries, where possible.	Reworded to reflect the phrasing of R68 and to reflect 'requirement' vs 'guideline'. Noted that this (and potentially some other requirements) may require associated updates to Council IDM and other internal approval processes to ensure internal barriers are considered.
PSP THEME	Sustainable energy & zero carbon (supporting Renewable energy)			
G35 Opportunities for alternative infrastructure and utility delivery models that achieve best practice ESD will be considered.	To ensure residential and non-residential development and subdivision support generation and supply of	UGZ Schedule: Application requirement (sec 3.0 – Public Utilities Plan)	AMENDED Opportunities for alternative infrastructure and utility delivery	Reference to zero carbon added.

	renewable energy and achieve net zero carbon by no later than 2035	(sec 3.0 – Net Zero Operational Energy Plan) Conditions and Requirements for permit (sec 4.0 – Functional Layout Plans)	models that achieve best practice ESD and support zero carbon outcomes are encouraged.	
G36 Provision of neighbourhood scale renewable energy generation or green energy power purchasing agreements are strongly encouraged as part of the pathway to achieve net zero emissions. Neighbourhood scale renewable energy generation will be considered as an alternative to the requirement for individual solar PV systems required under the Residential ESD Design Guidelines.		UGZ Schedule: Application requirement (sec 3.0 – Public Utilities Plan) (sec 3.0 – Net Zero Operational Energy Plan) Conditions and Requirements for permit (sec 4.0 – Functional Layout Plans)	AMENDED Provision of neighbourhood scale renewable energy generation or green energy power purchasing agreements are strongly encouraged as part of the pathway to achieve net zero carbon. Neighbourhood scale renewable energy generation will be considered as an alternative to the requirement for individual solar PV systems required under the Residential ESD Design Guidelines.	Minor language adjustment to be consistent in reference to zero carbon vs zero emissions.
G37 Provision of neighbourhood scale battery storage and virtual power plants for excess renewable energy produced within the precinct is strongly encouraged.		UGZ Schedule: Application requirement (sec 3.0 – Public Utilities Plan) (sec 3.0 – Net Zero Operational Energy Plan) Conditions and Requirements for permit (sec 4.0 – Functional Layout Plans)	NO CHANGE	The delivery of this Guideline (and G35 and G36), and understanding how these and other Standards 'fit' together to deliver a zero carbon neighbourhood should be implemented / articulated through the proposed Zero Carbon Operational Energy Plan (see earlier)
PSP THEME:	Smart cities & digital connectivity			
R67 20% of all off-street parking provided for non-residential uses must include EV charging. This must be shown on a plan submitted as part of any permit application for subdivision. For all residential uses EV charging must be provided at a rate of one per dwelling.	There does not appear to be a related objective under either the Smart Cities & Digital Connectivity theme, nor the Utilities Energy & Technology which related to EVs. It is recommended that a new objective be added to ensure there is a clear link between the objectives and	UGZ Schedule: Application requirement (sec 3.0 – NAC Precinct, Urban Design Framework, content needed to be outlined as per R22) Current location in the UGZ schedule is not appropriate given it applies to all "Non-	AMENDED A minimum of 5% of all off-street parking provided for non-residential subdivision or development exceeding 5,000 square metres must have EV charging infrastructure and signage installed. This must be	Change made to other residential EV standard to provide consistency. This is amended to provide consistency with the relevant standard within the Elevating ESD PSA given council is a part to that amendment. Further consideration may need to be given to the prefer manner of the 20% provision in situations such as at grade car parks,

Unless otherwise approved in writing by the Responsible Authority, all parking spaces must be EV charger ready in accordance with NWGGA Smart City Specifications (2022).	requirements. Alternatively, the Local Assets Objectives could be amended as follows: To provide smart city infrastructure necessary for managing and monitoring local assets, and which supports the use of electric vehicles.	residential" uses, not just the NAC	shown on a plan submitted as part of any permit application for subdivision. Unless otherwise approved in writing by the Responsible Authority, at least 20 percent of all off-street car parking spaces (or a minimum of one space must be capable of supporting the provision of an appropriate moderate speed EV charging outlet. Appropriate EV infrastructure and cabling must be provided to ensure peak demand is managed for example, distribution use metering systems, scalable load management systems, and cable trays or conduit installation." Related change: R22 • outline provisions for car parking including principles and requirements on the location and design of parking areas (including location of EVCPs), minimising off-street car parking and reducing the footprint of on-grade car parking areas and maximising shared and consolidated car parking opportunities;	and for the different contexts (i.e medical centre vs supermarket). But these differences could be incorporated into guidance which sits outside the PSA. Consideration needs to be given to how this standard would be applied to any super-lots created as part of a subdivision application.
R68 Smart infrastructure must be serviced by in situ renewable			AMENDED	The wording and the variety of infrastructure that may emerge as a

energy generation and storage, such as solar PV and batteries, where possible.			Guideline Infrastructure, including smart infrastructure, should be serviced by in situ renewable energy generation and storage, such as solar PV and batteries, where possible.	result of new technologies means it is difficult to assess if 'in-situ' will always be the most effective. Changing this to a Guideline allows also for the broadening out of the standard to encompass other infrastructure that may be delivered within the precinct which sits outside the 'Smart' banner but still provide opportunities to be powered by renewable generation and storage.
NAC				
The NAC must be designed to address the following; • Energy efficient design and construction methods. • WSUD principles. • Create comfortable microclimates by including provision of shades and shelters (sun and wind). • Consider appropriate design solutions to optimise reduction of building energy consumption and maximise internal user comfort such as external shading and appropriate glazing and ventilation • Optimise passive solar orientation • Group waste collection points. • Use renewable energy for heating and cooling. • Investigate other opportunities for built form to reduce greenhouse gas emissions associated with	PRINCIPLE 4 ESD AND ZERO CARBON Demonstrate best practice ESD and zero carbon from the design stage through to construction and operation. AMENDED PRINCIPLE 4 ESD AND ZERO CARBON Demonstrate best practice ESD <u>and alignment with zero carbon objectives</u> from the design stage through to construction and operation.	UGZ Schedule: Application requirement (sec 3.0 – NAC Precinct, Urban Design Framework, content needed to be outlined as per R22)	The NAC must be designed to address the following; • Energy efficient design and construction methods. • Optimised passive solar orientation • Employment of appropriate design solutions to minimise building energy consumption and maximise internal user comfort, such as external shading and appropriate glazing and ventilation. • Use of renewable energy for heating and cooling. • The creation of comfortable microclimates by including provision of shades and shelters (sun and wind). • WSUD principles. • Group waste collection points.	

the construction and ongoing operation of buildings to achieve net zero.			• Investigation of other opportunities for built form to reduce greenhouse gas emissions associated with the construction and ongoing operation of buildings to net zero.	
EMBODIED CARBON				
PSP THEME:	Circular economy (resource recovery & Recycling)			
R106 Prior to the certification of a plan of subdivision for the first stage of subdivision, the permit holder must demonstrate, through ISCA Materials Calculator 2.1 or another life cycle assessment tool such as eTool or similar, how the following recycled material targets are achieved for each stage of subdivision: • at least 20% recycled content used in bitumen or alternative road surface material during construction; • at least 30% recycled content within concrete used within construction; • at least 30% recycled content of pipes used within construction; • at least 10% recycled content of road base used within construction; • at least 70% recycled content within street furniture; and • at least 90% recycled or reused materials within construction materials.	To maximise resource recovery and recycling during construction phase.	UGZ Schedule: Requirements for permit (sec 4.0 – Circular Economy) AMENDED A permit for [insert] must include the following condition: Unless otherwise approved in writing by the responsible authority, prior to the issue of a Statement of Compliance for the first stage of subdivision, the permit holder must demonstrate through ISCA Materials Calculator 2.1 or other similar tool that the Objectives of 3.7 (Circular Economy) of the Creamery Road Precinct Structure Plan have been achieved.	DELETE	There are a number of challenges with the inclusion of specific % requirements as part of the propose planning scheme controls, including: • There is not yet any established agreed base case from which to measure a % reduction in a consistent manner. • There is not yet clarity as to where the management of embodied carbon sits (i.e. is it an Australian Standard, external tools, the building regulations or planning) – R105. • The ability for local developers to source materials required to meet standard is not yet understood • The cost implications of local developers meet standard is not yet understood However, given the stated objectives relating to zero carbon, requiring consideration and identification of areas where reductions in the emission intensity of materials can be achieved is reasonable. Specific percentage target (as identified in the current standard) could be included in associated guidance

				material prepared to the development industry as preferred targets, alongside resources to assist the development community in understanding how they can reduce their embodied carbon emissions.
		As above	NEW R (X) Prior to the certification of a plan of subdivision for the first stage of subdivision, the permit holder must demonstrate, through ISCA Materials Calculator 2.1 or another life cycle assessment tool such as eTool or similar, how the subdivision and / or development achieves the Objectives of Section 3.7 of the Creamery Road PSP and supports a carbon neutral neighbourhood by: • Retention of existing built form or other infrastructure where reuse is feasible • Increasing the recycled content of road materials, including road base • Reducing the amount of embodied carbon in road construction • Increasing the use of recycled content in any concrete and pipes used • Reducing the amount of embodied carbon in any cement and aggregates used	It is noted that the targets previously identified still be pursued as best practice targets within an associated guideline document for developers (i.e 'Reducing the Embodied Carbon in your Subdivision'). The nexus between existing Objectives (and zero carbon / circular economy) and the last two dot points is more tenuous.

			• Significantly reducing the amount of embodied carbon in any pipes • The selection of street furniture with high levels of recycled content • The use of locally sourced materials, particularly the use of local materials for road base • Avoiding the use of timber which is not certified by the Forest Stewardship Council or Program for the Endorsement of Forest Certification • Use of materials that are certified low volatile organic compound.	
		NEW UGZ Schedule: Conditions and Requirements for permit (sec 4.0 – Construction Management Plan) (see note)	NEW R (X) Prior to the certification of a plan of subdivision for the first stage of subdivision, the permit holder must provide a Construction Management Plan which: • Demonstrates the steps being taken to reduce emissions from construction activities • Demonstrates the proposed management and recycling of construction waste in accordance with the Objectives of Section 3.7 of the Creamery Road PSP	Note: details of what should be in the construction management should be in accordance with standard CoGG approach and standard condition wording which has yet to be provided. However, CMP should address the management of construction waste and detail proposed recycling waste It is likely to aspect of construction management related to IWM could also be integrated into this condition which would also strengthen that aspect of the PSP.

			• Additional TBD (i.e. IWM related)	
PSP THEME:	Circular economy (embodied carbon)			
R105 Prior to the certification of a plan of subdivision for the first stage of subdivision, the permit holder must demonstrate, through ISCA Materials Calculator 2.1 or another life cycle assessment tool such as eTool or similar, how the following embodied carbon targets are achieved or each stage of subdivision: • at least a 60% reduction of embodied carbon in the construction of roads within subdivisions as compared to the reference case; • at least a 40% reduction in embodied carbon in cement used within construction as compared to the reference case; • at least a 20% reduction in embodied carbon in aggregates used within construction as compared to the reference case; and • a 100% reduction in embodied carbon in pipes used within construction.	To minimise levels of embodied carbon within construction materials.	As per R106	DELETE (requirement) NO CHANGE (objective)	As above Objective should be retained.
G61 Retention of existing buildings, infrastructure and other structures is encouraged, where adaptive reuse is possible.		As above	DELETE	As above
PSP THEME:	Circular economy (whole-of-lifecycle approach)			
R107 Prior to the certification of a plan of subdivision for the first stage of subdivision, the permit holder must demonstrate, through ISCA	To encourage a whole-of-lifecycle approach towards buildings and	As above	DELETE	As above Objective should be retained.

Materials Calculator 2.1 or another life cycle assessment tool such as eTool or similar, how the following locally sourced material targets are achieved for each stage of subdivision: • at least 80% locally sourced (within 50km) quarried road base used within construction; and • at least 30% locally sourced (within 50km) recycled material used during construction.	infrastructure, including use of high-quality, locally sourced construction materials with a long lifespan and materials that can be easily recycled or sustainably disposed of at the end of their life.			
R108 Prior to the certification of a plan of subdivision for the first stage of subdivision, the permit holder must demonstrate how the following construction materials targets are achieved for each stage of subdivision: • 100% of timber used within construction is certified by Forest Stewardship Council (FSC) or Program for the Endorsement of Forest Certification (PEFC); and • at minimum 95% materials used during construction are certified low volatile organic compound (VOC).		As above	DELETE	As above

END

APPENDIX TWO: PERMIT TRIGGERS TABLE

CREAMERY ROAD PSP – PSP TYPOLOGIES FLOWCHART

There are a number of different types of land use identified in the PSP. This Table identified the link between the terminology used in the PSP to describe various land uses/development typologies to the permit trigger (for both initial subdivision, and for development) and then to the applied zone (and what relevant associated particular provisions may then also apply). For some key uses other relevant policy is also flagged. Note – this table is limited to relevant provisions, and is not a comprehensive list of all applicable provisions.

PSP T3: Housing Delivery Guide Land Use	Housing Typology	Applied Zone	Applied Trigger: Subdivision	Applied Trigger(s): Buildings and Works	Likely Applicable Particular Provisions	Likely Particularly Relevant 'L' Policies	Likely Particularly Relevant 'L' Policies
Housing within the Neighbourhood Activity Centre (NAC)	Compact housing forms, shop top housing and apartments are encouraged which integrate with the retail and commercial uses.	Commercial 1 Zone	Clause 34.01-3 (Subdivision)	Clause 34.01-4 (Buildings and Works)	Clause 52.06 (Car Parking) Clause 52.20 (Victoria's Big Housing Build) Clause 52.34 (Bicycle Facilities) Clause 55 (Two or More Dwellings on a Lot) Clause 56 (Residential Subdivision) Clause 58 (Apartment Developments)	Clause 11.02-2L (Northern and Western Geelong Growth Areas) Clause 11.03-1L (Activity centres in Greater Geelong) Clause 15.01-1L-01 (Development in activity centres) Clause 15.01-2L (Environmentally sustainable development) Clause 19.03-3L (Integrated water management)	Clause 11.03-1S (Activity centres) Clause 15.01-1S (Urban design) Clause 15.01-2S (Building design) Clause 15.01-35 (Subdivision design) Clause 15.01-4S (Healthy neighbourhoods) Clause 18.01-1S (Land use and transport integration) Clause 18.01-3S (Sustainable and safe transport) Clause 18.02-1S (Walking) Clause 18.02-2S (Cycling)

							Clause 18.02-3S (Public transport) Clause 19.01-1S (Energy supply) Clause 19.01-2S (Renewable energy) Clause 19.03-3S (Integrated water management) Clause 19.03-5S (Waste and resource recovery)
Integrated Development Areas (IDA)	Housing typologies will vary in this area to include a range of types and forms to create diversity and support medium to high residential densities. Types of housing encouraged include low-rise apartments, townhouses, soho-type dwellings and co-housing.	Residential Growth Zone	Clause 32.07-3 (Subdivision)	Clause 32.07-4 (Construction and extension of one dwelling on a lot) Clause 32.07-5 (Construction and extension of two or more dwellings on a lot, dwellings on common property and residential buildings) Clause 32.07-7 (Residential aged care facility) Clause 32.07-8 (Buildings and works associated with a Section 2 use)	Clause 52.06 (Car Parking) Clause 52.20 (Victoria's Big Housing Build) Clause 52.34 (Bicycle Facilities) Clause 53.20 Housing by or on behalf of the Director of Housing) Clause 54 (One Dwelling on a Lot) Clause 55 (Two or More Dwellings on a Lot) Clause 56 (Residential Subdivision) Clause 58 (Apartment Developments) Clause 59 VicSmart Applications and Requirements)	Clause 11.02-2L (Northern and Western Geelong Growth Areas) Clause 11.03-1L (Activity centres in Greater Geelong) Clause 15.01-1L-01 (Development in activity centres) Clause 15.01-2L (Environmentally sustainable development) Clause 19.03-3L (Integrated water management)	As above.

Integrated Development Transition Area	Housing typologies will support medium to high residential densities. Types of housing encouraged include town houses, micro-lots and duplexes	Residential Growth Zone	Clause 32.07-3 (Subdivision)	Clause 32.07-4 (Construction and extension of one dwelling on a lot) Clause 32.07-5 (Construction and extension of two or more dwellings on a lot, dwellings on common property and residential buildings) Clause 32.07-7 (Residential aged care facility) Clause 32.07-8 (Buildings and works associated with a Section 2 use)	Clause 52.06 (Car Parking) Clause 52.20 (Victoria's Big Housing Build) Clause 52.34 (Bicycle Facilities) Clause 53.01 (Public Open Space Contribution and Subdivision) Clause 53.20 Housing by or on behalf of the Director of Housing) Clause 54 (One Dwelling on a Lot) Clause 55 (Two or More Dwellings on a Lot) Clause 56 (Residential Subdivision) Clause 58 (Apartment Developments) Clause 59 VicSmart Applications and Requirements)	Clause 11.01-1L-01 (Settlement Geelong) Clause 11.02-2L (Northern and Western Geelong Growth Areas) Clause 11.02-3L (Sequencing of development) Clause 15.01-2L (Environmentally sustainable development) Clause 16.01-1L-01 (Integrated housing and housing diversity) Clause 19.03-2L (Infrastructure planning, design and construction) Clause 19.03-3L (Integrated water management)	As above.
Integrated Development Mixed Use Area	Mixed-use developments that incorporate non-residential uses at the ground floor and shop top housing are encouraged.	Mixed Use Zone	Clause 32.04-4 (Subdivision)	Clause 32.04-5 (Construction and extension of one dwelling on a lot) Clause 32.04-6 (Construction and extension of two or more dwellings on a lot, dwellings on common	As above	As above	As above

				property and residential buildings) Clause 32.04-8 (Residential aged care facility) Clause 32.04-9 (Buildings and works associated with a Section 2 use)			
Standard Residential	Types of housing encouraged are single dwellings, townhouses, detached housing and semi-detached housing (2-3 storeys).	General Residential Zone Schedule 1	Clause 32.08-3 (Subdivision)	Clause 32.08-5 (Construction and extension of one dwelling on a lot) Clause 32.08-6 (Construction and extension of two or more dwellings on a lot, dwellings on common property and residential buildings) Clause 32.08-8 (Residential aged care facility) Clause 32.08-9 (Buildings and works associated with a Section 2 use)	Clause 52.06 (Car Parking) Clause 52.20 (Victoria's Big Housing Build) Clause 52.34 (Bicycle Facilities) Clause 53.20 Housing by or on behalf of the Director of Housing) Clause 54 (One Dwelling on a Lot) Clause 55 (Two or More Dwellings on a Lot) Clause 56 (Residential Subdivision) Clause 59 VicSmart Applications and Requirements)	Clause 11.02-2L (Northern and Western Geelong Growth Areas) Clause 11.02-3L (Sequencing of development) Clause 15.01-2L (Environmentally sustainable development) Clause 16.01-1L-01 (Integrated housing and housing diversity) Clause 19.03-2L (Infrastructure planning, design and construction) Clause 19.03-3L (Integrated water management)	Clause 15.01-2S (Building design) Clause 15.01-35 (Subdivision design) Clause 15.01-4S (Healthy neighbourhoods) Clause 19.01-2S (Renewable energy) Clause 19.03-3S (Integrated water management) Clause 19.03-5S (Waste and resource recovery)
Rural Living	Additional dwellings and further subdivision is discouraged. The Rural Living Zone generally allows single dwellings	Rural Living Zone	Clause 35.03-3 (Subdivision)	Clause 35.3-4 (Buildings and Works)	Clause 52.06 (Car Parking) Clause 52.17 (Native Vegetation)	Clause 11.02-2L (Northern and Western Geelong Growth Areas) Clause 11.02-3L (Sequencing of development)	Clause 11.01-1S (Settlement) Clause 12.01-2S (Native vegetation management)

	on lots, extensions, and some discretionary uses.				Clause 52.20 (Victoria's Big Housing Build) Clause 52.34 (Bicycle Facilities) Clause 54 (One Dwelling on a Lot) Clause 59 VicSmart Applications and Requirements)	Clause 13.07-1L-03 (Amenity in rural living and low density residential zones) Clause 15.01-3L (Subdivision design in low density and rural residential areas) Clause 16.01-3L (Rural residential development) Clause 19.03-3L (Integrated water management) "S&R Policies"	Clause 13.01-1S (Natural hazards and climate change) Clause 13.02-1S (Bushfire planning) Clause 14.02-1S (Catchment management and planning) Clause 15.01-2S (Building design) Clause 15.01-35 (Subdivision design) Clause 15.01-4S (Healthy neighbourhoods) Clause 16.01-1S (Housing supply) Clause 19.01-1S (Energy supply) Clause 19.01-2S (Renewable energy) Clause 19.03-3S (Integrated water management)
DEVELOPMENT SETTINGS FROM UGZ SCHEDULE							
Activity Centre	The NAC will serve as the retail core of the precinct supported by a full line supermarket, specialty retail and other ancillary uses and	Commercial 1 Zone	Clause 34.01-3 (Subdivision)	Clause 34.01-4 (Buildings and Works)	See above sections for relevant provisions	See above sections for relevant provisions	See above sections for relevant provisions

	support a substantial component of housing The bulky goods area will cater to large format retail uses such as furniture, white goods, electrical, lighting, hardware and/or garden supplies, uses more reliant on the private vehicle and access to major roads.						
Community Facility	Creamery Road PSP will support….. an integrated children's centre, an indoor sport centre, a multipurpose community centre and an emergency hub	Public Use Zone – Schedule 6 - Local Government	Clause 36.01-2 (Permit requirement)	NO TRIGGER FOR BUILDINGS AND WORKS Pursuant to Clause 36.01-2, a permit is only required for buildings and works associated with Section 2 uses. As currently drafted, there are no uses listed in Section 2. The uses as specified in the PSP would fall within the broad scope of "local government" (active question however regarding whether this would be the case for the proposed 'emergency hub'), so would be Section 1 uses which do not trigger a permit for either use or buildings and works.	See above sections for relevant provisions	See above sections for relevant provisions	See above sections for relevant provisions
School	Creamery Road PSP will support two government primary schools	General Residential Zone Schedule 1	Clause 32.08-3 (Subdivision)	Clause 32.08-9 (Buildings and works associated with a Section 2 use)	See above sections for relevant provisions	See above sections for relevant provisions	See above sections for relevant provisions