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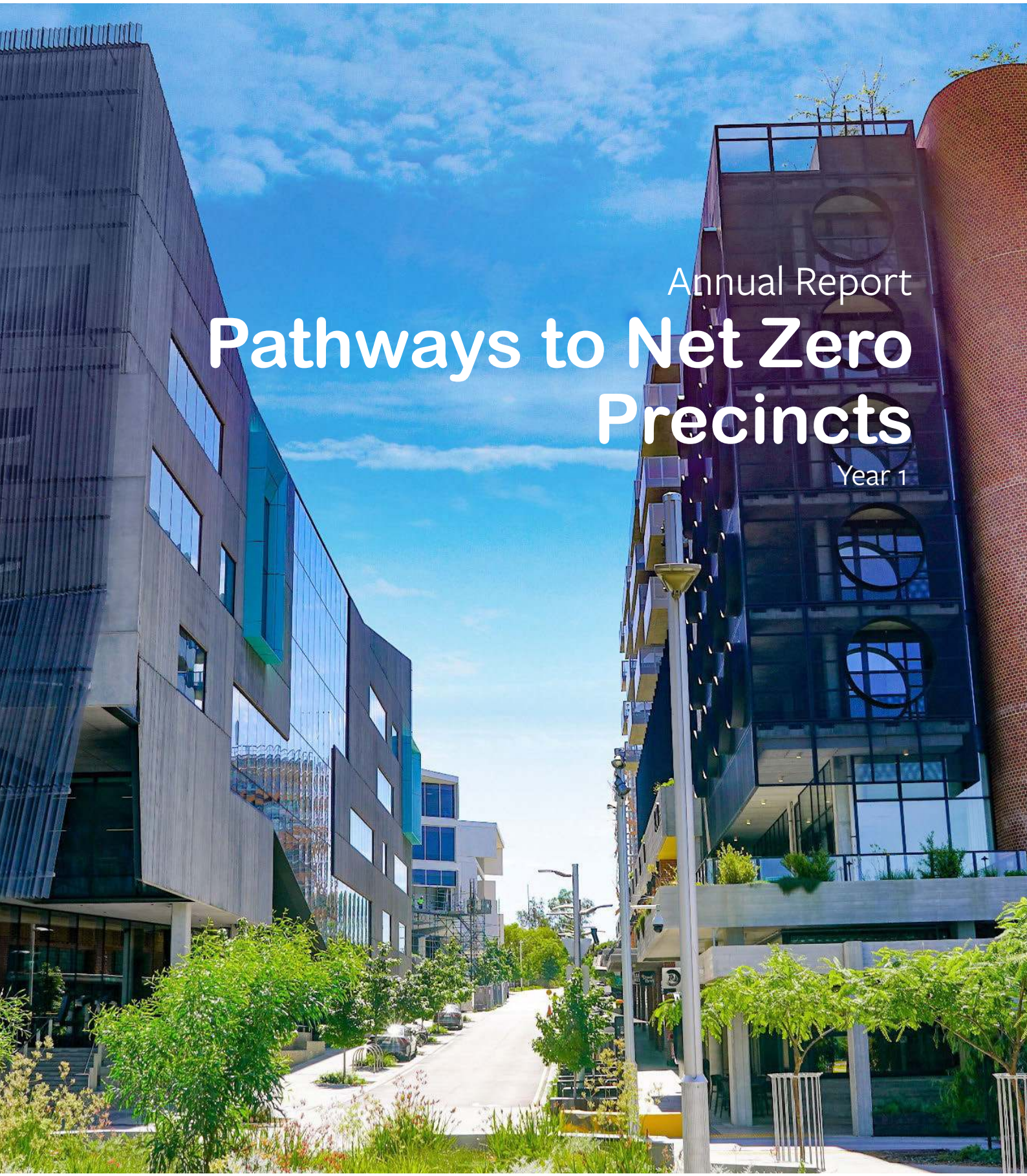

Annual Report

Pathways to Net Zero Precincts

Year 1

Australian Government
Department of Industry, Science and Resources

Cooperative Research Centres Program

Annual Report (Year 1, Milestone 4)

RACE for Change

Pathways to Net Zero Precincts - Embedding Research to Accelerate Adoption

Project Code: 22.E2.S.0486

Envision Tomorrow Australia - An Urban Footprint Model for Australian Precincts*

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* A Research Activity of Pathways to Net Zero Precincts

November 2024

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Project Partners

Curtin's support includes the CISCO Curtin Centre for Future Networks

Acknowledgement of Country

The authors of this report would like to respectfully acknowledge the Traditional Owners of the ancestral lands throughout Australia and their connection to land, sea and community. We recognise their continuing connection to the land, waters, and culture and pay our respects to them, their cultures and to their Elders past, present, and emerging.

What is RACE for 2030?
Reliable, Affordable Clean Energy for 2030 (RACE for 2030) is an innovative cooperative research centre for energy and carbon transition. We were funded with $68.5 million of Commonwealth funds and commitments of $280 million of cash and in-kind contributions from our partners. Our aim is to deliver $3.8 billion of cumulative energy productivity benefits and 20 megatons of cumulative carbon emission savings by 2030. racefor2030.com.au

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Executive Summary

This Annual Report outlines the progress and strategic direction of research activities in the first 12 months of the RACE for 2030 Cooperative Research Centre Pathways to Net Zero Precincts (NZP) project as we look to accelerate the transition towards net zero precincts in our cities. Research is structured across four pathways: Certification, Consumer Energy Resources (CER) and Grid Integration, Governance Practices, and Urban Design. The last pathway was added with extra funding to take an urban scenario planning tool developed in the US (called Envision Tomorrow ET) and adapt it to the Australian context (ET-Oz). This is now integrated into the NZP project as a tool for Urban Design. The Report covers six case studies in Perth: the Knutsford Urban Regeneration Precinct (which includes the learnings from the nearby WGV development), Rivermark, Curtin University Bentley Campus, Alkimos Central, Peel Business Park, and Roe Highway Logistics Park. The Curtin case study also includes a Digital Twin project focussing on building energy predictive decarbonisation and sensors for real time operational decisions. Two additional case studies that are in the process of being incorporated into the project will be briefly outlined, including Rundle Mall in Adelaide (led by the University of South Australia) and the Sunshine Precinct in Melbourne (led by RMIT). Connections between these projects and the Perth case studies are beginning to emerge and will be a key focus of collaborative research activities in Year 2 of the project. Further case studies are expected to be included as the project progresses.

Publicly available information on the Perth case studies has been collated. Detailed research on the literature, thesis questions and data collection has begun, with progress outlined in the Report for each pathway. Research highlights have been the NZP Certification Forum with its innovative approach to developing a nationally significant paper through the more than 200 virtual attendees and their detailed comments; CER interviews with key industry people that show strong support for the approach being taken on net zero precincts with recognition that a new model for how grids work was emerging; the CER Digital Twin tool has provided key data to show that decarbonisation of buildings can be effectively designed and built and can be monitored in real time using sensors linked to the model; Governance Practice insights from a survey of project case studies especially about how to better manage shared batteries showed that net zero meant a lot to end-users but that much more needed to be done about managing the new shared technologies, perhaps linked to land titles' regulation; the first stage of ET-Oz applied to WGV showed that land value created by the net zero attributes was significantly higher than in the Perth region where similar buildings were built without these attributes. All of these factors will be incorporated next into a new phase of research using ET-Oz on the Knutsford project where scenarios will be conducted on the large Swanbourne Street Structure Plan site, using data from WGV and other parameters related to each pathway, to elaborate how much density and how much affordable housing, could be achieved in this large urban development site that is seeking to demonstrate net zero attributes.

There are now over 20 researchers involved in this project. PhD researchers have achieved their first milestones and have obtained the necessary research ethics approvals. A top-up PhD scholarship has provided important data on green infrastructure carbon mitigation in the Curtin Bentley Campus case study. The Project Steering Group (PSG) is highly engaged and Industry Reference Groups (IRGs) for each of the pathways are established and operating. Importantly, the PSG and IRGs have provided significant input and guidance to each part of the NZP project.

Knowledge sharing and other associated communications activities have already given the NZP project a high profile. The presence of a project website has enabled significant digital traffic, particularly through the introductory project video. The first of two case study 'video vignettes' have been produced and will be released in early 2025. Planning is underway for additional video production in early 2025. The first of the NZP National Industry Forums was held in November 2024 focusing on Net Zero Certification for Urban Precincts, with strong participation from industry, government and academia. A Forum Paper was the first publication from this RACE project and is in Appendix 1.

At the end of Year 1, the budget is tracking well with the PSG partners committed to remaining closely involved. The NZP project is transitioning from its initial establishment phase to the generation of insights gleaned from the case studies, including refining pathway synthesis opportunities and onboarding of new east coast case studies.

1. Project Introduction and Research Highlights

Pathways to Net Zero Precincts is a three-year research project that aims to identify, develop and implement innovative strategies for transitioning urban precincts towards net zero emissions. As a collaborative initiative between Curtin University, the RACE for 2030 Cooperative Research Centre (RACE) and a consortium of industry and research partners from across the country, the project is drawing on a range of case studies as a testing ground for real-world interventions.

With urban centres responsible for a significant portion of the world's greenhouse gas emissions, precincts are important places to innovate to achieve net zero outcomes. Their practical scale allows technologies such as solar PV, batteries and electric vehicles to be readily incorporated. With good governance practices, these technologies can operate reliably and affordably at the precinct scale. Precincts are also a common scale for urban development, or re-development, providing opportunities to integrate net zero measures in project delivery.

This is the first Annual Report (the Report) of the Net Zero Precincts (NZP) project. It covers both NZP and Envision Tomorrow Australia (ET-Oz) projects. The ET-Oz project started one month after NZP as a subsidiary research activity, and the two are now merging their research and reporting responsibilities.

The research agenda of NZP ET-Oz is based on the need to establish net zero in a spatial planning context that can enable the many dimensions of urban planning decarbonisation to be unlocked. By adopting a precinct case study approach, the project focuses on four pathways to transition to net zero in the built environment: Certification, Consumer Energy Resources (CER) and Grid Integration, Governance Practices, and Urban Design incorporating scenario modelling using ET-Oz.

The Report begins with an overview of the research focus within each pathway and some Research Highlights (Section 1) followed by a broader look at emerging technical and regulatory issues (Section 2) and a summary of preliminary findings, issues and difficulties (Section 3). Knowledge sharing activities are reported (Section 4) and the direction for research activities across the case studies provided (Section 5). An overview of project management and team coordination is outlined (Section 6), before some conclusions. Supporting material is provided in the Appendix, and includes information required by RACE for the Project Year 1 Stage Gate Review.

The Report focuses on the six case studies in the Perth-Peel region (the Knutsford Urban Regeneration Precinct, Rivermark, Curtin University Bentley Campus, Alkimos Central, Roe Highway Logistics Park and Peel Business Park) that have been proceeding for most of the past year. One other case study, the Caulfield-Rowville Link in Melbourne, is being examined as part of ET-Oz, and work has begun on how to integrate new dimensions in the ET-Oz model using green infrastructure (with a new top-up PhD), public transport and reduced car dependence. Two new case studies, Rundle Mall in Adelaide (led by the University of South Australia) and the Sunshine Precinct in Melbourne (led by RMIT) are commencing and will be captured by research synthesis and knowledge-sharing activities going forward.

What is a Precinct?

A precinct is a unified area of urban land with a clearly defined boundary, synonymous with neighbourhood or district. A typical precinct will contain private and public land with shared infrastructure[1].

What is Net Zero?

Net Zero is defined by the Paris Agreement, which was signed by 197 nations in 2016, as a state where the amount of greenhouse gases released into the atmosphere is balanced by the amount removed. This can be achieved by reducing human-caused emissions and removing carbon from the atmosphere through natural processes or technologies[2].

1 Thompson, G. Newton, P. Newman, P. & Byrne. J. (2019). Guide to Low Carbon Precincts. Cooperative Research Centre for Low Carbon Living. Sydney, Australia

2 Intergovernmental Panel on Climate Change (IPCC), (2018). Global warming of 1.5°C: Summary for policymakers. Available at: https://www.ipcc.ch/site/assets/uploads/sites/2/2019/06/SR15_Summary_Volume_Low_Res.pdf

Research Pathway Overview

Certification
OVERVIEW

Pathways to Net Zero Precincts will use formal certification processes in the transition to net zero which set in place actions and targets based on the principles of alignment, credibility, traceability, transparency and accountability.

The net zero certification landscape is rapidly evolving to support net zero targets, regulations, and policies in the built environment. In addition to reducing overall emissions and improving energy productivity, there are also financial benefits for developers who strive for market leadership and recognition.

In the Australian urban development context, net zero is used to describe a voluntary commitment that may not be clearly defined, leading to confusion and even greenwashing. This can be minimised using a certification mechanism to calculate, verify and communicate a project or precinct's net zero status. However, revisions to existing carbon neutral and sustainability certifications for precincts are currently under review which has led to the identification of a need for working definitions and an assessment framework.

Team Members

Professorial Lead: Professor Peter Newman
Technical Lead: Dr Hugh Finn
PhD Researcher: Angelina Bowden-Jones

Our applied research, across multiple case study precincts and development types, is helping to identify the opportunities and challenges of existing certification schemes for improved transparency and credibility.

Research Question

What are the primary components that enable integrity to achieve net zero certification at the urban precinct scale?

Research Objectives

01 To develop clear working definitions of net zero and its components for urban precincts.

02 To develop a framework for assessing risks, technological uncertainty and primary components for an urban precinct to be certified as net zero.

03 To identify governance protocols that ensure integrity of the information that an urban precinct requires to be certified as net zero.

04 To use the Certification Forum as a key way to involve major stakeholders in understanding the next steps in net zero certification.

CASE STUDY Focus Area

The case studies provide a rich source of data to develop the assessment framework that will enable an urban precinct to be certified as net zero with integrity. The research explores the factors each precinct has considered as part of their journey towards net zero and the extent to which certification can play a role in that decision-making process.

The Net Zero Certification Forum was a major success in enabling the first steps towards a new net zero certification approach to be created (Box 1).

Oct 2023 - Feb 2024
Net Zero Precincts Certification Report

Feb 2024 - Feb 2027
PhD

Feb 2024 - Aug 2024
Establishment (Ethics, training, workplan)

Aug 2024 - Feb 2025
Forum (includes ethics, preparation & report)

Dec 2024 - Dec 2026
Publications submitted (Dec-24 onwards)

Feb 2025 - Dec 2026
IRG meetings - (2025 and 2026)

Box 1: The Net Zero Certification Forum

The NZP's first dedicated open industry event was the Net Zero Certification for Urban Precincts Forum, held on 28 November 2024. The Forum had 206 registrants and up to 85 persons attending online at any one time during the half-day event.

The IRG for the Certification pathway helped shape the Forum agenda, which featured presentations and panel discussions around three key themes: sustainability certifications in the built environment; global trends and Australia's response; and net zero precincts in practice.

Presenters came from industry, government, and the academic and research community, including the Green Building Council of Australia, Clean Energy Finance Corporation, Urban Development Institute of Australia, and Hesperia.

The Forum was designed as an innovation process to bring knowledge holders from industry, government, and the academic community together to share information, discuss views, and create new understandings about how net zero certification can enable and assure the net zero transition at the precinct scale.

That innovation process began in a foundational pre-Forum paper that addressed key questions for the role of certification in transitioning urban precincts towards net zero emissions.

Angelina Bowden-Jones (PhD student, Certification pathway) built upon the pre-Forum paper in an opening presentation at the Forum. Angelina described the trajectory to net zero certification in Australia, which includes the development of sustainability certifications in Australia over the last two decades, the introduction post-Paris Agreement of international standards and guidelines for net zero, recent anti-greenwashing enforcement by Australian regulators, and the introduction this year of a national climate-related disclosures regime.

The Forum presentations and discussions addressed some of the key issues for emerging net zero transition, including the quality of emissions data available for precincts, the tools to analyse and evaluate precinct emissions (e.g. ratings and life cycle assessment tools), the rules that apply to claims and disclosures about precinct emissions, and the third-party assurance, validation, or certification processes to assure the credibility of net zero-related claims for precincts.

The Forum proceedings were recorded and have been made available on the NZP website so as to be accessible as an industry resource.

Research:

The research narrative on certification is focused on the extraordinary changes happening locally and globally on how to prevent greenwashing by creating more integrity in the pursuit of net zero. The narrative was developed from a review of the literature that has led to the drafting of an academic publication.

Research Outcomes:

A paper 'Net Zero Certification for Urban Precincts' was completed for the Certification Forum (see Appendix 1) containing five core questions that were addressed during the virtual event on November 28. In 2025 the Forum paper will be completed as a major contribution toward the RACE for 2030 agenda for net zero. It will provide a foundation for further integrated research into case studies and the other PhDs across the NZP project. Five other papers have been outlined as part of the Milestone 1 (M1) process. Several will be jointly authored with other pathway researchers.

CER and Grid Integration

OVERVIEW

Pathways to Net Zero Precincts will address how Consumer Energy Resource technologies and services will actively support grid stability, efficiency and economic viability for consumers in precincts and for utilities.

As the energy system transitions to renewable energy significant changes are underway in how, where, and by whom energy is generated, stored, and used. Consumers are increasingly owning energy generation and storage resources, driving rapid changes in the power grid or as decentralised models. This requires new tools, technologies, regulations, and business models for generating, owning and sharing power.

The Australian Energy Regulator (AER) defines these Consumer Energy Resources (CER) as "distributed energy resources that are owned or leased by residential and small-business consumers (or groups of consumers) that: generate or store electricity, or can alter demand in response to external signals, and includes consumer loads that are flexible and efficiently optimised either through automation or direct behavioural response"[3]. This can include solar panels, batteries, electric vehicles (EVs) and energy management systems.

The CER and Grid Integration pathway is concerned with how the uptake of such CERs can be accelerated at the precinct scale and, where appropriate, more seamlessly integrated with the grid. To be effective, it is expected that these technologies will be integrated at the precinct-scale system level to provide both cost and emissions savings across the different typologies of residential, mixed-use and light industrial precincts in cities and regions.

Many jurisdictions are actively working on integrating consumer energy resources. Internationally, the EU and the US, for example, are promoting CERs to accelerate the transition to clean energy systems.

Team Members

Professorial Lead: Professor Peta Ashworth
Technical Lead: Dr Dean Economou
PhD Researcher: Aditi Varma

Research in this pathway aims to identify the best mix of CER technologies for scale and type of precinct and how best to integrate these into the grid or not. Integrating consumer energy resources (CER) into the grid allows consumer-owned assets like solar panels, batteries, and electric vehicles to actively support grid stability and efficiency, transforming consumers into key contributors to a resilient, flexible, and low-carbon energy system. This will be done by analysing system performance for repeatability and scalability; testing tools that help precinct-scale resourcing decisions; and identifying opportunities, barriers and impacts of these changes on emissions reduction and business operations.

Research Questions

1. What are system design and performance challenges and opportunities for CER and grid integration at different scales of NZPs?
2. How can we increase uptake of CER in real-world project delivery and operation?
3. What are the motivations or disincentives for CER and grid integration across different scales of NZPs?

Research Objectives

01 To translate the lessons learned from the research to industry and policy practitioners.

02 Guide delivery of NZPs at different scales by developing a manual of practice for precinct stakeholders.

03 Identify the accelerators and barriers to increased uptake of CER in precincts.

CASE STUDY Focus Area

The next phase of research will build on the analysis of baseline interviews with stakeholders and experts conducted in Year 1, as well as the technical data gathered for each case study (Box 2). The literature review will provide a national and international perspective of the current state of play for CER and grid integration, while the interviews give us insight into the challenges facing practitioners in this field. Our aim is to use these to better understand the technical, economic and regulatory context for the uptake of CER.

3 AER - Consumer Energy Resources Strategy - 2023. Available at: https://www.aer.gov.au/documents/aer-consumer-energy-resources-strategy-april-2023

Box 2: Early Stakeholder CER Insights from Interviews

The CER and Grid Integration pathway is conducting primary research by interviewing precinct stakeholders encompassing investors, developers, managers, planners, regulators, and energy and technology providers.

Several themes and rich insights are emerging from the interviews as we proceed with formal analysis. First, **Precincts as Platforms for Demonstration and Learning** where new CER technologies can be tested and refined. According to one stakeholder:

"Precincts offer a unique opportunity to aggregate Distributed Energy Resources like solar and batteries, allowing for collective optimisation that can serve as a model for broader adoption."

Second, CER also offers **Economic and Environmental Benefits for Precincts**, at the same time supporting the broader grid with additional capacity, reducing reliance on traditional energy sources, at lower cost and supporting sustainability goals. In the words of another stakeholder:

"CER plays into this enormous opportunity to actually be capacity providing support at a system level while delivering cost reduction and decarbonization benefits at the precinct scale."

A third theme is **Precincts as Platforms for Demonstration and Learning** where new CER technologies can be tested and refined for replication.

One stakeholder noted:

"Precincts offer a unique opportunity to aggregate DERs like solar and batteries, allowing for collective optimization that can serve as a model for broader adoption."

Fourth, the **Role of CER in Reshaping Energy Dynamics** is seen as fundamental:

"This is now the realisation of the full disruption of the energy value chain, to the point that traditional owners of generation and transportation will become increasingly bit part players, whereas the dominant force and energy producers and managers become CER owners in the distribution network."

Other themes include the **Challenges in Integration Across Precincts** and the need for **Stakeholder Synergy in Precinct Planning** reflecting the complexity of overcoming technical, governance and financial challenges to ensure all stakeholders, including the community and grid operators, see value:

"Precincts require cross-stakeholder collaboration — government, utilities, and private developers — to successfully integrate CER technologies into energy systems."

We look forward to further insights as these interviews continue to inform our next stage of quantitative research.

The Digital Twin research activity sits within the CER and Grid Integration pathway and has focussed on energy management on Curtin University's Bentley campus, to support Curtin's decarbonisation plan. The early research highlights from the Digital Twin pilot are presented in Box 3.

Box 3: Digital Twin Pilot on Curtin Campus

Digital Twins—virtual replicas of physical assets—are tools that can help transform how Net Zero Precincts are designed, managed, and optimized. The Digital Twin developed at Curtin can now leverage real-time data to monitor and simulate building's operational performance, reduce carbon footprints, and enhance energy efficiency for long-term sustainability.

The initial proof-of-concept work integrates machine learning models with the Digital Twin model to deliver actionable insights that can enable sensors to provide real time monitoring of energy use. The team developed seven proof-of-concept projects using advanced Digital Twin platforms. These included 2D and 3D visualizations via **Azure Digital Twins**, IoT sensor integration using **Microsoft Azure IoT Hub**, and an immersive 3D fly-through of the TL Robertson Library (Building 215) created with **AWS IoT Twin Maker**. Unity's gaming engine was also explored for implementation. The team concluded with a comparative analysis of Digital Twin platforms, evaluating scalability, openness, pricing, and data integration capabilities, positioning **AWS IoT Twin Maker** as a preferred choice.

Using the **Random Forest Regression model**, researchers projected energy consumption, CO2 emissions, and costs for Curtin Buildings 215 and 418 (School of Design and Built Environment) by 2025. For example, incorporating 15% renewable energy is predicted to reduce CO2 emissions to 56,669 kg and energy costs to $35,483 for Building 215. By 2030, with 90% renewable energy, CO2 emissions for the same building could drop to 9,235 kg and costs to $9,502. These findings illustrate the powerful role renewables can play in driving sustainability and cost efficiency.

This work establishes a roadmap for using Digital Twin technology to achieve net zero goals and build resilient, future-ready precincts.

Research:

The initial research narrative has been developed to understand the required technologies to integrate CER and grid systems to achieve desirable economic and environmental outcomes, what are the motivations and disincentives for stakeholders to participate in NZPs, and how we can inform and enable practitioners in this transition. Ben James' PhD work is mainly focused on grid integration issues from the utility's perspective.

Interviews began with those directly involved in the case studies and are now including a broader group, as suggested by the IRG (see Box 2). Once interviews are complete, a thematic analysis with NVivo will be undertaken. Following each interview, each stakeholder is being asked to identify and provide, if possible, quantitative data that may be relevant to the research. Post each interview, we are asking each stakeholder what data relevant to our research may be available. An issue emerged regarding land title types directly impacting the development of CER and grid integration, suggesting a potential focus for an upcoming paper. This topic is expected to align with the Governance pathway. We also encountered the issue of land title types directly affecting the kind of CER and grid integration that can developed due to regulatory frameworks, and this is likely to become a focus for a paper in conjunction with the researchers from the Governance Practices pathway.

The Digital Twin project at Curtin focused on developing a smart, energy-efficient precinct at Curtin using digital twin technology (see Box 3). Using real-time data from sensors (people, CO2, temperature) and historical data from the energy management system, virtual real-time representations of physical assets are created. This provides insights into how best to integrate and optimise renewable energy assets in the context of energy use, movement of people, efficient HVAC, and CO2 emission reduction. The late start of the CER and Grid Integration PhD has, to some extent, been balanced by the addition of Ben James and the Digital Twin projects with their grid integration insights.

Research Outcomes:

Four papers are underway in Ben James' thesis and one is published. Interviews with stakeholders in the CER and grid integration space are underway, including key people for each of the case studies and those in the grid. Interviews will be formally analysed using NVivo, but already a theme is emerging of considerable complexity in navigating the non-technological aspects of CER integration.

Governance Practices
OVERVIEW

Pathways to Net Zero Precincts will synthesise governance practices, processes, and policies to help facilitate new, more inclusive, and transformative ways to help create, shape and manage precincts, with their social and legal actors, in the transition to net zero.

How stakeholders use, interact with and make decisions about the infrastructure and resources they use is a critical and often overlooked aspect of the energy transition. This pathway examines how end-users and other stakeholders are involved in governance throughout the NZP lifecycle. The research explores people-oriented dimensions of governance practices, such as inclusive participation, deliberative collaborative governance, energy literacy, effective technology transfer and uptake, connection to place, and commitment to net zero.

Precincts offer a practical scale for building and sharing consumer energy resources. However, industry, regulators, and the wider community do not yet have well-developed practices for embracing shared services nor for managing the related local energy governance requirements at the precinct scale, particularly when most precincts are also integrated into the larger grid that stretches beyond their immediate boundaries.

Team Members

Professorial Lead: Professor Petra Tschakert
Technical Lead: Margaret Gollagher
PhD Researcher: Annolies Truman

Research Questions

1. What types of visions and governance arrangements and practices are most conducive to creating and operating NZPs?
2. How can participatory governance lead to end-user empowerment and ownership of energy and other precinct sustainability services?
3. How do connection to place, community, and inclusive participation influence motivation for low-carbon and sustainability activities within precincts?
4. To what extent are low-carbon initiatives in light industrial areas transferrable to mixed-use developments, and how would governance practices need to be adjusted?
5. How can disadvantaged citizens be empowered through governance to ensure that NZPs meet their mobility needs and renewable energy aspirations?

CASE STUDY
Focus Area

Key insights from surveys of case studies' stakeholders and experts, and the literature review, will be applied to collaborative research across the WA case studies, with an in-depth analysis of governance practices in WGV and other residential precincts, to be further enriched by interviews in early 2025 and followed by small group deliberations between stakeholders from each of the case studies. Local applications of how net zero can work best for those case studies will be sought, collaborating with project partners in the eastern states' case studies, along with lessons from such applications elsewhere in net zero precincts.

Energy literacy, end-user participation, and equity have been found to be important factors of inclusive governance. This pathway is exploring these issues by investigating how prosumer and end-user needs and aspirations are and can be included in precinct planning, design, and implementation; how decisions are made about decarbonisation strategies, infrastructure, and management practices and by whom; and how to improve information sharing and technical training among NZP precinct residents and stakeholders.

Research Objective

01 To show how governance of NZPs enables net zero goals, facilitates effective technology transfer, and enhances end-user participation.

Research Methods

The research methods for this pathway research and the PhD research are as follows: an online baseline survey and semi-structured interviews involving stakeholders from all WA case studies; small group deliberative stakeholder and resident workshops; action research in which governance frameworks are tested through deliberative, collaborative processes with case study participants; an autoethnographic account of the PhD student's experience as a resident in WGV and how this translates to learnings for the Knutsford Urban Regeneration Precinct and other case studies and pathways; and triangulation of self-reported, baseline and quarterly utility data. (See Box 4)

May 2024 - Oct 2024
Establishment (Ethics, training, workplan)

Jun 2024 - Oct 2026
PhD

Jun 2024 - Nov 2024
Governance literature review (PhD and Pathway)

Jun 2024 - Nov 2024
IRG meetings every 4 months

Oct 2024 - Feb 2025
Case study online survey synthesis and report (Pathway)

Feb 2025 - Aug 2026
Publications submitted (Feb 25 x 2, Apr 25, Aug 25, Feb-26, Aug 26)

Mar 2025 - Jul 2025
Case study deliberative workshops - all case studies except WGV (Pathway)

Aug 2025 - Dic 2026
Case study interviews (Pathway)

Jan 2026 - Mar 2026
Forum (include preparation & report)

Box 4: Governance Insights from Survey

The survey, with many participants so far being >50 years, female, residents, and from WGV, has yielded our first insights across 4 main domains:

1) Precinct vision: *"It ticks all the boxes for sustainable living except perhaps light pollution and wildlife protection measures,"*, and *"I don't know what the vision is, so I can't score it."* Numerous stakeholders make decisions, for some, in ambiguous ways (e.g. *"No one knows who it is. No one even knows what net zero precinct means"*).

2) Governance: Meanings of governance ranged from *"a hierarchy of authority about how things get done"* to *"co-operative communication and democratic decision making"*, with strata management and informal processes dominating and working *"moderately well"*. Disagreements stem from *"hit[ting] roadblocks with cost and timeframe when exploring net-zero options"* and *"guidelines […] diluted over time, people don't know what they need to do"*. Conflict resolution processes are lacking.

3) Regulatory governance and commercial obligation: Green titles and strata titles are most common but ineffective in enabling collaborative decision making. From those seeking precinct certification, *"separate green titles sold out give away the power to influence operational carbon measurement and reduction"*. Working across scale *"makes it complex"*, with ESG requirements *"contentious points of sales contract negotiations"*.

4) Learning, leadership, and energy literacy: Stakeholders receive *"somewhat adequate"* information and want much more (e.g. *"better educational information about net zero"* and *"clarity over what is achievable and how we will achieve it"*) e.g. on alternative energies, waste disposal, and how to do better planning. Good leadership should *"inspire behavioural change"*, *"understanding what a net zero precinct is"*, and with accountability built on trust.

Suggestions on potential interventions: Improved governance processes with better workload distributions, fun times together, ensuring technical support, and a report on NZP governance showing what has worked and what has not and why.

Research

The research narrative in governance practices is about how net zero can become mainstreamed into the urban planning and professional practices associated with precincts, particularly how deliberative, collaborative governance could be better integrated.

WGV became an early focus of the PhD student and resident, Annolies Truman, where significant problems with net zero governance were identified in both cooperative housing and apartment complexes. A focus thus began, with IRG and PSG input, on how the Western Australian Strata Titles Act 1985 and associated regulations could be applied to these cases. This has been accompanied by a wider consideration of governance issues from the literature review.

The pathway is on track with the roll-out of the online survey to gain more nuanced insights into understandings of governance across all case study sites in WA, as well as existing governance practices, experiments with deliberative decision-making processes, and obstacles encountered. Early understandings from the site visits indicate a narrow comprehension of governance (mostly in terms of organisation and legislative requirements) with substantial opportunities for more inclusive modes of governance across the various precinct types (residential, mixed-use, light industrial). Insights gained from each will require careful discussion and analysis to avoid generalisations and find future governance models that are fit for purpose. Preliminary results from the online survey are being collated and analysed.

Research Outcomes

The team has been pursuing, and will continue to do so, reviews of the diverse literature on energy governance from various angles, ranging from micromobility in low-carbon urban environments to strata title arrangements. The detailed literature review of governance in net zero precincts for the PhD student's first milestone now forms the basis of the first governance paper. A Masters student has completed a dissertation on Governance of Ecovillages with a close discussion of WGV and SHAC, as well as broader Australian and global case studies.

Urban Design
OVERVIEW

Pathways to Net Zero Precincts will use urban design strategies and tools such as digital twins and spatial scenario modelling to achieve net zero attributes in the built environment and which also assess financial and fiscal viability.

A major activity of the urban design pathway in year one of the project is the development and application of the 'Envision Tomorrow Australia' (ET-Oz) scenario planning tool based on Envision Tomorrow (ET) which was developed for use in the United States.

ET-Oz will be an open-source tool for any Australian precinct seeking to assess different scenarios of development, especially affordable housing and including energy use and source emissions with fiscal and financial implications. The ET-Oz model is also aiming to include new elements of net zero including green infrastructure, public transport, and reduced traffic.

Team Members

Professorial Lead: Professor Reena Tiwari
Associate Professorial Lead: Ass. Prof. Mohammad Swapan
Key Researcher (GIS): Dr Yongze Song
Key Researcher (LCA): Dr. Shengping (Stephanie) Li
Technical Coordinator and PhD Researcher: Faz Ikram

It is intended that ET-Oz will support open and collaborative planning and modelling to inform the development of net zero precincts, specifically for an Australian context.

Research Questions

1. What evidence is there from global literature that urban design can significantly help to decarbonise precincts and corridors, especially through land value capture?
2. What does the literature show about the modelling tools that are in use in global cities to help decarbonise precincts and corridors and how do they compare to Envision Tomorrow (ET)?
3. What are the practical steps needed to transform the Envision Tomorrow model into an Australian tool (ET-Oz) that can assist with the scenario designs of precincts and corridors in at least three case studies?
4. Are there fiscal and financial benefits that can help to create the best precinct and corridor designs in Australian cities?
5. How are certification, CER grid integration and governance practices assisted by using ET-Oz to examine different design scenarios?

Research Objectives

01 To produce an operational model for determining net zero scenarios for precincts in Australia based on financial and sustainability outcomes as done by the American ET model.

02 To adapt the ET-Oz model to include new dimensions that include more precise public transport, reduced car dependence, green infrastructure and urban heat island effect parameters.

CASE STUDY
Focus Area

After the work is done on WGV and Knutsford, the model will be applied to corridor case studies including Curtin to Vic Park, Fremantle to Murdoch, and Caulfield to Rowville (through Monash). It is envisaged that these case studies will show how the broad policy dimensions of value capture in NZPs can be translated into practice. (See Box 5)

Jan 2024 - Oct 2024
Establishment (Ethics, training, workplan)

Feb 2024 - Nov 2026
PhDs Urban Design (Finance)

Nov 2024 - Nov 2027
Urban Design (GIS)

Oct 2024 - Dec 2024
Literature review Urban Design (Finance)

Jan 2025 - May 2025
Urban Design (GIS)

Oct 2024 - Feb 2025
Case Study Synthesis and Report

Oct 2024 - May 2026
IRG meetings

Dec 2024 - Nov 2027
Publications

Feb 2025 - May 2025
Data collection & analysis

Mar 2025 - Feb 2026
Case study tool application

Apr 2025 - Jul 2025
Forum (include preparation & report)

Apr 2025 - Feb 2026
ET-Oz demonstrations

Research

The research narrative of ET-Oz centres on creating a transformative planning tool that integrates sustainability, urban design, and financial feasibility by incorporating a valuation model, sustainability metrics and GIS scenarios.

The literature review of net zero precincts' urban design and modelling was finalised in May 2024. Workshops have been conducted throughout 2024 to enable understanding of the ET Model. They have brought a wealth of experience in urban planning from their work with the ET model in the US.

The first phase of the model on building prototypes has worked on WGV and will shift now to financial scenarios on the Swanbourne Street Structure Plan in the Knutsford Urban Regeneration Area. The addition of extra components in public transport and reduced car dependence (green infrastructure and urban heat island (with two other PhDs) are under development as part of the third stage. The links to Digital Twin research in Curtin and RMIT are beginning.

Several issues are being addressed on the integration of geospatial intelligence and valuation models and how they translate into sustainability metrics. Data access and quality are being overcome so far.

The valuation and data analysis process for ET-Oz follows a structured approach that integrates location-specific market data, building typologies, and market cycle outlooks to assess financial feasibility. The first step involves developing a Residual Land Value (RLV) model, which determines the impact of development entitlements on land value and evaluates the contribution of different building typologies to project viability. By comparing potential development scenarios, the RLV model helps quantify value variations and optimize land use decisions. Next, the Return on Investment (ROI) analysis using a discounted cash flow (DCF) model is applied to assess the financial implications of development timing, staging, and funding mechanisms. This step enables stakeholders to evaluate risk, profitability, and financing structures for proposed developments while incorporating market cycles and policy constraints.

The financial analysis extends beyond project-level feasibility to include broader fiscal impacts, such as changes in the pre- and post-development tax base, capturing key public revenue implications. These valuation outputs—RLV, ROI, and tax base projections—are then incorporated into open-source GIS spatial platforms like QGIS to visualize development scenarios. This spatial integration allows for scenario testing and optimization of land use strategies in line with net zero precinct (NZP) objectives, ensuring sustainable and commercially viable outcomes. The key focus is assessing how public policy interventions, such as affordable housing incentives, can be structured to align with market realities while maintaining economic feasibility. Through this process, ET-Oz supports evidence-based decision-making by combining valuation methodologies, financial modelling, and geospatial analysis to create actionable development strategies.

Box 5: ET-Oz and Quantifying Value of Net Zero Attributes

Net zero precinct urban design needs to be affordable and that requires an understanding of the financial viability as well as the government contributions and tax benefits from any development. ET-Oz is an urban design tool to help see whether the net zero attributes can be viable.

The first data has now been collected from ET-Oz on the WGV project which applied the data on the built form with three building types, and its net zero attributes of shared solar, batteries, EV charging, with trees saved and new public open spaces.

The key output parameters are the development costs pre-transaction after building completion compared to its current market value. They are the basis of viability in urban design as if these do not increase in value significantly then they are non-viable for developers and governments to support. WGV can then be compared to Perth growth in land overall to see whether net zero attributes make a difference in the value of the development compared to 'similar conventional development' (SCP).

The data are set out for the three building prototypes in the Table below.

	Evermore	SHAC	Gen Y	Perth Area (SCD)
Development Costs (date)	$105/m2 (2021)	$85/m2 (2018)	$165/m2 (2018)	$82/m2 (2018 - 2021)
Market Value (2024)	$188/m2	$138/m2	$288/m2	$112/m2
Differences in Values	79%	62%	75%	37%

Table: Development Costs (2018-2021) and Market Value in the developments of WGV (Evermore, SHAC and Gen Y) from ET-Oz compared to Perth land value (SCD).

The key results are that there are significant increases in value that net zero attributes have provided on the three WGV types of development (Evermore, SHAC and Gen Y). These are much greater than in Perth overall. Even SHAC with its social housing showed a significant value increase but of great significance is that Evermore which is the highest density part of WGV, increased in value by 79%.

Literature has been reviewed from around the world on how green building does enable value to increase. There are huge variations which can be expected but all the results point to a rise in value. So while these findings from ET-Oz are localised to the land economics of the Perth subregion in which WGV is located they are significant and enable the next steps of the modelling process to proceed with confidence.

In summary, based on ET-Oz modelling and backed by associated literature review, we found that net zero attributes add value to the bottom-line of urban development within the region Perth city sub region in which WGV is located. Additionally, this research will establish a process for accessing value and feasibility more broadly in similar urban settings.

Specifically the values will inform creation and testing of scenarios in the adjacent Swanbourne Street Structure Plan area in the Knutsford Urban Regeneration Precinct. This is the next stage in the trial for ET-Oz and is a much bigger urban development site. (10 times larger than WGV in area)

This will include using the ET-Oz Model RLV and ROI methods to assess financial viability and broader fiscal implications of development scenarios for the building typologies within WGV precinct and those proposed for Swanbourne Street Structure Plan area.

Qualifying Statement:

The projections and assumptions underpinning findings in the table above are based on the latest available market data from CoreLogic and Rawlinsons' Construction Cost Guide that reflect policy settings at the time of assessment.

The preliminary findings do not constitute formal financial or investment advice but serves as a strategic tool for evaluating development feasibility within the sustainability objectives of the WGV precinct and broader NZP project. The findings should be interpreted in conjunction with more detailed urban design considerations, risk analysis, and policy alignment, particularly regarding the viability of affordable housing and precinct-wide carbon reduction strategies.

Research Outcomes

Reports have been done on the ET Model Workshop in collaboration with the US partners. Additionally, a literature review on Net Zero Precinct Modelling, Data Accessibility for ET-Oz, and Financial Data for the ET-Oz Model has been completed, along with a series of technical reports that provide a comprehensive evaluation of ET's applicability within the Australian context. These have been compiled into the report Proof of Concept on ET-Oz. Five peer-reviewed papers have been outlined in the finance aspects of the project for the PhD candidate. Two papers of relevance to this pathway have been published and a textbook by Professor Newman on Net Zero Cities has been drafted for the publisher Edward Elgar.

The project activities are on schedule, and key milestones for the urban design finance pathway's deliverables have been submitted for review. The project has experienced an exponential learning curve under the guidance from Dusan Mills and the US partners, to expedite the integration of appraisal data of building typologies with GIS elements and then to transform ET into an open-source dashboard of spatial data visualisation through business intelligence platforms such as Google Looker Studio.

The two peer-reviewed articles were published to provide a preliminary foundation for the project's modelling through the 'Net Zero Corridors' concept, which emphasises a bottom-up approach to decarbonise urban power and transport systems (see Section 4). Additionally, the financial objective of the research was to unveil the land value capture and relative land value from procurement principles based on Newman's Entrepreneur Rail Model (ERM).

2. Technical and Regulatory Changes and Challenges

The landscape of urban development and how it aligns with a low-carbon future is evolving rapidly. The following section provides an overview of technical and regulatory challenges as context for the research activities being undertaken by each pathway.

Certification

Over the past 12 months, there have been numerous guidelines released, new regulations introduced, and landmark court decisions coupled with the reviews being undertaken by the certification bodies that issue the existing certifications for precincts.

The Department of Climate Change, Energy, the Environment and Water (DCCEEW) commenced their review of the Climate Active program in December 2023 in the context of the changing landscape for credible voluntary climate action. The outcomes of the review are due to be announced in 2025.

The Green Building Council Australia (GBCA) undertook a consultation process in 2023 into the next version of Green Star Communities v2 to set a pathway for the delivery of climate-positive precincts. The release of the updated Green Star Communities is expected imminently.

From an anti-greenwashing perspective, the Australian Competition and Consumer Commission (ACCC) released guidance, Making Environmental Claims: A Guide for Business, which applies to all businesses in Australia and will apply to precincts that are making net zero claims. The Australian Securities and Investment Commission (ASIC) had a very busy year with success in two landmark anti-greenwashing cases in the Federal Court in August and September 2024. ASIC also released their report showing their interventions on greenwashing misconduct covering 2023-2024 in August 2024, which provides further guidance on how entities can avoid greenwashing.

The Senate Inquiry into Greenwashing held public hearings in April and May 2024, where a number of regulatory bodies, think tanks, and independent bodies provided further context in relation to their submissions. The role of certification and its potential to enable greenwashing are featured in several submissions. The outcomes of the Senate Inquiry are expected to be released in coming months.

The Australian Accounting Standards Board (AASB) released the mandatory climate-related disclosures contained within AASB S2 Climate-related Disclosures in September 2024. These disclosures commenced on 1 January 2025 for large organisations in Australia with a phased-in approach for other organisations over the following three years. To the extent these organisations have made a net zero commitment, they will be required to report against it and disclose their progress.

At the global level, the focus has also been on anti-greenwashing and mandatory disclosures. The European Commission has proposed the Green Claims Directive which will require companies to substantiate the voluntary environmental "green" claims they make. It will also establish requirements for environmental certification schemes, including those related to net zero. The Green Claims Directive is expected to be approved in the coming months. The International Sustainability Standards Board released IFRS S2 Climate-related Disclosures in June 2023 which contains similar requirements to AASB S2.

The primary challenge for the research is the rapid rate of change leading to the need for governance, legislation and incentives. Measures have been implemented to ensure that the research is contemporary and relevant, for example, subscribing to media releases and news alerts from governments, NGOs, industry groups and academia. The key ideas above were discussed in the Certification Forum.

CER and Grid Integration

The dramatic increase in uptake of solar and wind power and subsequent variability continues to bring challenges to how we manage and transition our power systems. This is particularly clear in Australia where renewables have grown so fast in our capital cities, sometimes reaching 100% of load on sunny days, to the point where curtailment has been introduced in South Australia and Western Australia and is being considered in NSW. More nuanced dynamic export limits are in use in Queensland and utilities are exploring using Dynamic Operating Envelopes to help control variability.

Large grid-scale batteries are being commissioned across the nation as coal-fired generators continue to be decommissioned in an effort to soak up solar during the day for use in the evening peak. NSW, Victoria, the ACT and South Australia all have financially significant subsidies for residential batteries.

Consumer Energy Resources (CER) is a highly active area for strategic activity and reports from Australian industry, regulators and government.

The Clean Energy Council released its report Powering Homes, Empowering People: A National Consumer Energy Resources Roadmap (June 2024) which outlines policy priorities and recommendations to encourage CER uptake and the ensuing benefits.

The Australian Energy Regulator (AER) released its Consumer Energy Resources Strategy (April 2023) which outlines the AER's approach to regulating and promoting positive market outcomes for CER, which includes consumer-owned energy generation and storage assets like solar panels, batteries, and electric vehicles.

AEMO's report Unlocking the Full Potential of Consumer Energy Resources (August 2023) outlines steps to integrate CER into the National Energy Market (NEM), emphasising the benefits of small-scale energy resources owned by consumers. AEMO also commenced an industry co-design process to develop a national Consumer Energy Resource Data Exchange in partnership with AusNet, describing it as a key enabler for CER to be an integrated part of a customer-centric, flexible and dynamic, and data-enabled electricity system.

The Department of Climate Change, Energy, the Environment and Water (DCCEEW) released its National Consumer Energy Resources Roadmap (July 2024) which outlines a national strategy to unlock CER at scale, detailing priority reforms across consumers, technology, markets, and power system operations.

The Energy Security Board released Consumer Energy Resources and the Transformation of the NEM: Critical Priorities and Call to Action (February 2024) which calls on governments to deliver a targeted program of work in collaboration with market bodies, industry and consumer representatives, starting with convening a CER taskforce and according to priorities it has developed.

In Western Australia the DER Roadmap, released in April 2020, updated in 2024, and with guidance through to 2025, plans the integration of all distributed energy resources, including solar panels, battery storage and electric vehicles, to ensure the benefits are shared across all members of the community.

In November 2024 the Minister for Climate Change Chris Bowen announced that Standards Australia had approved the new standard for approving Vehicle-to Grid in Australia.

Governance Practices

The Western Australian Strata Titles Act 1985 is currently under review with possible implications for NZPs.

Strata management education is also under review, with associated changes required to WA's Strata Titles (General) Regulations 2019 (STGR). Landgate will be holding a public consultation process which provides an opportunity to advocate for the inclusion of net zero and sustainability training to achieve the State Government's goal of achieving an "uplift in professional knowledge and experience within our state's strata management industry[4]".

Precinct Structure Plans (PSPs) are now required to include an Energy and Greenhouse Gas Emissions (EGGE) Statement under State Planning Policy 7.2, Precinct Design Guidelines. The EGGE statement is intended to demonstrate how precinct planning and design can reduce greenhouse gas emissions and incorporate renewable energy sources. The Western Australian Department of Planning, Lands and Heritage (DPLH) advises that there is currently no specific format or approach regarding the preparation of an EGGE Statement, but they provide a guide to assess energy and greenhouse gas emissions against each of the objectives of State Planning Policy 7.2. Local governments are having to learn how to develop an effective EGGE statement as they go, and their approach is likely to continue to evolve.

One challenge is to understand how deliberative, collaborative processes can be used to enable people to try alternative governance approaches, integrated with statutory and regulatory requirements, and commercial imperatives, possibly on a specific issue to begin with, such as a Community Energy Resource (CER), and build from there. Collaborative and deliberative approaches are being planned for the use of ET-Oz in the Curtin-Vic Park corridor in early 2025.

It is both a challenge and an opportunity to explore how new and more inclusive and empowering approaches may best conform to new legislative and regulatory requirements, which may themselves change, as noted above. Governance practices must respond to the changing legislative and regulatory landscape.

Differences in governance approaches and practices will emerge between residential sites at different stages. Mixed-use precincts and industrial precincts must be recognised and their possibly unique angles to governance decision making taken onboard in local and regional governance systems.

Urban Design

The affordable housing issues continue to dominate planning and urban development agendas across Australia especially when allied with high-density assessments of proposals. The need for ET-Oz to contribute to such debates is likely to continue growing.

The valuation model for ET-Oz has reached its initial completion, establishing a simplified framework integrating financial, spatial, and sustainability metrics by using data from the WGV case study and fitting it into the US ET model. The first scenario work was done in December and corridor work on Curtin-Vic Park will begin in 2025.

The model aims to provide accurate residual land value and property valuations and a series of other sustainability parameters which can then be used in the second stage of the model where financial and sustainability parameters are created from GIS-based scenarios. The key to the first stage step, which has been found to work, is to have found good data collected from the WGV building prototypes. The model now captures diverse factors such as land use types, urban densities, infrastructure access, and environmental constraints and produces data that can be stress tested from other approaches and how the outputs compare to market conditions.

4 Landgate (2025) Strata management education changes, Government of Western Australia. Available at: https://www.landgate.wa.gov.au/strata-and-community-titles/strata-titles/strata-law-and-reform/strata-management-education-changes/?accordion=accordion051832bb21ce4700af0bbc51d23d5208.

The preliminary results from this valuation model are currently undergoing a comparative analysis with existing industry standards. The core idea behind the modelling is how to be able to calculate the amount of affordable housing that could be included in the different scenarios for urban development on the site as well as their carbon and sustainability outcomes. Residual land value is the mechanism used in the development industry to make such assessments of potential scenarios for housing, including affordable housing, and this model will enable such work to be done more rapidly and more clearly providing all relevant data outputs.

The next stage process aims to validate or stress test the model's accuracy, adaptability, and effectiveness in projecting financial outcomes while considering urban design and carbon reduction objectives. Initial indications suggest alignment with industry benchmarks, but further analysis will refine the model to ensure its robustness and applicability across different precincts and development scenarios and will require applications of 'painting' GIS elements.

Dr Ivana Ivanova and Dr Song Yong Tze have provided technical guidance on the integrative aspect of GIS and the nexus to value capture methodology. They have shown that data collected should be simplified into data visualisation platforms and connected into the GIS component of the case studies through SHP files. Database and visualisation platforms such as Google Looker Studio and Microsoft Power BI can generate such features. However, Power BI will no longer be supported after May 2024 by Microsoft. Hence, the cloud-based Looker application appears be a suitable alternative.

The third stage of the modelling work will be about net zero corridors as outlined in the Project Plan. This requires additions to the ET model as a series of precincts in a corridor can enable assessments of transport emissions as well as building emissions thus enabling better debates about 'well-located affordable housing' that is a major political agenda in Australian cities. The mechanism for doing this involves the GIS scenarios and how to integrate new elements into the model on green infrastructure SNAMUTS (public transport) and car dependence-related traffic reductions.

3. Preliminary Findings, Issues, and Difficulties

Several findings have already been outlined but some further observations are provided here for each pathway along with some issues and difficulties experienced.

Certification

The global grey literature review found that there was only the one stand-alone "net zero" certification for precincts, which was the Climate Active Carbon Neutral Standard for Precincts by the Australian Government.

There were several other sustainability certifications for precincts that contained a requirement or rewarded decarbonisation or net zero status of precincts but not a full net zero requirement as set out in the Paris Agreement and increasingly required by finance and government agencies.

The net zero certification space is moving rapidly as a result of the urgent need to decarbonise, the introduction of mandatory climate-related disclosures and landmark anti-greenwashing penalties being handed down in Australia. This informed the agenda for the Certification Forum, requiring the pathway to incorporate action-based research, including activities within the Certification Forum.

CER and Grid Integration

The research adopts a mixed methods approach including baseline interviews with a cross-section of representatives with an interest in CER which are well-advanced. The initial list of interviewees focused on the case studies and were structured around three core research questions:

- What are system design and performance challenges and opportunities for CER and grid integration at different scales of NZPs?
- How can we increase the uptake of CER in real-world project delivery and operation?
- What are the motivations or disincentives for CER and grid integration across different scales of NZPs?

As interviews have proceeded, it has been revealed that stakeholders additional to those directly involved in the case studies would be valuable in understanding the wider context of the CER and Grid Integration process. This was reinforced with feedback from the first IRG meeting, noting the need to consider broader economic and regulatory factors.

An emerging theme was the need to understand what motivates developers and investors to build NZPs and in the case of the Curtin Bentley campus, the complexities of moving to net zero in a precinct with existing and quite old infrastructure and buildings and the balancing act between net zero goals and fiscal responsibility.

A common theme expressed by precinct CER stakeholders is the time taken, and complexity, of getting approval for grid connections, and the conservative export limits that are imposed.

The relationship of land title to how residences and businesses connect to the grid, and/or the embedded network, and across public land needs to be investigated, as land title types are directly impacting the development of CER and grid integration, suggesting a potential focus for an upcoming paper. This topic is expected to align with the Governance Practices pathway.

Early pilot-scale modelling from the Digital Twin of individual buildings at Curtin indicates promising reductions in emissions and costs through the application of CER technologies.

Governance Practices

Preliminary results emerging from the online governance survey of stakeholders from all case studies indicate the following: there is an urgent need to improve governance processes; stakeholders do not have easy access to the information they need to participate in governance (and management) of their precincts; implementation of net zero activities and measures could be improved; and land titles are either "moderately effective" or "not effective at all" in supporting governance of their NZPs. While the online survey is still open for participation, these first findings are indicative of research, practice, and implementation needs to elevate governance matters in net zero precincts, so they become a foundational element rather than an afterthought. Answers to our survey questions will be further analysed and will form the basis of a paper to be completed in early 2025. Insights from the survey will be vital for the design and roll-out of the interviews and deliberative workshops to be held in 2025.

In 2025 and 2026, as indicated by the first results from the survey, suggest that we must find ways of improving the establishment and operations of governance in greenfield developments like Alkimos, in which there is little community to "engage" with or

co-shape governance processes in the first instance, in contrast to WGV where a community is already established.

There appear to be three key phases that may require different governance approaches in greenfield NZP developments:

- The planning and design phases, which can take even longer than elsewhere, and involve stakeholders from government and industry as well as nearby community members;
- A comparatively rapid phase of expansion, when people and businesses buy, build, and move into a precinct;
- A "steady state" where the community's size and complexity are relatively stable, even if some people move out while others move in, and many government and development stakeholders who were central to governance in the early phases of development, step back.

Urban Design

The first results of the modelling work show that the ET model can work using Australian data. The residual land value has been calculated along with a range of sustainability metrics and it is suggesting that a sustainability benefit is clearly defined in the WGV data. The results from this valuation model are now undergoing stress testing with existing industry standards and industry experts and peer review.

The technical challenges of data analysis and integration for ET-Oz require a multi-scale approach, with analysis conducted at a neighbourhood or precinct level, as well as at the city and region levels. Balancing insights across scales without oversimplifying the data is challenging and requires sophisticated analytical frameworks. In addition to that, accessing high-quality, consistent data across different geographical regions can be difficult. Many datasets in the original US ET model are incomplete, outdated, or incompatible, which impacts the accuracy of spatial analyses and predictive models. Integrating spatial data from various sources, including GIS, property records, and environmental data, requires systems that can interpret and combine different formats. This lack of standardization complicates analysis and increases the risk of errors.

These issues are being addressed and the Proof of Concept Report show the work done to resolve them. The Box on Pages 16 and 17 show very strong results that net zero attributes in precinct developments are likely to increase land value substantially. This is a globally significant result. Plans for the next phase of work are all now clearly building on answers to these issues.

4. Knowledge-sharing Impact

Knowledge sharing in this project is highly oriented to policy and practice-related exchanges between the researchers and the people involved in delivering net zero precincts. Thus knowledge sharing is part of research and occurs at both a 'pathway level' through PSG and IRG engagement, academic publications and other community of practice activities, as well as at 'project level' through the production of high-impact external-facing communications collateral, as outlined below.

A key project level activity in the first year was case study site visits and briefings by industry partners. This included a full day field trip to four WA case study sites, a Curtin Exchange Precinct site visit, and an Alkimos Central briefing. (See WA Case Study Site Visits Map, page 24)

Work is also underway on 'Impact Pathway Mapping' to help guide efforts towards system-wide change.

Certification

Many of the IRG members have been involved in the research that has gone into the literature and in particular the questions that are defining the NZP Certification Forum Paper. The paper is provided in Appendix 1 and is available on the NZP website.

The Certification Forum (the Forum) was held on 28 November 2024 as a fully online event where attendees gained insights into the latest industry developments and research. They were able to collaborate with the researchers to co-design future solutions to the challenges of certification based on five questions that have been developed as the basis of the research issues that have emerged so far.

Attendees at the Forum were asked to complete a survey ahead of the Forum which will now be used as a primary data source for the Certification Pathway along with the NZP Project more broadly.

The panel discussions at the Forum also provided a source of primary data for use by the Certification Pathway and the NZP Project.

In March 2025 a paper will be provided to attendees and published on the NZP website that will encompass the results of the research activities outlined above. At least one academic paper will be generated from this event. The Forum was recorded and was made accessible for viewing post event on the project website.

CER and Grid Integration

Stakeholder interviews are an important way for knowledge sharing to be very targeted. All interview participants have been given the key information about the NZP initiative and the specific focus of the CER and Grid Integration pathway before each interview according to ethics guidelines. These conversations have started with identified stakeholders for case studies to gain insights into our refined research questions, which are: the system design and performance challenges and opportunities for CER and grid integration at different scales of NZPs; how to increase the uptake of CER in real-world project delivery and operation, and what are the motivations or disincentives for CER and grid integration across different scales of NZPs. Further, we also ask each interviewee to recommend other potential research participants with relevant knowledge. Together with a comprehensive literature review this is intended to establish a baseline of knowledge as the sharing process goes in both directions.

The IRG is also a targeted group for knowledge sharing and has been formed with membership from Western Power, Powertech, AEMC, Elexsys, and the Superpower Institute. The first meeting has been held bringing IRG members up to date on research objectives, progress and plans, with detailed and productive feedback and guidance provided on the role of the IRG, our research directions, and in broadening our focus to include consumer needs, government and regulators. Key points raised by the IRG after we shared our research agenda and plans, and which we will consider are:

- Broadening stakeholder engagement to consumers, government and regulators and non-traditional CER/DER owners.
- The need to build resilience into power systems, beyond redundancy.
- The need to look at worst-case scenarios and what can go wrong.
- Can something that is technically possible scale be replicated in practice.
- The role of education in mitigating consumer "grid defection".
- What is the effect of interconnected precincts at scale, and how do we govern them?
- The need for a guiding hand for optimal economic and environmental outcomes.
- Interplay of investors (super funds, venture), property owners and tenants.
- Confusing and "cloudy" financial models that make it hard to understand the case for CER/DER.
- Developers don't plan the CER and DER for the property and need to be engaged.
- What are alternatives to embedded networks as some states are thinking of banning embedded networks due to rorting.

WA Case Study Site Visits Map

6 **ALKIMOS CENTRAL**

Lead Industry Partner
DevelopmentWA

DevelopmentWA hosted a presentation on Alkimos Central sustainability strategies

5 **RIVERMARK**

Lead Industry Partner
Hesperia

2 **KNUTSFORD URBAN REGENERATION PROJECT**

Lead Industry Partner
DevelopmentWA

4 **ROE HIGHWAY LOGISTICS PARK**

Lead Industry Partner
Hesperia

1 **CURTIN EXCHANGE**

Lead Industry Partner
Curtin University

3 **PEEL BUSINESS PARK**

Lead Industry Partner
DevelopmentWA

In June 2025 the CER and Grid Integration Forum will be held which will be a significant opportunity to share knowledge with participants who will also be able to collaborate with researchers in co-developing CER and grid integration approaches. This event will build on what has been learned from the Certification Forum.

PhD candidate, Ben James, has been moved from RACE for EVs to RACE for Change as he is working on a topic directly relevant to CER and Grid Integration, around Renewable Energy Hosting Capacity. He is being supervised by Professor Peter Newman and Dr Dean Economou and was granted a Western Power internship.

Professor Peter Newman provided an insightful view of the turbulent energy transition environment in the paper "Net Zero in the Maelstrom: Professional Practice for Net Zero in a Time of Turbulent Change" Sustainability 15, no. 6: 4810. https://doi.org/10.3390/su15064810.

Governance Practices

Knowledge sharing is central to the logic of Governance Pathway research engagements via the online survey and subsequent interviews, as well as the team's engagements with members from the IRG. These are knowledge-sharing activities in themselves as the mode of interaction is designed to be open and inclusive rather than extractive. For instance, insights gained from early IRG conversations informed the questions on legislative and regulatory aspects of net zero governance efforts in the online survey.

What required more effort, across the entire project, and arguably also a coordinated approach, is to tap into the diverse sets of expertise across the IRG group, via joint knowledge-sharing sessions that, as we know, are of interest to the IRG members. Given that the Governance Practices pathway is not scheduled to have a stakeholder forum until 2026, other avenues of collaborative engagements are needed, to be co-designed and delivered.

Responses to the Governance Pathway survey suggest interesting avenues for knowledge sharing. For instance, participants from the WGV residential precinct currently have no/very limited access to knowledge they need to successfully participate in precinct governance, including decisions about community energy resources. The team are currently evaluating whether we can provide information to fill the knowledge and skills gaps that survey respondents have identified, particularly in preparation for engagements in 2025 and 2026. The information materials would be simple, concise, and presented in plain language.

Upcoming research in 2025 and early 2026 (see Section 6), involving interviews and deliberative group activities, will provide ample opportunities for more creative knowledge sharing and joint learning. The latter, in particular, are inherently knowledge-sharing since they involve informed deliberation, in which participants are provided with sufficient high-quality information to deliberate and come up with a shared understanding of key issues. Deliberative, collaborative workshops themselves are designed to yield new knowledge and understandings that did not exist previously, and this knowledge will be shared with participants and other stakeholders, as well as through academic papers.

Urban Design

Knowledge sharing has been built into the research-based around the PhDs who are not just developing the ET-Oz model from the US ET model but are in close discussion with local planners, data agencies, and local communities that are all stakeholders in the project.

Knowledge sharing has been focused on two things:

- Understanding the model through discussion with the US partners and the ET-Oz team.
- Providing opportunities for knowledge sharing about the ET-Oz model and the potential to assist with urban design through public presentations in 2024 (Property Council, PIA State Conference, ERICA, Mobility Live) and community activities (Electrify Australia workshops). The publications below form the basis of these presentations.

Communications with industry partners such as Hawaiian, as well Curtin University valuation expert Andrea Constable, are ongoing to ensure the model to appraise the building typologies is in accordance with the International Valuation Standards. Discussions with other industry experts have indicated several relevant issues based on industry practice, such as fiscal impact, broad overview of metrics and debt financing. These insights are important as a reflective point to address the feasibility of net zero precincts and the value capture methodology. Without this early input from industry professionals, the model would not achieve practical standards.

The publications are of two kinds so far. First there are a series of reports that set out details on the modelling stages and how data was fitted into the model. The second knowledge sharing is academic papers where two have been published in the C40 Journal of City Climate Policy and Economy which requires practice-oriented outcomes for urban policy makers and practitioners. Five other papers are planned and a book. Professor Peter Newman published two papers in 2024 that helped explain why net zero corridors and precincts needed to be linked in professional practice. They were published in the C40 Journal of City Climate Policy and Economy, Policy Guidelines, Volume 2 (2): 221-240. https://doi.org/10.3138/jccpe-2023-0010 and Volume 2 (2): 241-250. https://doi.org/10.3138/jccpe-2023-0005.

Project-level Communications Activities

In distilling, communicating and sharing research outcomes through engaging content, the project will aim to amplify the impact and reach of research activities and, ultimately, further accelerate the adoption and scaling of net zero practices in precincts.

Communication activities in the first year of the project focused on developing strong branding, building the website, capturing high-quality images and video footage of confirmed case study sites, and beginning the production of videos in the web series. The full Communications Plan for the project and metrics and analytics for the first year of communications activities can be found in Appendix 2.

Branding was developed for the project to facilitate a cohesive project identity and voice across the diverse research partners, projects and case studies. A suite of design assets, templates and a style guide have been created and made available for project partners to utilise.

The project website netzeroprecincts.au was designed, built and launched. The website operates as the central repository for the project where resources and academic outputs will be housed and shared. Since its launch in May this year, 1,200 different people have visited and interacted with the site. This is expected to increase significantly in Year 2 as new content is added, and project momentum builds. Within the website, a sign-up form has also allowed us to build a mailing list of interested parties and we have used mail chimp to send targeted emails to this cohort about significant project milestones or activities.

VAM Media were engaged to develop a Production Plan for the full suite of the videos that will form the web series across the life of the project. Episode 1 'Series Introduction' was launched at the ERICA State of Energy Research Conference, held at Curtin University in early 2024. This Episode and its shorter Teaser video are hosted on the website, housed on the NZP YouTube channel, and shared on social media. Episode 1 has been viewed 269 times and the Teaser video has had 241 views to date. Our more recent video activity has been focused on producing our first case study vignettes. Case study vignettes for Knutsford Urban Regeneration Precinct and Peel Business Park are currently in production, due for release in early 2025.

Traditional media releases and pitches were created for the launch of the NZP project in October 2023 and in the lead-up to the Certification Forum to be held in November 2024. Media publications for the project have included the Serious climate reporting means serious climate business article by Professor Peter Newman and Angelina Bowden-Jones, published in the Fifth Estate. With the first round of journal articles from the team's researchers imminent, it is expected that media publications such as this will form a strong part of second-year communication activities.

Throughout the first year of the project, Curtin University Faculty of Humanities social media platforms have been leveraged to share project activities. PSG and IRG members have also been encouraged to share content from these sources. LinkedIn has been identified as the most impactful platform for this project and for reaching our target audiences. Video content has been by far our most impactful content. The project's reach on social media is significantly boosted by other key partner posts, including RACE and project team members with larger social media profiles. Social media activity will be increased in Year 2 as new research outputs are generated.

NZP's first dedicated open industry event was the Net Zero Certification Forum for Urban Precincts in November 2024 for which a Communications Plan was developed and executed to ensure the successful promotion of the event across industry, government, and academia.

The NZP project and researchers have also been featured at the All Energy Conference in Melbourne (October 2023), ERICA State of Energy Research Conference in Perth (February 2024), The Property Council of Australia's Future Cities Summit in Sydney and the National Planning Institute of Australia Conference. All of the presentations show-cased the NZP project. In June 2024 three of the project's PhD candidates presented at the RACE PhD onsite event in Sydney.

Preparations are underway for the onboarding of several new research partners into the project. Working closely with RACE, the RACE NZP Publication and Media Guidelines document has been developed, establishing a set of communications protocols. These include required materials and collaboration points for building the project website and video content, sign-off processes, and access to and guidance on branding and templates.

Looking ahead to Year 2 of the project, communications activities will focus on:

- Onboarding new research partners, including sharing key assets and templates to support the smooth integration of case studies into the project and its outward-facing communications. New case study pages will be created on the website and new researchers added to the team profiles. Work will also begin with new partners to develop their case study vignette videos.

- Video episodes and case study vignettes will continue to be rolled out over the course of 2024, with the aim of completing another two episodes and four vignettes over the next 12 months.

- Increasing our social media content and developing a more focused social media strategy to raise the profile of the project, particularly as it enters its second and third years, where more outputs are expected.

5. Case Study Research Direction

Case Studies, Synthesis Pathways and National Project

The next research phase will build on the work outlined in establishing each pathway, but two key ideas will be driving the next phase: first will be to ensure we understand what the pathways mean for each case study; and second, how we can begin to synthesise the pathway activities into a set of professional practice outputs that demonstrate how to transition to net zero precincts and corridors. This will be done for the whole national project, on each of the new case studies and case study activities like the Digital Twin at Sunshine.

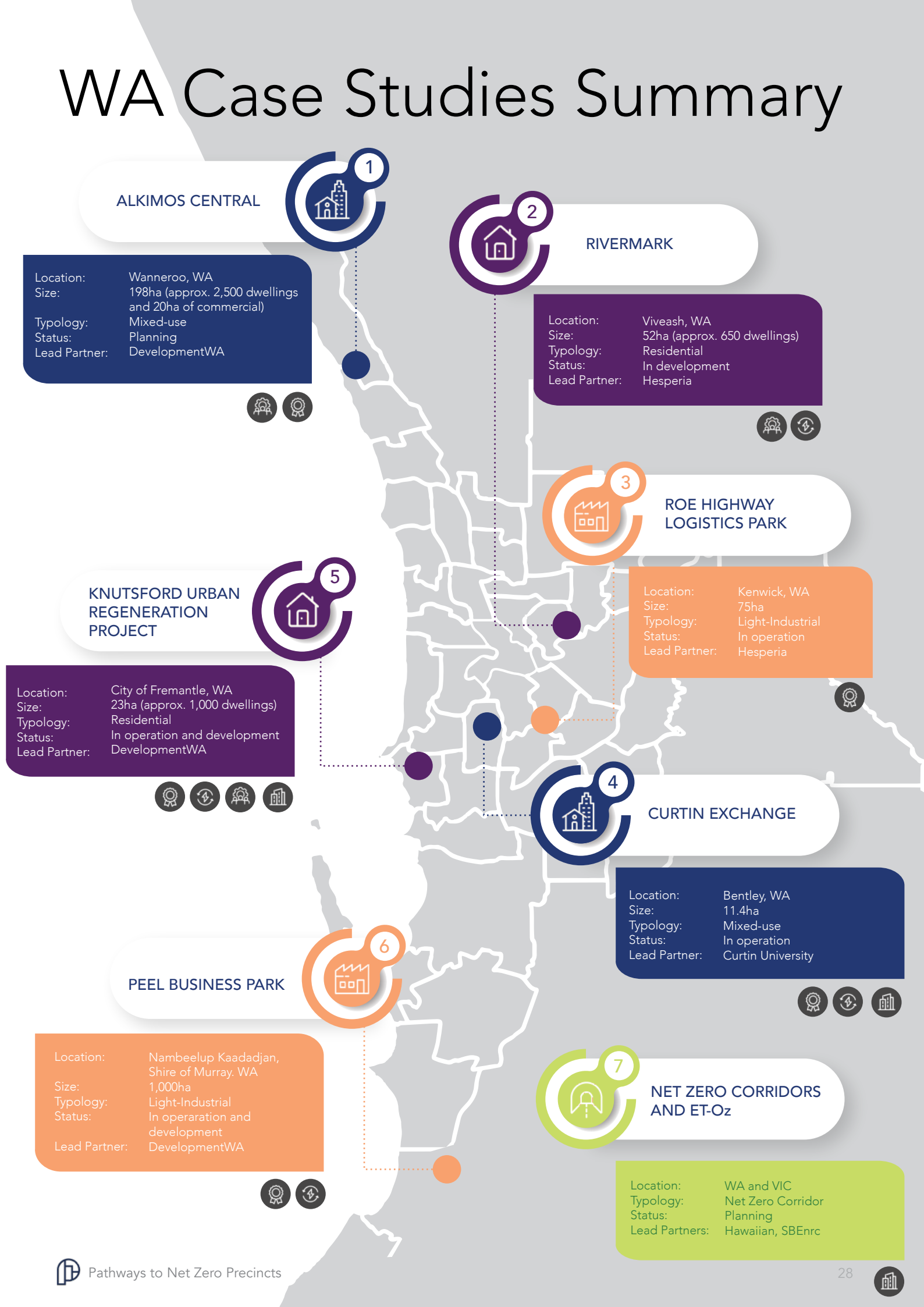
Each of the case studies in this research project can provide a unique perspective on the opportunities and challenges to achieve this outcome. The narratives outlined below are where the team have reached after one year of investigation in the establishment phase and then are taken further into the next phase of research.

Considerable work remains to achieve the kind of research outcomes that can lead to results and answers necessary to assist the partners in this project or be suitable for academic publication. However, a range of emerging questions and initial research findings are beginning to take shape which can now be formulated.

Each case study is set out showing a brief background, then a summary is given of the work done, followed by the emerging questions around each pathway and how they are integrating to enable some solutions to the questions.

Some research will cut across all WA case studies. For instance, the Governance Practices pathway will interview stakeholders in late 2024 and early 2025. Insights from these interviewees will provide the basis for deliberative workshops, also anticipated for all WA case studies, or, if more opportune, only for a select number where interest and needs are most pronounced.

WA Case Studies Summary



1 ALKIMOS CENTRAL

Location:	Wanneroo, WA
Size:	198ha (approx. 2,500 dwellings and 20ha of commercial)
Typology:	Mixed-use
Status:	Planning
Lead Partner:	DevelopmentWA

2 RIVERMARK

Location:	Viveash, WA
Size:	52ha (approx. 650 dwellings)
Typology:	Residential
Status:	In development
Lead Partner:	Hesperia

3 ROE HIGHWAY LOGISTICS PARK

Location:	Kenwick, WA
Size:	75ha
Typology:	Light-Industrial
Status:	In operation
Lead Partner:	Hesperia

4 CURTIN EXCHANGE

Location:	Bentley, WA
Size:	11.4ha
Typology:	Mixed-use
Status:	In operation
Lead Partner:	Curtin University

5 KNUTSFORD URBAN REGENERATION PROJECT

Location:	City of Fremantle, WA
Size:	23ha (approx. 1,000 dwellings)
Typology:	Residential
Status:	In operation and development
Lead Partner:	DevelopmentWA

6 PEEL BUSINESS PARK

Location:	Nambeelup Kaadadjan, Shire of Murray. WA
Size:	1,000ha
Typology:	Light-Industrial
Status:	In operaration and development
Lead Partner:	DevelopmentWA

7 NET ZERO CORRIDORS AND ET-Oz

Location:	WA and VIC
Typology:	Net Zero Corridor
Status:	Planning
Lead Partners:	Hawaiian, SBEnrc

Knutsford Urban Regeneration Precinct

Lead Industry Partner
DevelopmentWA

(Incorporating WGV, East Village and the Swanbourne Street Structure Plan Area)

This case study, which involves three adjacent DevelopmentWA residential sub-precincts (WGV, East Village and the Swanbourne Street Structure Plan Area), has had the most work attention and has been split into three parts as they each have a major and specific role to play. The CER and Grid Integration team has interviewed, or scheduled, baseline interviews with the key Development WA stakeholders for each of these precincts, and the results of those interviews will inform our understanding of key questions and potential interventions. Further, available data is being requested from each case study precinct for later quantitative analysis.

Work Done

WGV

The ET-Oz team has been applying the ET model to the WGV site in order to show how the US model can be applied to an Australian precinct in terms of data and key results. Several workshops have been held with the US partners, research staff and PhDs. The results indicate that ET-Oz can work on our precincts and now needs to be tried on a larger precinct that uses the WGV findings from the three building prototypes. Knutsford will now be used to see how the Swanbourne Street Structure Plan Area could use a range of scenarios before working on the next phase of how the ET-OZ model can be added several new functions using SNAMUTS, VMT, and UHI models.

WGV has also had preliminary work done by the Governance Practices team on how it can begin to be understood differently on its net zero journey. PhD researcher Annolies Truman, who is focussing on WGV, shows how the shared batteries from the Evermore Apartments (a part of WGV) have failed and what would be needed to enable better management. A broader survey is underway that will enable better understanding of what has worked and what has not worked in terms of governance in WGV and the other Western Australian case studies. Stakeholder interviews in WGV are planned for late 2024 and early 2025, to be undertaken by Annolies Truman.

East Village

East Village will become a significant part of the research as construction has reached a stage where the 670kWh shared battery that was set up on the site to service 36 future town-homes (still under construction) could be utilised by the new Montreal Commons apartment building (now complete). This may require a virtual power plant arrangement, or other innovative solution, as these sites are on different titles. The goal is to see how a better governance and management system can enable learnings from the Evermore site and create a model CER and Grid Integration system. Significant pathway synthesis opportunities appear to be growing here.

Swanbourne Street Structure Plan Area

DevelopmentWA are responsible for the delivery of the two major land parcels in the Swanbourne Street Structure Plan Area (Commonwealth site and PEET sites) which are well suited to scenario work with ET-Oz. Data for the site and a GIS system are underway so it can be workshopped with the US partners and the local partners. Knutsford will now be used to see how the Structure Plan could use a range of scenarios before working on the next phase of how the ET-OZ model can be added several new functions using SNAMUTS, VMT, and UHI models. The GIS-based scenario work should be completed in December.
The greater Knutsford Urban Regeneration Precinct is also a case study for the net zero corridors work and some early analysis has been happening with Jan Scheurer from RMIT using his SNAMUTS model to see what the options are for linking a modern transit option through to Knutsford to support net zero outcomes.

Emerging Questions

WGV

WGV is fundamentally a real estate concept but if it is to be a model for a net zero precinct it will need to resolve a range of issues, all of which are part of the NZP agenda. These issues cut across all our pathways:

- It is not working as a precinct but has a series of separate developments that are not connected by any precinct governance; within their separate parts, they may not be doing as much for the net zero agenda as first considered due to the lack of governance that enables sharing of net zero technologies.
- Its separate parts have a range of ways to share solar and batteries and even EV charging, but they are not using any sharing software that integrates these technologies into the grid or among each other.
- The original urban design and certification (One Planet Living) remain useful but with added innovations on the ground, WGV would become more of a model for how net zero could be used in other developments like the new development sites in the Swanbourne Street Structure Plan Area.
- One thing that works well is its public spaces and how the community use them and help with their upkeep; perhaps this suggests more of a governance model for new net zero opportunities.

Each Pathway in NZP could help provide options for innovation that can overlap in their ability to create better net zero outcomes.

NZP could help resolve some key questions:

- Is it time to reconsider how each of the separate building prototypes of WGV can upgrade to new software that enables local sharing and more beneficial grid integration? Can this be made useful for not just each of the four parts but for the whole precinct?
- There is a lack of governance for each of the four groups to enable this integration and sharing of solar. Is it time to create a better model for sharing solar in strata, social housing, Gen-Y housing, and green title private houses, all of which share the benefits of the public spaces?
- Is there a governance model for how the whole of WGV can be a model for net zero precincts? Can it be developed as a basis for the planning of new development sites in the Swanbourne Street Structure Plan Area? Can East Village innovations help?
- Can such governance enable a revamped certification to show how it all works?
- Can the concept be used to create Federal and State funds for what is needed to keep WGV at the forefront of net zero precinct innovation and demonstration?

Insights into appropriate interventions will be developed after the CER and Grid Integration baseline interviews have been conducted with the case study key stakeholder(s).
Central to this activity will be the need to engage with all the key people involved in the different parts of WGV and see how they view the opportunity for a different scale of governance to achieve broader sustainability goals than just their separate buildings.

East Village

The same issues concerning certification across the whole precinct also apply to East Village and are perhaps more cogent as the shared battery may be useful for the whole site if a shared mechanism for the system and a suitable governance system can be created. Insights into appropriate interventions will be developed along with the CER and Grid Integration baseline interviews once they have been conducted with the case study key stakeholder(s).

A further involvement of PhD researcher Issana Burhan in the East Village to analyse the green infrastructure data and relate it to her urban metabolism case studies and database, is also being pursued.

Swanbourne Street Structure Plan Area

What are the preferred options for the future if it is to be a model for the net zero future? Can it incorporate the best features of materials, construction, landscaping, and design that enable a financially successful set of outcomes? Can it be part of a model public transport linkage to Fremantle? Can all this be answered using the ET-Oz model? Can Certification be assisted by all this work?

Insights into appropriate interventions will be developed after the CER and Grid Integration baseline interviews have been conducted with the case study key stakeholder(s) for each of these three adjacent residential districts.

Investigation of system performance and repeatability for the shared solar and battery configurations will be undertaken (including end-use case analysis), along with the impact of integrated water supplies on power use.

This work will be a focus for PhD researcher Zhi Xuan Wang and a Masters student along with Faz Ikram, assisted by Dr Ivana Ivanova and working closely with Adjunct Associate Professor Dusan Mills.

Rivermark

Lead Industry Partner
Hesperia

Overview

The Rivermark residential development, located on a former brickworks site near Guildford, is targeting net-zero status and promotes regenerative urban development. Key initiatives include house design guidelines supporting energy efficiency and the inclusion of PV systems, the use of low-carbon materials in civil and landscape works and ecological placemaking.

Research Activities

Research activities at Rivermark will focus on investigating resident interest and uptake of a novel developer-led behind the meter battery leasing service to enhance the utilisation of locally generated solar energy. Technical performance through smart metering, as well as the importance of resident energy literacy and stakeholder trust will be investigated.

Work Done

Hesperia, the development manager for Rivermark, has trialed approaches to supporting behind the meter solar and storage system installation by residents and continues to seek effective incentive mechanisms. Purchasers will be surveyed to better understand their understanding and interest in such systems. Key stakeholders for Rivermark have been interviewed as part of the CER and Grid Integration baseline research. Other related stakeholder interviews have been scheduled.

Emerging Questions

The key questions and insights will emerge from the survey about how the solar-battery system works, the level of uptake and other adoption issues and technical matters to generate insights into system performance and repeatability.

Curtin University Bentley Campus

Lead Industry Partner
Curtin University

Overview

The Curtin Bentley Campus provides the basis for several layers of research activity. The Digital Twin project with Curtin Properties, Facilities and Development (PFD) is piloting the use of the tool for informing building design and management decision to reduce operational emissions. As confidence grows, the intention is to expand the use of the modelling to sub-precinct and campus-scale levels.

The Curtin Exchange precinct is being examined to understand the carbon mitigation potential of green infrastructure and associated landscaping. This data collection drew Issana Burhan into RACE as a PhD Top Up.

A Curtin-Vic Park Corridor will now be the focus of work after the Knutsford exercise can show how the ET-Oz model can provide answers to scenario questions. This will assist development questions that are currently on the table for the corridor and which Hawaiian are keen to work with the City of Victoria Park to resolve using the ET-Oz model in 2025.

As a precinct that is fully operational and has been in existence for some time, it is expected that the Curtin University campus will provide an opportunity to develop the certification assessment framework for application to existing urban precincts. Discussions are underway with Curtin PFD to align research activities with the university's decarbonisation plan.

Work Done

The Digital Twin has just begun and is already finding overlaps with the CER Integration process and Issana Burhan's landscaping data that is now feeding into calculations on carbon mitigation in landscapes.

The Net Zero Corridor work has had a SNAMUTS update showing new perspectives on the route for mid-tier public transport and potential development sites.

The CER and Grid Integration team has conducted a baseline interview with senior Curtin facilities staff on Curtin Exchange and the Bentley campus more broadly, providing detailed insight into how net zero goals and financial responsibility need to be balanced, and the challenges of net zero transitions on older buildings.

Emerging Questions

The questions will be developed as the research results are brought together in 2025. They will all be about the integration of digital twins with ET-Oz and the other pathways in NZP as well as issues to do with affordable housing densities along the corridor from Curtin Exchange to Victoria Park along Kent Street and into Perth CBD along the Albany Highway.

Insights into appropriate interventions will be developed after the CER and Grid Integration baseline interviews with the case study key stakeholder(s) have been evaluated.

Alkimos Central

Lead Industry Partner
DevelopmentWA

Overview

Alkimos Central is a DevelopmentWA masterplan project in the City of Wanneroo's northern coastal corridor, spanning 198 hectares and accommodating approximately 2,500 dwellings and extensive commercial and retail space. Key to its design is the transit-oriented Alkimos Train and Bus Station which forms part of the METRONET Yanchep Rail Extension.

With an aspiration to achieve net zero, the project team are using Lifecycle Assessment (LCA) to inform low carbon design decisions and investigating how best to integrate local solar energy generation and large-scale battery storage.

Research Activities

Research activities will explore the transferability of Distributed and Consumer-oriented Energy System (DES/CES) models across other development types with the aim of facilitating improved utilisation of locally generated and stored energy by multiple end-users under various land titles.

Work Done

In July the NZP team met with the Development WA team responsible for planning and developing Alkimos in a fruitful knowledge-sharing session.

A survey of key stakeholders on the Governance is being prepared and will be completed shortly.

The CER and Grid Integration team has scheduled baseline interviews with relevant Development WA stakeholders for this case study.

Emerging Questions

DevelopmentWA have undertaken a significant assessment process for determining the path forward for certification as net zero. It is expected that this case study will provide a very rich source of data to analyse the decision-making process that took place and the factors that were assessed by the developers in making their decision to proceed or not with net zero certification. A question has been posed by the DevelopmentWA staff is "Can the best solution for a new project like this be to pursue all the net zero opportunities and simply list them all without seeking Certification that so far does not consider all these factors?" This question will be explored by the Certification Pathway team.

Peel Business Park

Lead Industry Partner
DevelopmentWA

Overview

The Peel Business Park, located 70 km south of Perth in the Shire of Murray, is a forward-thinking agricultural, food, and industrial innovation hub.

A standout feature of the project is its privately owned and operated, grid-connected renewable energy microgrid. This system provides end users with a minimum of 50% renewable energy through on-site solar generation and battery storage, offering an expected 30% savings compared to regulated bundled tariffs. Positioned as a "green industrial park," the initiative aims to attract tenants with net zero ambitions and inspire similar projects globally.

As a DevelopmentWA site, the Peel Business Park is already demonstrating the potential of net zero industry through its shared solar-battery system. This precinct offers a unique opportunity to explore how microgrids and innovative roof space leasing models can contribute to certifying an urban precinct as net zero with integrity. Moreover, businesses within the park may benefit from the opportunity to explore the role of net zero certification in enhancing their sustainability efforts.

Research Activities

Research activities will focus on technical and governance considerations enabling this type of third-party owned infrastructure, including a roof top leasing model that will see the expansion of the existing 1MW ground mounted PV array onto privately owned buildings.

Work Done

The site was examined as part of the field trip by all the research team. It has a number of features that will be explored and examined by surveys from the Governance Practices pathway, and interviews by CER and Grid Integration pathway.
The key Development WA stakeholders for Peel Business Park will be interviewed as part of the CER and Grid Integration baseline research.

Emerging Questions

The core questions will be developed from the surveys that are about the extent of the net zero outcomes in the daily operations of the businesses in the Business Park and how well they operate.
Insights into appropriate interventions will be developed after the CER and Grid Integration baseline interviews have been conducted with the case study key stakeholder(s). System performance and repeatability, and opportunities to translate technical and governance learnings into mixed-use developments will be explored.

ROE Highway Logistics Park

Lead Industry Partner
Hesperia

Overview

The Roe Highway Logistics Park, a Hesperia project, has been recognised for its innovative approach to achieving net zero and its commitment to sustainability, including nature-positive landscaping. The 75ha development in Kenwick is celebrated for its adaptable industrial zoning and leading sustainability efforts, offering premium commercial amenities and direct rail freight access. The carbon neutrality strategy focuses on minimising the carbon footprint through design, low-carbon materials, and maximising renewable energy efficiency, supported by grants from the Clean Energy Finance Corporation (CEFC). Throughout the precinct, energy-efficient practices reduce overall energy demand, while smart technologies enable tailored solar and battery solutions for tenants.

Research Activities

Research activities will focus on understanding the effectiveness of energy efficiency and renewable energy initiatives, low-carbon materials, and achieving carbon neutrality through recognized offsets

Work Done

The site was examined as part of the field trip by all the research team and is being surveyed by the CER and Grid Integration and the Governance Practices research teams. It has been a subject of the Certification team and was part of the Forum.
The key Hesperia stakeholders for Roe Logistics have been interviewed as part of the CER and Grid Integration baseline research, and with other relevant stakeholders to be interviewed in November.

Emerging Questions

The emerging questions will be developed in 2025 and explored in more detail through the CER/Governance surveys. They were initially examined during the Certification Forum held in November 2024. Insights into appropriate interventions will be developed after the CER and Grid Integration baseline interviews have been conducted with the case study key stakeholder(s).

One emerging question is whether a longer paper setting out all its outcomes such as nature positive features on black cockatoo habitat, could be written for Hesperia as so far, the Certification does not do justice to such issues.

Insights into appropriate interventions will be developed after the CER and Grid Integration baseline interviews have been conducted with the case study key stakeholder(s). We will also investigate system performance and repeatability.

Net Zero Corridors / ET-Oz

Lead Industry Partner
Hawaiian, SBEnrc

Overview

The concept of Net Zero Corridors moves from precinct-scale to city-scale transformation using mid-tier transit routes as enablers of high-quality urban regeneration. Many of the net zero features and place qualities can be addressed at a precinct level, whilst improved financial and fiscal outcomes, as well as city-wide accessibility are achieved through corridors.

Research Activities

Initial corridor case studies will include a route from Knutsford to Fremantle, which intersects with the Knutsford Urban Regeneration Precinct, and a route from Stirling to Curtin which intersects with the Curtin Bentley campus precinct. A third case study will be in Melbourne along the Caulfield to Rowville corridor connecting with Chadstone Shopping Centre and Monash University's Clayton Campus.

Central to this research is the adaption and testing of an open-source US scenario modelling tool called Envision Tomorrow. Dubbed 'ET Oz', the Australian version aims to support decision making processes for optimising urban regeneration and net zero outcomes.

Caulfield Rowville Link

The Caulfield Rowville Link (CRL) is a case study that was considered to be the best opportunity outside Perth to enable the SBEnrc contribution to the Net Zero Precincts/ET-Oz project for a Net Zero Corridor.

Work Done

Research has begun with Dr Jan Scheurer from RMIT on how to enable SNAMUTS and VMT Reductions to be added to the ET-Oz model and hence enable a strong extra element to be given to the understanding of the Net Zero Corridor. In the interim, a SNAMUTS analysis has been done to upgrade the Melbourne data and enable some perspective on the corridor to be developed. Similar data has been collected on two Perth corridors with Dr Scheurer.

Professor Peter Newman and Dr Dean Economou from the NZP team have been working with Dr Jan Scheurer and stakeholders for this project.

Emerging Questions

Next work on this project depends on the local model being tested first.

Rundle Mall

Rundle Mall in Adelaide is a newly started case study led by the University of South Australia. The research will draw on several Governance models to create a Socio-technical Multi Level Governance (STMLG) analysis of the different pathways to achieve adoption of net zero innovations. This will embed the Precinct Carbon Assessment (PCA) tool developed by the UniSA researchers to achieve Net zero in collaboration with other precinct work at Curtin. The questions raised by this new work will be developed as the project progresses with an emphasis on linkages to Governance and CER-Integration.

Sunshine precinct

Sunshine Precinct in Melbourne is another new case study, led by RMIT researchers who are working on a Digital Twin. It is seeking to optimise urban design and especially green infrastructure by looking at the climate change impacts in various scenarios. The overlap with the Curtin digital twin will be pursued in detail but it is likely that ET-Oz and CER-Integration will also be of value to start detailed discussions.

6. Project Management and Pathway Team Coordination

This section provides an overview of project management and pathway team coordination processes that have been put in place to effectively deliver the project, in-line with the agreed timeframes and approved budget.

Project Management Overview

Project management during Year 1 of the project has focused on staff and student recruitment (See Appendix 3), undertaking regular engagement with the Project Steering Group (PSG), establishing an Industry Reference Group (IRG), and research related administrative tasks.

All staff and PhD positions are filled which is a significant achievement given the strong employment market.

PSG meetings, including representatives from DevelopmentWA, Hesperia, Western Power, Hawaiian and SBEnrc have been held every four months to update partners and gather their input in alignment with progress reporting milestones. The kick-off meeting was held on 30 November 2023, followed by meetings on 12 March, 18 June, and 6 November 2024. Each 120-minute session included industry updates, presentations from NZP pathway teams, and discussions with the research team and PSG members.

On April 8th, 2024 the NZP research team and PSG members participated in a full-day field trip to WA case study sites, enriching project collaboration and discussions. PSG members provided technical materials beforehand to help prepare a Case Study Synopsis for the team. The Curtin Exchange Precinct site visit was scheduled to coincide with the June 18 PSG meeting. The NZP team was invited by DevelopmentWA on July 17 2024 to attend a meeting providing an overview of Alkimos Central, held at their office in Perth. This meeting was open to other PSG members, providing a valuable opportunity for all participants to be included in the session for an introduction to Alkimos Central.

Given the wide scope of the NZP project, separate IRGs have been established for each pathway purpose. Members include experts, stakeholders, and decision-makers relevant to each pathway who contribute to shaping project priorities, addressing pathway-specific challenges, and ensuring alignment with industry needs. The IRGs also facilitate knowledge exchange by providing feedback on research outputs, suggesting practical applications and identifying opportunities for broader impact.

The terms of reference established for each pathway's IRG encompass several key components: the purpose and objectives of each pathway, membership criteria, roles and responsibilities of participants, meeting frequency, confidentiality agreements, and review processes. These elements provide clarity and structure within the pathways, guiding members on their contributions and aligning them with the overall goals of the project.

Research activities have centred around the PhD candidates, all of whom have progressed through the Milestone 1 process, except for the recently appointed CER and Grid Integration PhD. A new PhD candidate in ET-Oz is also being recruited. Ben James has transferred from RACE for EVs to RACE for Change and also completed an internship with Western Power, aligning more closely with NZP. He has completed Milestone 2, and is developing several papers relevant to CER and Grid Integration pathway. Additionally, Issana Burhan was awarded a Top-Up scholarship by RACE 2030 for the Urban Design pathway. Her research aims to further explore the integration of Urban Metabolism (UM) and Green Infrastructure (GI) into net zero-carbon city practices by developing a standardised decarbonisation framework. This framework will support the development of the ET-Oz model and will be applied to assess the landscape performance of the Curtin Exchange Precinct, one of the primary case studies. The analysis will focus on energy flow and carbon mitigation (including sequestration) within the precinct. The ultimate goal is to foster collaboration among planning stakeholders in developing the UM and GI framework, promoting green infrastructure as a fundamental approach to achieving the net zero carbon city agenda.

Human research ethics approvals are in place across all four pathways for initial research activities, as are protocols for data collection and management. While literature reviews are nearing completion, primary data collection has commenced where access to data and participants is available. Access to individual-level data for each precinct is being coordinated, ensuring that data collection complies with precinct-specific permissions.

Work Plans have been developed for each pathway. These are dynamic, reflexive documents, designed to evolve as the research progresses, with the timing of key activities, milestones and deliverables captured in the project Gannt chart. Each work plan outlines milestones across the short, medium, and long term, specifying start and end dates, responsible personnel, and current status to track progress.

Pathway Coordination

This section details specific project coordination activities for each of the pathways, including staff and PhD student resourcing, the emerging research narrative, IRG engagement and early outcomes. The roles, responsibilities and processes for on-boarding new precincts will be managed by the NZP Project Management Team and it is likely to follow the detailed on-boarding set up with the Communications Team as set out in the Communications Appendix as Sign-Off Protocol and also in their Publications and Media Guidelines.

- Certification

People: The Technical Lead, Dr Hugh Finn, was appointed in October 2024 after an extended recruitment process, to replace Dr Alessandro Sanches Pereira who returned to Brazil for health reasons. Fortunately, the PhD candidate, Angelina Bowden-Jones, commenced in February 2024 so we were able to begin the research in time to enable the Certification Forum which was the first NZP Forum. The focus on the Certification Forum held on November 28 2024 led to strong involvement of this pathway's IRG who helped to create the Forum agenda and its potential follow-up publications. The PhD student has completed her M1. The Professorial Lead is Professor Peter Newman.

IRG Engagement: Net Zero Precinct Certification is being driven by industry and the whole thrust of the NZP research is on how it can enable industry and government to resolve their issues. Meetings with IRG members on specific issues have taken place, however, the focus of the Certification pathway has been on the Certification Forum, which was very big IRG-type meeting. The IRG will consider the findings of the Certification Forum as the ongoing process of engagement is formalised in early 2025.

- CER & Grid Integration

People: Technical Lead Dr Dean Economou joined in January 2024 with Professorial Lead, Professor Peta Ashworth. PhD student Aditi Varma commenced her program in October 2024, with Milestone 1 anticipated by April 2025. The technical lead, Dr Dean Economou initially spent time collating publicly available information on each case study for the overall project, developing work plan templates and assisting with data management plans which are used for all pathways. The Digital Twin project, led by Dr Himanshu Agrawal was added to this pathway in April 2024. PhD, Ben James has moved from RACE for EVs to RACE for Change to align with NZP.

IRG Engagement: The IRG has been formed. The first IRG meeting has been held with valuable feedback on refining research questions and suggestions for additional stakeholders to be engaged as part of the research.

- Governance Practices

People: Marg Gollagher was appointed as Technical Lead in April 2024. The Professorial Lead is Professor Petra Tschakert. The PhD Candidate, Annolies Truman, began in February 2024 and successfully completed her first milestone in September. Changes to the supervisory team has required careful navigation and has ramifications for the pathway team and its smooth and collaborative progression toward pathway deliverables.

IRG Engagement: The IRG is largely established, with eight people who have accepted and two more pending. One prospective additional member has been identified who has extensive experience in sustainability and low-carbon approaches, leading an industrial precinct in Western Australia, and aspects of governance. Professor Petra Tschakert and Marg Gollagher have had one-on-one conversations with some IRG members, revealing key issues, including skills shortages and the current development of a Code of Conduct for Strata which will cover the benefits of investment in renewables. The first online IRG meeting is planned for early 2025.

- Urban Design

People: Faz Ikram was appointed as PhD to develop the modelling with a focus on finance and fiscal analysis. Faz is a qualified accountant who has spent more than 15 years in investment banking and finance. He was appointed based on his experience in construction finance and corporate finance, which adds value to the research. A second PhD candidate, Zhi Xuan Wang from China, is expected to start officially in March 2025. He brings a wealth of GIS skills instrumental to the urban design pathway and will build on the work started by Mazdak Ghasemi Tootkaboni who was employed as a research assistant to enable the first stage of converting ET into ET-Oz through applying data from WGV to the US model and showing how the system could be adapted for the Australian data and systems of information. Zhi Xuan Wang will work on the GIS scenarios and how to integrate new elements into the model on green infrastructure, SNAMUTS (public transport) and car dependence-related traffic reductions. This additional work on the model will be assisted by Dr Jan Scheuer from RMIT (SNAMUTS).

Dusan Mills from Hawaiian (PSG representative) was appointed as an Adjunct Associate Professor at Curtin and meets weekly with the research team; he set up all the workshops with partners from the United States of America, which is Peter Calthorpe from Calthorpe and Associates, Scott Fregonese and Julia Raisemann from 3J Consulting, and Ian Carlton from Map Craft.

The research has received modelling guidance from Dr Shengping Li for Life Cycle Analysis and Dr Song Yong Tze for GIS from Construction Management, School of the Design and Built Environment, Curtin University, with special advice for integration of GIS modelling from Dr Ivana Ivanova, Senior Lecturer in Spatial Science at the School of Earth and Planetary Science, Curtin University.

For affordable housing, the urban design research component will receive modelling insights from Peter Calthorpe in the US, who is on the IRG. Additionally, local supervising Professors Mohamad Swapan and Reena Tiwari will be part of the next phase of scenario modelling.

The first PhD candidate (Finance), Faz Ikram passed Milestone 1 in August 2024.

IRG Engagement: To date, IRG engagement has primarily been with the US team with working experience on the ET model. This aligns with the early-stage focus on understanding how the model works and demonstrating proof of concept of ET-Oz. With this first critical step successfully completed, IRG engagement will now broaden out.

7. Conclusion

At the completion of Year 1, the project is in good standing with significant work completed: appointing the research team, establishing work processes, delivering high quality communication outputs and shaping the direction of the research with project partners and stakeholders.

The quality of the research has overall been very high as outlined in this report, with some pathways having a much quicker start due to the availability of Technical Leads and recruitment of PhD candidates. The ET-Oz part of the NZP project has been working through different stages of assessing how to apply the ET model to the Australian data and GIS processes. A series of Reports were produced as part of each workshop and PhD milestone in discussion with the US partners and the research team as a whole.

Governments at all levels are not yet ready for net zero in their regulatory and strategic frameworks as they need to know more about: how to certify; how to integrate its solar, batteries and electric vehicles into the grid; how to do governance of such systems in different types of precincts and different types of land titles; and how to integrate it into urban design plans that enable more affordable housing, more well-located housing near quality public transport, more green infrastructure, and less urban heat island effect, all whilst enabling it to be financially viable and provide good tax returns. This is our ambitious goal to provide such a set of solutions.

Appendices

Appendix 1: Certification Forum Paper

Appendix 2: Communication Plan

Appendix 3: Research Team Information

Appendix 1

Certification Forum Paper

Net Zero Certification for Urban Precincts

pathways to net zero precincts

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Curtin University

RACE for 2030

Summary

Net Zero is becoming the standard bearer for the next economy. This paper outlines:

1. Why net zero certification is happening,

2. How net zero precincts are becoming a focus for new urban development practices,

3. How historic certification practices have evolved to cope with net zero,

4. The diminishing role of offsets, and

5. Where net zero certification could evolve to address precinct-scale innovations that are accelerating change, even as many net zero technologies remain uncommercialized.

Central to this discussion is the recent mandatory climate-related disclosures and their requirement to report against net zero commitments and how professional practice can embrace these requirements, how transition scenarios can be integrated into net zero frameworks with integrity and the role of certification processes.

The Questions raised in each part of the paper are provided to be used in the virtual Forum on Net Zero Certification on 28 November 2024, to seek responses in a collaborative, co-design process. Readers are invited to begin responding to the questions which will be addressed by Speakers and are a focus for Panels.

About Pathways to Net Zero Precincts: Pathways to Net Zero Precincts is a three-year research project to develop and implement innovative strategies for transitioning urban precincts towards net zero emissions. A collaborative initiative between Curtin University, the RACE for 2030 Cooperative Research Centre and a consortium of leading industry and research partners, case studies from across Australia form the testing ground for real-world interventions.

https://netzeroprecincts.au/

Introduction

The Paris Agreement in 2016, signed by 197 nations, began to drive net zero targets, strategies and actions. In more recent years the number of organisations committing voluntarily to net zero emissions by 2050 has continued to rise [1], accompanied by the adoption of sustainability and net zero certifications.

Following COP26 in Glasgow, there has been a rapid increase in mandatory climate and sustainability related disclosure policies globally, coupled with an increase in anti-greenwashing policies. Mandatory climate-related disclosures will be required in Australia for large organisations from 1 January 2025, with a phased-in approach for other organisations over the following three years. While the mandatory disclosures initially apply to larger organisations, they will increasingly involve small businesses as part of the requirements for large organisations to report greenhouse gas (GHG) emissions across their value chains. Importantly, these mandatory climate-related disclosures will require organisations to report against their net zero commitments and plans to the extent such a commitment has been made. However, the impact of these disclosures on net zero certification is still unclear, especially in urban development.

Voluntary certification still has a role to play in the emerging environment of mandatory disclosures. Certification helps to reduce the risk of greenwashing as it communicates the net zero status of the underlying item being certified with trust. Urban developers, planning bodies and certification providers in Australia have been at the forefront of the net zero agenda. They will now need to rapidly transition from the historical voluntary certification environment to comply with mandatory disclosures. Some voluntary certifications in the built environment are likely to continue to play an important role in communicating the sustainability rating of a building or precinct, as well as meeting building standards where required.

A Certification Forum on 28 November 2024, run by Curtin University and RACE for 2030, will be an opportunity to explore the transition from voluntary certifications and commitments to the mandatory requirements facing built environment professionals in Australia. The Net Zero Precincts Project has four Pathways that are being researched on case studies across Australia: Certification, Community Energy Resources and Grid Integration, Governance Practices and Urban Design. After 12 months of research the Certification Pathway team has provided this paper as an overview of the status quo and possible trajectory. To help Australia reach net zero precincts by 2030 and beyond, the urban development sector needs to be prepared for the new mandatory disclosures era and the related policy requirements. Certification for net zero precincts will need to find practical solutions on-the-ground.

1 Climate Action 100+, "Climate Action 100+ Net Zero Company Benchmark 2.0 2023 Results," 2023.

Why Certify as Net Zero?

The deterioration in global climate has become a larger and larger driver of the need to change and deliver the Paris Agreement's net zero agenda. The world is witnessing record-breaking temperatures and increases in the severity and frequency of climate-related disasters. Net zero enables us to progress towards global cooling as soon as possible. Governments are seeing that climate-based disclosures and net zero certification are major tools that can be used to help the economy transition to achieve climate stability.

The major political driver of the Australian net zero agenda is that mandatory climate-related disclosure is now required from 2025 for large organisations, and this will flow down to smaller ones as each part of the value chain will be included. Organisations captured by these disclosures will be required to report against their net zero commitments and plans to the extent such a commitment has been made. Certification of the net zero status of an organisation or project should make it easier to comply with these disclosure requirements as the certification process often requires regular reporting against net zero targets and plans.

The associated economic driver for net zero certification is the shift by the world of finance towards net zero outcomes[2]. This is having consequences for business and government and is certainly impacting urban development.

For many organisations, the driver of net zero certification is social licence[3]. Net zero has been through a period where some organisations have sought to communicate net zero in their advertising but have not been doing it in a credible manner. In Australia this is being addressed by the Australian Competition and Consumer Commission (ACCC) and the Australian Securities and Investments Commission (ASIC). The ACCC released guidance for businesses in late 2023[4] in relation to environmental and sustainability claims for all businesses in Australia. False or misleading environmental claims by an organisation will contravene Australian Consumer Law and the ACCC considers that "a business will be engaging in greenwashing where it makes a claim that represents a product, service or the business itself as better for or less harmful to the environment than it really is"[5].

Over the past two months landmark penalties in relation to greenwashing cases brought by ASIC have been handed down by the Federal Court. In early August 2024 ASIC was successful in the Federal Court where Mercer Superannuation (Australia) Ltd agreed to pay a landmark $11.3m penalty for making misleading statements about the sustainability-based claims on the nature and characteristics of some of its superannuation investment options[6]. In late September 2024, Vanguard Investments Australia was ordered to pay a $12.9m penalty for making misleading claims about

2 Kreibiehl et al., "Investment and Finance," in Climate Change 2022: Mitigation of Climate Change, 2022
3 Andrè and Valenciano-Salazar, "Voluntary Carbon Neutral Programs," 381.; Birkenberg and Birner, "The World's First Carbon Neutral Coffee," 485.
4 Australian Competition and Consumer Commission, "Making Environmental Claims," 2023
5 Australian Competition and Consumer Commission, "Making Environmental Claims," 2023

environmental, social and governance exclusionary screens[7]. On 23 August 2024 ASIC released a report[8] on their surveillance activities over the 15 months ending 30 June 2024 in relation to greenwashing misconduct. They have recommended that even if the mandatory climate-related disclosures do not apply, organisations should consider those disclosure requirements if they are voluntarily disclosing climate-related metrics and targets. In addition, they have found that there is inconsistent and interchangeable use of terms such as carbon neutral, net zero emissions and zero emissions. The United Nation's preferred term is net zero as set in the Paris Agreement and they have now suggested how non-state actors can create net zero commitments with integrity[9].

Greenwashing risks can be minimised through the use of net zero certifications to demonstrate integrity of the net zero commitments of an organisation. Net zero commitments will demonstrate integrity where there is alignment of actions with commitments and plans that are based in credible science in accordance with a 1.5°C pathway, and where there is transparency of actions and plans that hold an organisation accountable[10]. The rapid reduction in GHG emissions that is needed will grow as organisations show they wish to embrace these principles of integrity.

Net zero certification is not straightforward, but it is increasingly necessary to communicate the climate goals of an organisation. There is a plethora of net zero certifications globally and trying to determine which one best suits the underlying goals and purpose of the organisation, or project, seeking to be net zero takes time, knowledge and money. This is a barrier for many businesses. However, standardisation of net zero disclosures due to the mandatory climate-related disclosures, will hopefully make net zero certification more user-friendly.

Question 1: Are there any reasons why net zero certification in relation to the built environment will not grow? Please outline.

6 Australian Securities & Investments Commission, "ASIC's First Greenwashing Case Results in Landmark $11.3 Million Penalty for Mercer," Media Release, August 2, 2024.
7 Australian Securities & Investments Commission, "ASIC's Vanguard Greenwashing Action Results in Record $12.9 Million Penalty," Media Release, September 25, 2024.
8 Australian Securities & Investments Commission, "ASIC's Interventions on Greenwashing Misconduct: 2023-2024," 2024.
9 United Nations, "Integrity Matters: Net Zero Commitments," 2022.
10 United Nations, "Integrity Matters: Net Zero Commitments," 2022.

Why the precinct scale?

The RACE for 2030 Cooperative Research Centre has partnered with a consortium of research and industry partners on the Pathways to Net Zero Precincts (NZP) Project. Led by Curtin University, the aim of the project is to explore the net zero transition for urban precincts through the development and implementation of innovative strategies[11]. The NZP Project contains four 'research pathways' as depicted in Figure 1 and includes a range of precinct case studies across Australia.

The precinct scale of urban development is "a unified area of urban land with a clearly defined geographic boundary, synonymous with a neighbourhood or district."[12] A typical precinct will contain private and public land with shared infrastructure[13] and consists of many different stakeholders, including residents, employees, visitors, along with the investors, developers and operators. It also consists of various building typologies and includes transportation and public spaces each of which, along with the stakeholders, are responsible for GHG emissions.

The rationale for focussing on precincts is that they provide a practical scale of urban development by which to decarbonise a city[14]. The new technologies of the net zero transition – solar, batteries, associated electrification of everything including vehicles –are found to be very effective if shared at the precinct scale[15] . The household scale, individual industry and business scale, and larger scale activity like whole sections of the power grid, are also proceeding to decarbonise, however, many

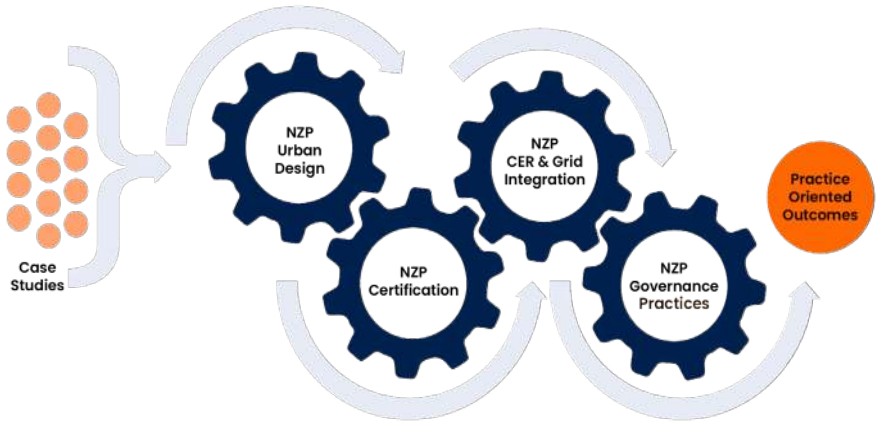


Figure 1 Pathways to Net Zero Precincts

11 RACE for 2030, "Pathways to Net Zero Precincts." 2023.
12 Thomson et al., "Guide to Low Carbon Precincts." 2018
13 Thomson et al., "Guide to Low Carbon Precincts." 2018
14 Loveday et al., "Identifying Knowledge and Process Gaps," 3057.

commentators and local governments see the precinct scale as being a major part of the next economy[16].

The precinct scale is also widely regarded as the most effective for regenerating urban areas[17], as it allows for easier replication across the broader city landscape and can integrate more of the new technology and infrastructure.

Question 2: Are there any new barriers to urban precincts becoming an increasing proportion of net zero certification? Please explain.

What role has certification played historically?

Australia's building sector is no stranger to sustainability certifications and a growing number of Australia's buildings have sustainability ratings. Globally, the commercial side of the building sector dominates sustainability certification in the built environment[18] which should put the sector in good shape for what is coming with mandatory climate-related disclosures.

Certification adds credibility and demonstrates that the underlying item being certified meets the expectations of stakeholders[19]. It is often voluntary in the context of sustainability-related certifications, however, energy-related certification has been required for a long time in the built environment in Australia. This could now incorporate net zero.

There are numerous benefits associated with sustainability certifications, including an improvement in the social license or "green image" of the organisation being certified[20], along with financial opportunities not available unless certified net zero, cost benefits such as energy efficiency, an increased willingness to pay by consumers for products that exhibit sustainability credentials[21] as well as a higher value of buildings for those with higher NABERS or Green Star ratings[22]. However, certification also comes with a cost associated with the certification and verification processes,

16 Thomson et al., "Guide to Low Carbon Precincts." 2018
17 Thomson et al., "Guide to Low Carbon Precincts." 2018
18 Warren-Myers, "Valuing Sustainability Part 2," 351.
19 ISO, "Certification," n.d.
20 Andrè and Valenciano-Salazar, "Voluntary Carbon Neutral Programs," 381.
21 Birkenberg and Birner, "The World's First Carbon Neutral Coffee," 485.
22 Lee et al., "The Role of Mandatory Building Efficiency Disclosure," 297.

along with the cost of offsets if required for the purposes of certification[23]. A lack of expertise, knowledge and resources to implement the certification process can all present as barriers to certification[24].

At the precinct-scale there are several sustainability certifications that exist globally as well as within Australia (see Appendix One for a summary of the certifications). These certifications are ordinarily undertaken on a ratings basis, that is a certain number of points are awarded for meeting the requirements of each category within the certification. Some reward energy efficiencies and the use of renewable energy, however, very few contain a requirement for net zero emissions. Of those that contain a requirement for net zero emissions one is Australian, being the Green Building Council of Australia (GBCA)'s Communities rating tool, of which an updated version is expected for release imminently. However, the current version does not require net zero emissions. Whether a broad or narrow sustainability certification is chosen will depend upon the sustainability goals of the precinct, proponent and stakeholders.

There is only one certification that exists globally to certify a precinct as net zero. This is the Australian Government's Climate Active Carbon Neutral Standard for Precincts. The standard only applies to precincts within Australia, and it refers to a state of carbon neutrality rather than net zero, which is achieved through the purchase of carbon offsets. There have been some concerns raised with the use of offsets to achieve the carbon neutrality status that is certified by this program, most recently as part of the Australian Government's Senate Inquiry into Greenwashing[25]. The Australian Government is currently undertaking a review of the Climate Active Program and an announcement on the direction of the program is expected later in 2024[26].

Question 3: Is it likely that urban development certification by simple ratings will become less or more important in an era of increased need for net zero? Why?

23 Andrè and Valenciano-Salazar, "Voluntary Carbon Neutral Programs," 381.; Birkenberg and Birner, "The World's First Carbon Neutral Coffee," 485.
24 Acampora et al., "Towards Carbon Neutrality in the Agri-Food Sector," 106755.; Andrè and Valenciano-Salazar, "Voluntary Carbon Neutral Programs," 381; Barbhuiya et al., "Decarbonising Cement and Concrete Production," 108861.
25 Parliament of Australia, "Public Hearings." 2024.
26 Department of Climate Change, Energy, the Environment and Water, "Climate Active Program Direction Consultation 2023." 2023

What about offsets?

Carbon offsets were one of the first actions encouraged by global climate processes and by the Australian Government. The overreliance on carbon offsets to achieve net zero GHG emissions is now seen as being fraught with danger. There have been numerous concerns raised as to the integrity and benefit of carbon offsets in the net zero transition. A study was released in early 2024 which analysed 182 projects under the Australian Carbon Credit Unit Scheme and found limited evidence of regeneration in credited areas[27]. If offsets do not represent genuine, additional and permanent abatement, then they can in fact contribute to increased emissions by allowing the very emissions they are intended to offset to continue[28].

The application to net zero precincts is likely to highlight the need to resolve the offsets issue. Consumers, and those stakeholders visiting urban precincts, are likely to want to know the products or services they purchase, the residences they acquire, and that their workplaces are genuinely delivering on their stated claims and commitments. However, there is concern with the growing number of voluntary net zero commitments and the lack of regulation on what net zero really means. What is being done might not live up to what is being communicated to consumers, for example, people buying or selling property are likely to be very keen to avoid accusations of net zero greenwashing. To mitigate these risks, anti-greenwashing policies are being introduced globally.

The issue of offsets is complicated by certifications requiring carbon neutrality or net zero through the use of offsets, such as the Climate Active Program. If everyone uses offsets to reach net zero rather than reducing their GHG emissions in the first instance, there simply will not be enough offsets available[29]. There is only a finite amount of land available for trees to be planted, oceans to capture the blue carbon and considerable progress is needed to scale carbon removal technologies to the level required.

Question 4: Is there a way of ensuring carbon offsets have integrity? Will it be necessary to find a mechanism for certification of built environment projects without carbon offsets? How?

27 Macintosh et al., "Australian Human-Induced Native Forest Regeneration," 149.
28 Macintosh et al., "Australian Human-Induced Native Forest Regeneration," 149.
29 University of Oxford, "Oxford Researchers Launch Updated Carbon Offsetting Principles," February 28, 2024.

What is the role of net zero certification in the future?

While carbon accounting has been standardised over the past 25 years commencing with the GHG Protocol's GHG accounting standards, there is no such similar standard for net zero GHG accounting. Net zero certifications have stepped into that void by providing methodologies within their certification frameworks on how to calculate those net zero states. While these are fragmented and contained within multiple standards and frameworks and administered by numerous certification bodies globally, there is nothing else that provides confirmation to consumers that something is net zero.

However, in recent years, the standardisation of sustainability reporting standards at the global level started with the announcement of the International Sustainability Standards Board (ISSB) at COP26 in 2021. In 2023 they released the first two standards, which includes IFRS S2 Climate-related Disclosures[30]. Australia has swiftly adopted this approach and has recently passed legislation mandating climate related disclosures that largely follow IFRS S2 within AASB S2 Climate-related disclosures[31]. AASB S2 will apply on a phased-in approach commencing with large organisations from 1 January 2025.

Australian organisations that are required to comply with AASB S2 will need to disclose any net zero commitments they have made, which includes a commitment made for a product or service, a building or precinct they own, or an organisation-wide commitment. The disclosure requirements include an explanation of how the net zero targets were determined, their plans to achieve the targets and which emissions they relate to, for example, Scope 1, 2 and 3 or just a subset of those. Regardless of what GHG emissions the net zero target relates to, or whether the organisation has made a net zero commitment, AASB S2 requires disclosure of Scope 1, Scope 2 and Scope 3 GHG emissions on an annual basis.

These mandatory climate-related disclosures only specify the types of information that must be reported. To commit to net zero, organisations and projects need to develop scenarios for net zero targets and create plans that can be justified in commercial and scientific ways in line with a 1.5°C pathway. In the transition to mandatory disclosures, there is going

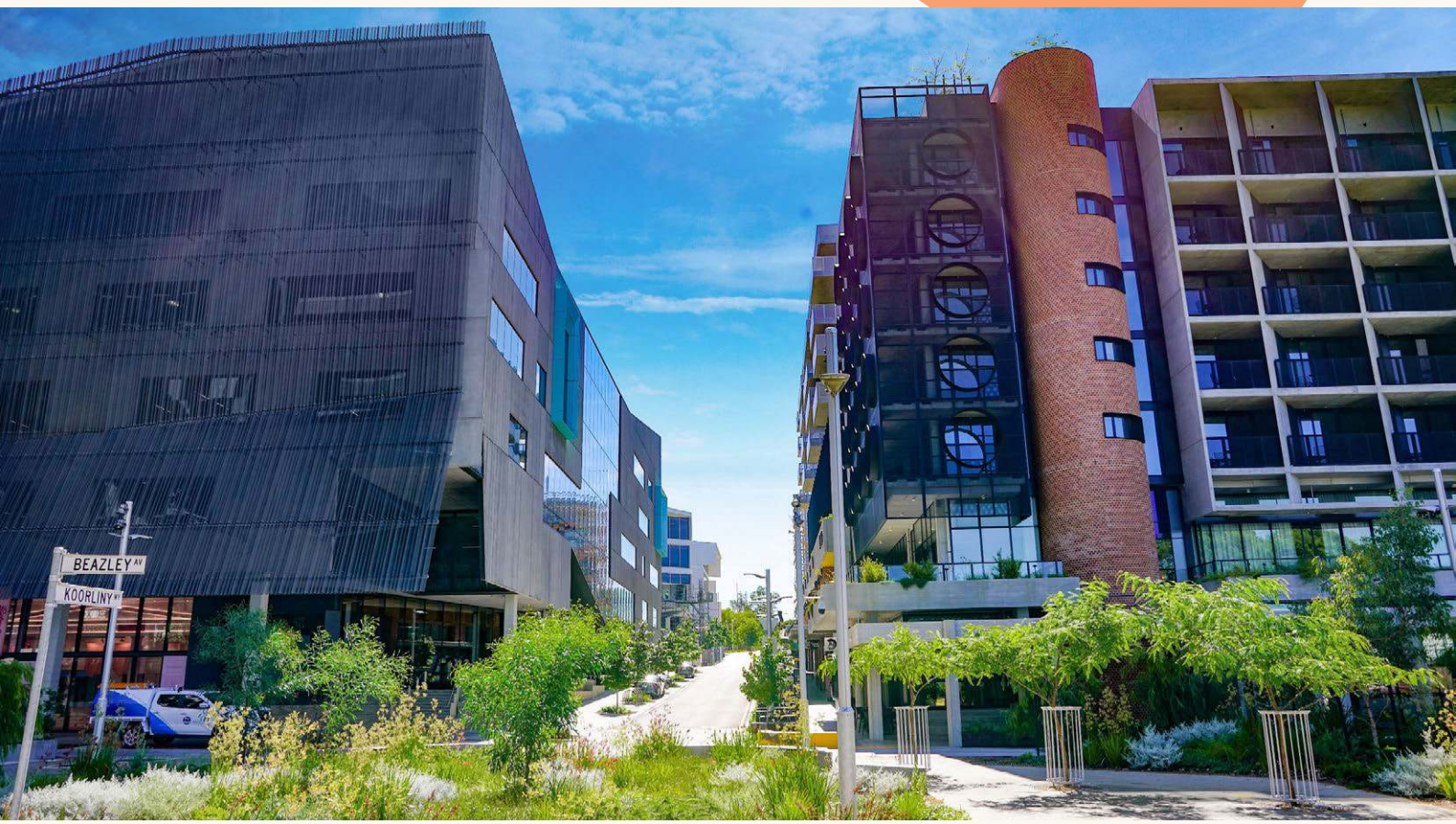
30 FRS, "IFRS S2 Climate-Related Disclosures," 2023.

31 Australian Accounting Standards Board, "Australian Sustainability Reporting Standards," 2023.

to be a need to address the commercial realities of this process. There are some technologies and processes that are easy and some that are hard as they are not yet commercial. These have become traditional approaches to the energy transition as used in strategies such as the McKinsey Waterfall Charts. Certification should be able to recognise that strategies can become more able to adopt net zero outcomes as they become commercially available. Otherwise, offsets will be the only way to achieve net zero and as shown above, these are simply not going to be available in enough quantities.

Transparent communication of the progress towards net zero targets and progress against net zero plans is required so that everyone can learn from each other, and we can move towards the "radical transparency" approach called for by the United Nations High-Level Expert Group in their 2022 Integrity Matters Report[32].

Question 5: What are the most helpful processes to ensure net zero precinct certification can be enabled into the future? Is a staged approach of transition to net zero precincts, without the need for offsets, plausible? If so, how?



32 United Nations, "Integrity Matters: Net Zero Commitments," 2022.

Conclusion

By the time of the Net Zero Precincts Certification Forum on 28 November 2024, there will be little more than a month before the commencement of the mandatory climate-related disclosures in Australia. Navigating a way through the multitude of terms used to describe net zero GHG emissions, choosing the right net zero pathway, compiling the net zero action plan and then communicating all of this to the market will require significant focus on enabling a good process. Organisations will still be left to navigate their way through the fragmented voluntary certification world should they wish a part or their whole organisation or projects to be certified as net zero.

There will be increasing pressure to develop net zero precincts but without proper processes for certification they could face anti-greenwashing litigation. Fear of falling foul of the anti-greenwashing guidelines will only prevent communication of net zero commitments and actions at a time when it is critical for a rapid reduction in GHG emissions to be taking place. Selecting the most appropriate certification needs to be in line with the most credible science to keep to the 1.5°C pathway, be transparent and ensure that actions are matching commitments. To understand the new processes and requirements of net zero that keep to these goals will need professionals to rapidly find practical ways to demonstrate solutions.

To aid in this process we invite attendees ahead of the coming Forum to consider the questions summarised on the next page. Speakers and attendees will be able to address these questions and others that are raised, as we all help to co-design the future of net zero certification.

Please see a link here to the information statement for the research project which we encourage you to read before providing your answers to these questions within an online survey here. The survey is part of a PhD project and will take approximately 15 minutes to complete. Curtin University Human Research Ethics Committee (HREC) has approved this study (HRE2024-0506).

Questions to consider ahead of attending the Certification Forum

1. Are there any reasons why net zero certification in relation to the built environment will not grow? Please outline.

2. Are there any new barriers to urban precincts becoming an increasing proportion of net zero certification? Please explain.

3. Is there a mechanism for certification that can enable non-offset actions with clear stages to full net zero? Why?

4. Is there a way of ensuring carbon offsets have integrity? Will it be necessary to find a mechanism for certification of built environment projects without carbon offsets? How?

5. What are the most helpful processes to ensure net zero precinct certification can be enabled into the future? Is a staged approach of transition to net zero precincts, without the need for offsets, plausible? If so, how?

Appendix One

Name of certification	Organisation	Coverage	Sustainability targets	Net zero measure	Scope 3 emissions	Embodied emissions	Frequency	Accountability & Transparency	Verification
Climate Active Carbon Neutral Standard for Precincts [33]	Climate Active (Australian Government)	Australia	No	Carbon neutral operational emissions through use of offsets	Yes – material, relevant, can influence	No	Annual	Annual Public Disclosure Statement	Independent verification required
BREEAM Communities [34]	BRE Global Limited	UK (can be modified for global application)	Yes	Scoring system Maximum points for 100% reduction in CO_2 emissions against baseline energy demand (carbon neutral), can use	Transport emissions are optional	No	In designing and planning stages only	N/A	Energy strategy written by an energy specialist Independent third-party auditor
DGNB System for Districts [35]	DGNB (German Sustainable Building Council)	Global	Yes	Carbon neutrality in accordance with "DGNB CO_2 balancing rules"	Bonus points for transport and logistics related emissions	Only for new buildings	3 phases Industrial sites recertified every 5 years Non-industrial is unlimited	N/A	DGNB auditor
One Planet Living Leader [36]	Bioregional (endorsement, not a certification process)	Global	Yes	Zero carbon energy target (100% renewable energy)	Transport emissions	To be considered in construction	Annual	Encouraged to publish action plan and annual progress reports	Endorsed by Bioregional
Green Star Communities (Emerging) [37]	Green Building Council Australia	Australia	Yes	100% renewable energy Residual emissions offset with nature based solutions	Low emission transport	Upfront carbon emissions reduced and offset	Annual	Zero carbon action plan	GBCA

33 Climate Active, "Carbon Neutral Standard for Precincts." 2022.
34 BRE Global Limited, "BREEAM Communities Technical Manual." 2017.
35 DGNB System, "DGNB System Districts Criteria Set." 2020.
36 Bioregional, "One Planet Living Goals and Guidance for Communities and Destinations." 2019
37 Green Building Council Australia, "Positive Category: Green Star Communities v2 Draft Credits Consultation." 2023

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Appendix 2
Communications Plan

Pathways to Net Zero Precincts
Communications Plan

Purpose of Document

This Communications Plan outlines the purpose, target audience, key messages and voice, and activities and channels of communication for the RACE for 2030 Pathways to Net Zero Precincts project. Timelines, budget, and metrics are also provided to support the delivery and analysis of the activities laid out in this plan.

Communications Objectives

The production of high impact external communications materials is a flagship element of the NZP project. In distilling, communicating and sharing this research through engaging communications content and channels, we hope to:

1. Accelerate the adoption and scaling of net zero practices in precincts, by empowering developers and policy makers with the knowledge and confidence to plan, build and govern net-zero precincts in the RACE for 2030
2. Make this research as practical as possible and as accessible as possible
3. Embody and demonstrate the values and practices we are endorsing – collaboration and transparent sharing of knowledge across industry, government, academia and civil society, for the greater good.

Stakeholder and Target Audience

Primary Target Audience

Industry and government who work in the built environment. In particular, decision makers and staff who are tasked with the remit to, or aspire to, effect sustainability-oriented change in their organisations.

Secondary Target Audiences

The academic and research community, particularly in the built form, sustainability and net zero spaces are an important audience with which we will communicate throughout the project. Much of our communications with this audience will be more technical and 'deep dive' content through publishing our research papers in academic journals and presenting at academic forums and events.

Project partners and funders are another important audience with which we will communicate throughout the project. However, our communications with this group has a significantly different purpose and will take place through different mediums to our public-facing communications.

Primary Target Audience Personas

The following personas have been developed to help us better to understand where to reach our target audience, and what messaging to use to connect with them.

Persona 1: Ashley, Government Official

Ashley is a Senior Manager in the WA Government Planning Department. She understands the urgency around the climate crisis, and wants to do her part, but is part of a typically conservative organisation. Ashley is trying to effect change and help steer the organisation in a more sustainable direction but is facing a lot of push-back. Part of the push-back is due to a lack of strong sources and reputable case studies to support her position. These challenges are causing her frustration, and she's losing both hope and interest in her job. Our goal is to provide Ashley with the information, material, support and confidence to drive change. We want to help her reignite her excitement, find new motivation and enthusiasm and share that with her organisation. We'll give her the backing, proof and sources she needs to sway her organisation and help save the planet.

Persona 2: James, Property Developer

James works for a property development company. He can see the writing on the wall around imminent policy changes and a market that's shifting to be more focused on reducing carbon-emissions in line with net-zero targets. He wants to make sure his company is not only ready for these changes, but positioned to take advantage of the shift.
His expertise is in property development, and needs to know where to get the right information around better ways to build. He also doesn't know where to start, and has no allies in the organisation to help him change the company's direction. To help him keep the company ahead of the change and avoid reputational damage, our mission is to give James the information, material and case studies he needs to understand the situation, and adapt to it.

End Goal: We want our target audience to feel confident to lead sustainable change in their organisation or project, armed with the knowledge, tools and resources to do so.

Key Messages

- Using real world case studies, and partnering with industry and government, this three-year research project is implementing innovative strategies for transitioning urban precincts towards net zero emissions. The learnings from which will be shared on our website netzeroprecincts.au
- Pathways to Net Zero Precincts is a three-year research project to develop and implement innovative strategies for transitioning urban precincts towards net zero emissions.
- A collaborative initiative between Curtin University, the RACE for 2030 Cooperative Research Centre and a consortium of leading industry and research partners from across the country, over 10 case studies will form the testing ground for these real-world interventions.

- With urban centres responsible for a significant portion of the world's greenhouse gas emissions, precincts are an important, and effective place to innovate to achieve net zero outcomes. Their practical scale allows technologies such as solar PV, batteries and electric vehicles to be readily incorporated into design and delivery. With good governance practices many resources and technologies can operate reliably and affordably at the precinct scale.
- Testing ideas, technologies and tools in real world case studies to accelerate the transition to net zero urban precincts.
- Globally significant research:
  - Over 10 real world case studies from across Australia
  - Collaboration across industry, government and academia
  - Uniquely focused on precincts, recognising the unique opportunities and advantages of applying interventions at this scale
  - Continuous learning across different typologies and stages of development
  - World leading research and world class academics.

Identity and Voice

When framing our communications it is useful to keep in mind our identity, what we value and how our message is carried. A defined, coherent and relatable personality gives us distinctiveness, and is what naturally leads us to having a voice that resonates and connects.

Our Values

Optimism We have hope for a bright future, and are confident in the value of the work we're doing. We aim to inspire people to action, through our actions and outlook on the world.	**Leadership** We're committed to leading the way in the RACE for 2030, and changing the world for the better. We lead by example, by getting stuck into the challenges.
Collaboration We share information, and support each other in the pursuit of net-zero.	**Innovation** We're always looking for ways to do things better, to improve and learn and grow.

Our Positioning

We provide high quality, applied-research, recommendations and resources that clearly demonstrate how to develop and govern precincts in a way that is more sustainable, cleaner, greener and liveable than ever before.

Our Point of Difference

Our research program is highly collaborative. Our research is highly pragmatic and action-oriented. Our research team is world class. This means our research is some of the most credible, useable and practical in the pursuit of net-zero precincts.

Our Personality

We offer our audience wisdom, expertise and the understanding to break new ground. We blend a desire to know things deeply with a passion for exploring innovative, better ways to solve challenges.

We're driven by the search for knowledge and a sense of adventure. We know that things need to be done differently, and we're committed to finding the answers.

Our Voice

We're quietly confident, self-assured and undeniably passionate, without being over-the-top. While we do have a sense of humour, we don't intentionally try to be funny or make jokes; we're respectful and considerate, calm and reassuring

Our tone of voice is primarily respectful and calm; enthusiastic and passionate without being frantic.

We keep our language clear and concise, to ensure the message and information aren't lost. To that end, while we are respectful, we're neither overly formal nor casual.

We're passionate and committed to our cause, but we're not judgemental or antagonistic. We're searching for a collaborative path to a positive future, not starting conflict.

Branding

The following is a summary of the branding assets and guidelines created for this project.

Logo

Logomark

Typography

Colour

Images

Stunning images of our case study sites and other net-zero, sustainable precincts and built environments are an important part of our visual branding. We will use images (still and moving) that invite and inspire people to want to live, work and play in these places, and ultimately, calling them to take action to support the creation or transformation of these spaces.

Acknowledgements

The following logos have been used to acknowledge all project partners in this first year. These logos/ logo lock is currently being updated to align with changes in project partners.

Curtin's support includes the CISCO Curtin Centre for Networks

When appropriate also acknowledge ***Supported by Curtin University's Faculty of Humanities*** Sustainable Futures Platform

When appropriate use Josh's title of Dean of Sustainable Futures, School of Humanities.

See full Branding Guidelines and all Branding Assets here.

Communications Activities and Channels

Website

The project's website is netzeroprecincts.au.

The website was designed and launched over the first six months of 2024. Website developer Dilate was contracted to deliver this work. Computing Australia is responsible for ongoing website maintenance, plug-ins and hosting. The Communications Manager is responsible for keeping all website content up to date and continuing to populate the site over the duration of the project.

The website will host all deliverables and outputs from the project including:

- Providing information about the project, the four pathways, each case study, our research team.
- Featuring the Web-video series and Podcast Series
- Hosting links to practical industry outcomes from the research such as fact sheets and templates.
- Hosting links to academic research papers produced from the research.
- Providing a sign-up form for individuals or organisation that want to be kept up to date.

Web-video Series

VAM Media are contracted to develop the video series for this project consisting of:

Outputs	Completion Date	Links to view
Episode 1 - Overview	**COMPLETE** – Launched at the SoERC Conference, Curtin Uni Feb 15 2024	https://youtu.be/-htHZSsx3wg netzeroprecincts.au
Episode 1 - Teaser	**COMPLETE** – Launched at the SoERC Conference, Curtin Uni Feb 15 2024	https://youtu.be/GMqR5h_HdaQ netzeroprecincts.au
Episode 2 – Pathway 1	February 2025	
Episode 2 – Teaser	February 2025	
Episode 3 – Pathway 2	June 2025	
Episode 3 - Teaser	June 2025	
Episode 4 – Pathway 3	Feb/March 2026	
Episode 4 - Teaser	Feb/March 2026	
Episode 5 – Pathway 4	May/ June 2026	
Episode 5 - Teaser	May/ June 2026	
Episode 6 - Summary	September 2026	
Episode 6 - Teaser	September 2026	
Case Study Vignette 1	Nov 2024	underway
Case Study Vignette 2	Nov 2024	
Case Study Vignette 3	April/May 2025	underway
Case Study Vignette 4	April/May 2025	
Case Study Vignette 5	Oct/Nov 2025	
Case Study Vignette 6	Oct/Nov 2025	
Case Study Vignette 7	March/April 2026	

The videos are all hosted on a project **YouTube channel**:
Handle: @NetZeroPrecincts
URL: https://www.youtube.com/channel/UCRvbhCDH2sm-4QSTL5YArxw

The web video series form significant content for the website and social media posts. They will also be played at relevant forums and events.

Photography Documentation

High quality photography has, and will continue to be taken, to document the project sites, key project activities, the research team and industry partners. These images are being used across the project platforms – website, social media etc.

Podcast Series

We intend to produce a podcast series, working with journalist Meri Fatin, to curate and deliver these. This content will be hosted on our website and be significant social media content. This activity is scheduled to take place across the calendar year of 2025 and into 2026.

Practical Industry Outputs

We will produce a series of fact sheets and templates to support the practical application of research findings into industry practice.

Academic Outputs

We will produce and publish research papers in academic journal. These deep-dive, technical papers will also be made available on the website.

Mailing Lists/ CRM

Email: A project email NZP@curtin.edu.au has been established for all project-specific communications.

MailChimp: A MailChimp account has been created for bulk email activities. It is linked to the above email address and the 'Stay Connected' sign-up form on the website, operating as a basic CRM system to collect, store and communicate with individuals and organisations interested in getting involved or staying up to date with the project's activities.

E-bulletins: We send out e-bulletins to share updates on significant research/project activities. This may go out to either our project partners (PSG) or wider to our CRM list.

Forums and Events

We aim to host at least 4 events related to the research over the duration of the project as well as attend and present at other relevant industry forums and events.

Date	Event	Our involvement
NZP initiated events		
28 November 2024	NZP hosts *Net Zero Certification for Urban Precincts* Forum	NZP curates and hosts this ½ day online forum
Attendance at third party events		
Feb 14-15 2024	State of Energy Research Conference (SoERC)	10min platform to share/launch our project

*this table will be updated as opportunities arise

Traditional Media

We will seek opportunities to feature the research in traditional media outlets where appropriate. Our traditional media strategy and contacts will be further developed in coming months.
We will leverage the capacity of Curtin Media and Communications team and their existing relationships with media outlets wherever possible.

Possible partnerships include:

- The Guardian
- Screen Australia –online digital
- Fifth Estate (Peter Newman already has established relationship with them)
- Renew Economy
- The Conversation (Peter Newman already has established relationship with them)

Social Media

We will use social media to amplify the reach of our research activities and content.
Given we have very limited staffing capacity to put towards social media we do not intend, at this stage, to create our own project-specific social media accounts. Instead, our strategy relies heavily on leveraging our network to cross-promote significant milestones and comms content on their social media platforms – with a focus on Linked-In and Instagram.

We will:

1. Produce primary socials content, initially posting it on the Curtin Humanities social media platforms and/or on our 'news/blog' page on the website
2. Notify our communications 'hit list' (see below), asking them to share/re-post the content.
3. We will capture metrics from this approach and re-assess in six months time re-assess if there is a need for the creation of our own social media accounts and/or more dedicated resourcing to support this activity.

UPDATE: New approach taken with social media assistant recruited in October 2024
Recognising the limitations of the project reach without active social media, towards the end of the project's first year of activity a casual social media assistant was recruited to support the creation, promotion and monitoring of social media activity for the project. We believe timing this recruitment ready for Year 2 of the project will allow maximum impact as research activities start to ramp up.

Sign-off Processes

The following sign-off protocol is followed for significant comms content.

Who	Branding	Website	Web-video series
CI/Project leader	✓	✓	✓
RACE for 2030 CRC program lead			✓
Curtin University		✓	✓
Academics who's research pathway is featured		✓	✓
'Talent' who is featured or industry partner who's project features significantly in content		✓	✓
Project Steering Group		✓	✓

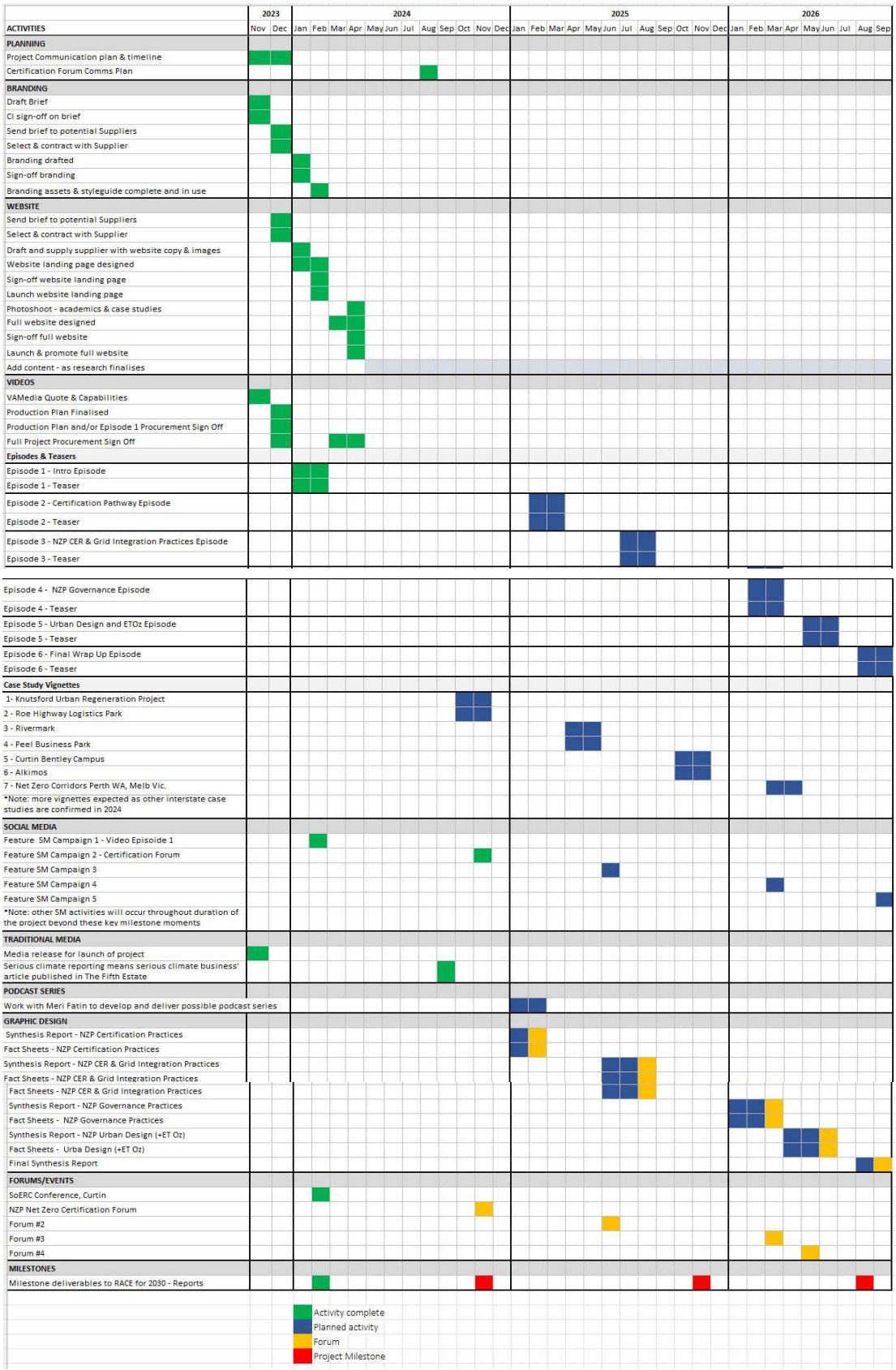
Metrics

The following communications metrics have been identified to measure the success of the communications activities as well as the success of the overall project - especially its impact on industry practice.

- Number of views of web-series videos (website analytics, YouTube analytics, SM analytics)
- Number of views/ listens of podcast series
- Number of attendees at forums/ events
- Number of views of website, time spent on website, click throughs in website
- Number of downloads of fact sheets or templates from website
- Number of downloads or click-throughs of research papers from the website
- Number of journal articles published, number of downloads of research papers published in journals

*This list will be expanded on over time.

Timeline


2023
2024
2025
2026
Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
ACTIVITIES
PLANNING
Project Communication plan & timeline
Certification Forum Comms Plan
BRANDING
Draft Brief
CI sign-off on brief
Send brief to potential Suppliers
Select & contract with Supplier
Branding drafted
Sign-off branding
Branding assets & styleguide complete and in use
WEBSITE
Send brief to potential Suppliers
Select & contract with Supplier
Draft and supply supplier with website copy & images
Website landing page designed
Sign-off website landing page
Launch website landing page
Photoshoot - academics & case studies
Full website designed
Sign-off full website
Launch & promote full website
Add content - as research finalises
VIDEOS
VAMedia Quote & Capabilities
Production Plan Finalised
Production Plan and/or Episode 1 Procurement Sign Off
Full Project Procurement Sign Off
Episodes & Teasers
Episode 1 - Intro Episode
Episode 1 - Teaser
Episode 2 - Certification Pathway Episode
Episode 2 - Teaser
Episode 3 - NZP CER & Grid Integration Practices Episode
Episode 3 - Teaser
Episode 4 - NZP Governance Episode
Episode 4 - Teaser
Episode 5 - Urban Design and ETOz Episode
Episode 5 - Teaser
Episode 6 - Final Wrap Up Episode
Episode 6 - Teaser
Case Study Vignettes
1- Knutsford Urban Regeneration Project
2 - Roe Highway Logistics Park
3 - Rivermark
4 - Peel Business Park
5 - Curtin Bentley Campus
6 - Alkimos
7 - Net Zero Corridors Perth WA, Melb Vic.
*Note: more vignettes expected as other interstate case studies are confirmed in 2024
SOCIAL MEDIA
Feature SM Campaign 1 - Video Episoide 1
Feature SM Campaign 2 - Certification Forum
Feature SM Campaign 3
Feature SM Campaign 4
Feature SM Campaign 5
*Note: other SM activities will occur throughout duration of the project beyond these key milestone moments
TRADITIONAL MEDIA
Media release for launch of project
Serious climate reporting means serious climate business' article published in The Fifth Estate
PODCAST SERIES
Work with Meri Fatin to develop and deliver possible podcast series
GRAPHIC DESIGN
Synthesis Report - NZP Certification Practices
Fact Sheets - NZP Certification Practices
Synthesis Report - NZP CER & Grid Integration Practices
Fact Sheets - NZP CER & Grid Integration Practices
Fact Sheets - NZP CER & Grid Integration Practices
Synthesis Report - NZP Governance Practices
Fact Sheets - NZP Governance Practices
Synthesis Report - NZP Urban Design (+ET Oz)
Fact Sheets - Urba Design (+ET Oz)
Final Synthesis Report
FORUMS/EVENTS
SoERC Conference, Curtin
NZP Net Zero Certification Forum
Forum #2
Forum #3
Forum #4
MILESTONES
Milestone deliverables to RACE for 2030 - Reports
Activity complete
Planned activity
Forum
Project Milestone

Communications Activities Metrics and Analytics Year 1

This document captures metrics for communications activities conducted in the first year of the Pathways to Net Zero Precincts project.

Website

Since its launch in May 2024, 1,200 different people have visited and interacted with the netzeroprecincts.au website with peak engagement coinciding with significant project communications activities including website launch, media publications and forum event promotions.

Figure 1: Visitors to NZP website since its launch in May 2024

Website visitors primarily come from direct traffic (>800), with over 200 from organic searches, and significantly less from referrals and organic socials. Predictably, the majority of visitors are from Australia. There is an interesting spread of interest from other countries around the world including, most significantly, India, Unites States, Philippines, Singapore and South Korea.

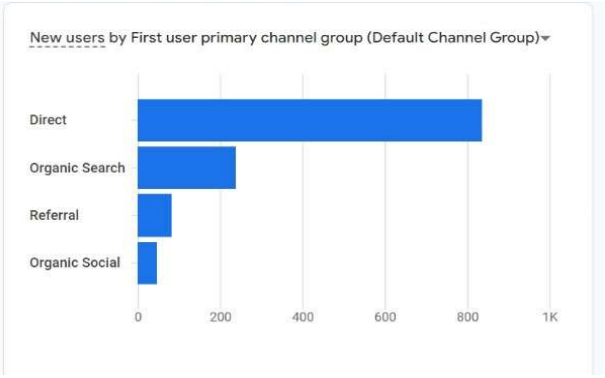


Figure 2: Source of website traffic – how are viewers being directed to the NZP website

Figure 3: Geographic location of website viewers

Within the website the most viewed pages include the landing page, information on our research team and the case studies.

Views by Page title and screen class

PAGE TITLE AND SCREEN ...	VIEWS
Pathways to Net Zero Precin...	1.7K
Our Research Team - Pathwa...	400
Case Studies - Pathways to ...	393
Building for Sustainability | P...	331
Knutsford Urban Regenerati...	246
Contact Us - Pathways to Ne...	160
Pathway - Urban Design - Pa...	144

Figure 4: Most viewed pages across the NZP website

Our mailing list, being collated through a sign-up form on the website currently has 30+ individuals signed up. These individuals come from a mix of backgrounds across government, private sector, and academia. Given the case studies and project activities to date have been located in Western Australia it is not surprising that a large percentage of the individuals on the mailing list work and reside in WA.

Videos

A video channel on YouTube was set up to host the videos created for this project, from with the videos can be embedded and shared on our website and social media. This YouTube channel has 17 subscribers. The full Episode 1 video, launched in February 2024, has had 269 views and the Episode 1 Teaser video has had 241 views to date.

Traditional Media

The project has produced two traditional media releases and pitches in its first year. These were created for the launch of the NZP project in October 2023 and in the lead up to the Certification Forum to be held in November 2024.

The research team has published one Media publication for the project - *Serious climate reporting means serious climate business* article by Professor Peter Newman and Angelina Bowden-Jones, published in the Fifth Estate.

Social Media

Throughout the first year of the project, we have leveraged Curtin Humanities social media platforms Linked-In (1,156 followers) and Instagram (395 followers) to share project activities publicly, and asked partners and project members to share content from these sources.

The following table outlines some preliminary engagement analytics.

Date	Instagram Post	Like	Comment	Save	Share	Linked-In Post	Like	Comment	Repost
6 Nov 2023	Callout for PhD Scholarship for project	9	0	0	0	CIET call for PhD	31		11
20 Feb 2024	Video launch	18	0	2	3	Video launch	55	2	4
4 June 2024	NZP website launch	3	0	0	0	NZP website launch	11		5
21 Oct 2024	NZP Certification Forum promo	11	0	0	0	NZP Certification Forum promo	24	1	8

Table 1: Social Media metrics

On their own, these engagement numbers are relatively low. The project reach on social media is significantly boosted by other key partner posts including RACE for 2030 and some of our researchers with larger social media profiles. We recognise there is potential benefits to be gained for the project from more focused and resourced efforts in the social media space moving forwards and intend to do so in our second year of communications activities.

Presentations and Events

NZP's first public industry event will be the Net Zero Certification for Urban Precincts Forum to be held in November this year.

The NZP project and researchers have also been featured in the All Energy Conference in Melbourne (October 2023), ERICA State of Energy Research Conference in Perth (February 2024), The Property Council of Australia's Future Cities Summit in Sydney.

In June 2024 three of the project's PhD candidates presented at the RACE PhD onsite event in Sydney.

NZP Team - Staff

Project Management Team

Prof. Josh Byrne
Chief Investigator

Josh is an environmental scientist and urban design professional with a national profile as a consultant, researcher and communicator in urban sustainability. His approach is leadership through demonstration by engaging in projects that provide opportunities to test innovation, build capacity and share learnings with stakeholders and the wider community. Josh's research expertise spans water sensitive design, low carbon housing and sustainable urban development and he has authored a number of academic publications, industry guides, factual video series and popular books in these fields. He is Dean of Sustainable Futures in the Faculty of Humanities where he supports learning and teaching, research and partnership activities. Josh's unique skill set and interdisciplinary approach to practice, research, policy and communication has been acknowledged by numerous industry awards including the Australian Water Association WA Water Professional of the Year and the Planning Institute of Australia WA Planning Champion.

Prof. Peter Newman
Chief Investigator and
Professorial Lead
Certification Pathway

Peter Newman is Professor of Sustainability at Curtin University in Perth, Australia. Peter is an academic who has written 20 books and over 350 papers on sustainable cities with a global reputation and has worked to deliver his ideas in all levels of government. Peter has worked in local government as an elected councillor in Fremantle, in Western Australia's state government as an advisor to three Premiers and in the Australian Government on the Board of Infrastructure Australia and the Prime Minister's Cities Reference Group. He is the Co-ordinating Lead Author for the UN's IPCC on Transport. In 2014 he was awarded an Order of Australia for his contributions to urban design and sustainable transport particularly for his work in saving and rebuilding Perth's rail system. In 2018/19 he was the WA Scientist of the Year. He is the Editor-in-Chief of the Springer journal Sustainable Earth.

Assoc. Prof. Nasrin
Aghamohammadi
Project Manager

Nasrin Aghamohammadi is an Environmental Engineering professional focusing on Sustainable Cities and Society. Her research focuses on urban overheating, innovative mitigation strategies, sustainability policy, air quality, thermal comfort, health impact assessments, walkability, alert systems, net-zero emissions, and technologies for the waste and water-energy nexus. She is an Adjunct Professor at the University of Malaya (UM). Previously, she was an Associate Professor at UM, leading the multidisciplinary grand challenge program on the urban heat island phenomenon in a tropical city and mitigation approaches since 2015 in Greater Kuala Lumpur. She has lectured at various faculties and universities, including Malaysia, the USA, Japan, China, and Iran. Nasrin is an Associate Editor for the International Journal of Sustainable Cities and Society, published by Elsevier, with a Q1 rating and an Impact Factor of 11.7.

Aimee Smith
Communications
Manager

Aimee Smith is a sustainability and climate change researcher, communicator and practitioner who has worked at the intersection of climate change, sustainability, creativity and community for 20 years – across government, business, not-for-profits and education. With a Masters in Sustainability and Climate Policy, Aimee is particularly passionate about the power of culture, storytelling, community building and radical collaboration in creating a more just, sustainable and beautiful future for all of us. At Curtin Aimee leads the delivery of the Leadership in Sustainability Unit as part of the Masters in Environment and Climate Emergency; is the inaugural Planet Positive Learning Community Coordinator; and is the Communications Manager for the RACEfor2030 Pathways to Net Zero Precincts research project.

Catalina is a passionate architect with more than 10 years of experience in commercial and residential development. Her journey has fostered a keen interest in sustainability, climate change issues and design innovation, which encouraged her to move to Australia to pursue a master's degree in Environment and Climate Emergency. She believes architects play a pivotal role in shaping a more sustainable built environment by incorporating sustainable design strategies, advocating for policy change, and promoting resilient communities. Australia has further developed her passion and inquisitiveness for urban design and sustainable transport.

Catalina Corredor Garnica
Research Assistant

Certification Pathway Team

Peter Newman is Professor of Sustainability at Curtin University in Perth, Australia. Peter is an academic who has written 20 books and over 350 papers on sustainable cities with a global reputation and has worked to deliver his ideas in all levels of government. Peter has worked in local government as an elected councillor in Fremantle, in Western Australia's state government as an advisor to three Premiers and in the Australian Government on the Board of Infrastructure Australia and the Prime Minister's Cities Reference Group. He is the Co-ordinating Lead Author for the UN's IPCC on Transport. In 2014 he was awarded an Order of Australia for his contributions to urban design and sustainable transport particularly for his work in saving and rebuilding Perth's rail system. In 2018/19 he was the WA Scientist of the Year. He is the Editor-in-Chief of the Springer journal Sustainable Earth.

Prof. Peter Newman
Chief Investigator and
Professorial Lead
Certification Pathway

Hugh Finn is a Lecturer in the Curtin Law School where he currently lectures in Constitutional Law, Administrative Law, and Environmental Law and Policy. Hugh's research interests are in legal and policy frameworks for climate change and wildlife conservation, environmental law and policy, and animal law. Hugh has worked previously as a wildlife biologist, and has conducted field research with marine mammals and black cockatoos. Hugh was the chairperson of the Environmental Defender's Office of Western Australia (Inc) in 2019 and 2020.

Dr. Hugh Finn
Technical Lead
Certification Pathway

Angelina is an Environmental, Social, Governance (ESG) Leader who is a PhD candidate exploring net zero precinct certification pathways for different urban fabrics in Australia to complement experience implementing ESG programs and projects, and an in-depth understanding of industry best practices and global regulatory environments. Angelina designed and established the ESG strategy, function and team structure for the Crown Resorts Group, and managed their ESG compliance obligations. These included National Greenhouse and Energy Reporting, NABERS ratings, Climate Active reporting, Green Star reporting, single use plastic bans in WA, Victoria & NSW, the Australian Packaging Covenant and Modern Slavery reporting requirements. Angelina is a member of Chartered Accountants Australia and New Zealand has more than 20 years of experience in tax across various jurisdictions around the world.

Angelina Bowden-Jones
PhD Researcher NZP
Certification

CER and Grid Integration Pathway Team

As Director of Curtin Institute for Energy Transition, Peta brings over thirty years of experience working in senior management and research including having established and led the Science into Society Group (SISG) within CSIRO's Division of Earth Science and Resource Engineering. Well known for her expertise in the energy field, communication and stakeholder engagement and technology assessment. She has been researching public attitudes to climate and energy technologies for the past decade and grew up on a farm in the south west of WA where her love of nature grew from a young age.

Prof. Peta Ashworth
Professorial Lead CER and Grid Integration Pathway

Dean bridges the gap between research and the market, specialising in digital disruption across sectors as diverse as transport, telecommunications, media, health and transport. He co-founded telecommunications vendor QPSX and directed the CSIRO Lab which earlier created fast Wi-Fi. He also co-founded the Smart Services Cooperative Research Centre and was appointed Director Infrastructure, Transport and Logistics at National ICT Australia (now CSIRO Data 61). Dean later joined Telstra as Chief Technology Officer for Products, working across many parts of Telstra with a special interest in future transport technologies and was also appointed Chief Transport Strategist.

Dr. Dean Economou
Technical Lead CER and Grid Integration Pathway

Dr Himanshu Agrawal serves as a Senior Lecturer at School of Electrical Engineering, Computing, and Mathematical Science, Curtin University specialising in networking and security. He earned his PhD from RMIT University, and has focused his career dedicated to advancing knowledge in networking, Internet of Things (IoT), applied AI/ML, Simulation and Modelling and Privacy Preservation. Dr Agrawal's academic journey included a Visiting Associate Professorship at IoT Lab, Swinburne University of Technology (2019-2020) collaborating on a CRC-P with Prof. Dimitrios Georgakopoulos. Since joining Curtin in 2020, he has been recognised as a multi-disciplinary research investigator, contributing to research grants totalling to $3.5 million including significant projects like RACE 2030-NZP ($2.8 M) and Healthy Connections($607K). His research work is cited over 1000 times (Google Scholar, h-index 18) in more than 60 papers alongside a patent (Grant-Pending) for 'Drown Support System'. He also serves as an editorial board member with MDPI and Frontiers in IoT journals.

Dr Himanshu Agrawal
Key Researcher
Digital Twin

Aditi joins the project after 13 years in the energy industry working electricity market design, policy and regulation. Prior to that, she worked in public health and social research for 8 years in India. She has a Master in Public Policy from Carnegie Mellon University, USA and a Master in Economics from Delhi University, India.
Aditi was attracted to the idea of trialling full grid integration for consumer energy resources to support net-zero strategies at a precinct scale and amplifying the learnings to grid scale. The partnership between academia and industry was an important factor for me as I am keen to leverage my industry knowledge and network to increase collaboration with academia.

Aditi Varma
PhD Researcher NZP CER and Grid Integration

Urban Design Pathway Team

Professor Reena Tiwari is a prolific researcher, focusing on space psychology, place-making, urban ethnography, and sustainable transport. Her work is grounded in the philosophy of democratic urbanism, employing an ethnographic, collaborative, and trans-disciplinary model to foster change and adaptation in urban environments. Reena has been a Visiting Professor and Scholar at University of California, Berkeley with a focus on sustainable transit corridors. As a Visiting Professor at University of Catalunya, Barcelona, she has had a continued involvement in the International Cooperation Program under the Erasmus Mundus umbrella, supported by UNESCO and UN Habitat.

Prof. Reena Tiwari
Professorial Lead Urban Design Pathway

Swapan has a Ph.D. (Urban and Regional Planning) awarded in 2013 from Curtin University, Australia; He received a Master of Environmental Studies in 2007 from Victoria University of Wellington, New Zealand and a Bachelor of Urban and Rural Planning (BURP) in 2001 from Khulna University, Bangladesh. Swapan joined Curtin as a Lecturer in 2013 and is currently Director, Graduate Research in the School of Design and the Built Environment . His research interests and Ph.D. supervision include community perceptions of environmental spaces; water-sensitive and liveable communities; green adaptation; ecosystem services; urbanisation of the Global South.

Assoc. Prof. Mohammad Swapan
Assoc. Professorial Lead Urban Design Pathway

Yongze Song leads a Geospatial Analysis and AI team, maintaining strong industry networks and delivering industry-driven research projects about sustainable infrastructure management using emerging technologies. He developed more than 16 new geospatial methods and 8 R software packages with over 120,000 downloads for understanding geographical and spatial data. He published 70 peer-reviewed journal articles, including 7 highly-cited papers. He is a recipient of more than ten awards at international and national levels, such as the Geospatial World 50 Rising Stars, the Global Top 10 Young Scientist Award, World's Top 2% Scientists by Stanford University, and the Australian National Location Data First Prize. He is an Associate Editor for the International Journal of Applied Earth Observation and Geoinformation (Q1), and GIScience & Remote Sensing (Q1).

Dr. Yongze Song
Key Researcher Urban Design (GIS)

Dr Shengping (Stephanie) Li is a Lecturer at Curtin University. Before this, she was awarded a CSIRO Early Research Career fellowship and worked as a postdoctoral research fellow at CSIRO, contributing to the "Towards Net Zero" project in Australia. She received her PhD degree at the University of Melbourne. Dr. Li's research covers Sustainable Construction, Decarbonisation of the Built Environment, Building Energy Efficiency, Material Flow Analysis, and Life Cycle Assessment. Her involvement extends to nine research projects funded by a variety of institutions across International Energy Agency, Australia, Singapore, and China. Dr. Li has served as a scientific and organizing committee member at international conferences and has been invited to present her research at international conferences. Moreover, she is a member of Engineers Australia, the International Society for Industrial Ecology, and Member of the American Society of Civil Engineers.

Dr. Shengping (Stephanie) Li
Key Researcher Urban Design (LCA)

Faz Ikram
Technical Coordinator
and PhD Researcher
NZP Urban Design
(Economics)
Urban Design Pathway

Faz Ikram has accumulated more than 17 years of experience in the financial services and capital markets industry and has held leadership positions in well-established financial institutions in Malaysia and Japan specializing in construction and building materials. He has drafted policy papers, parliamentary briefings and research notes for Transit Oriented Development, trackless trams, high speed railway, and last mile connection for Ministry of Federal Territories, Ministry of International Trade & Investment and Ministry of Works in Malaysia within the role of a Senior Aide to Minister and Associate Director/Senior Analyst. Prior to assuming the role as PhD candidate in Curtin University, he was the Group Finance Director of JT Technology Asia Pacific and Junex Asia in Tokyo. He is a Fellow Chartered Management Accountant of Chartered Institute of Management Accountants, United Kingdom, Certified Practising Accountant of CPA Australia and Chartered Member of Chartered Institute of Logistics and Transport of United Kingdom.

Governance Practices Pathway Team

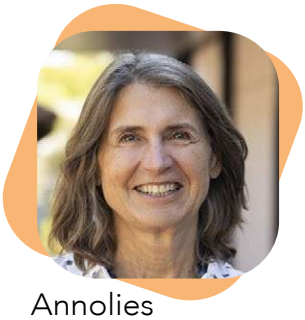
Petra Tschakert, Professor of Geography and Global Futures in the School of Media, Creative Arts and Social Inquiry at Curtin University, is trained as a human-environment geographer and applied anthropologist. Her research is mainly on climate change adaptation and structural inequalities and now also on energy justice and inclusive governance. The latter entails questions on how decisions about decarbonisation are made and by whom and how to foster stakeholder dialogue, deliberation, and experimentation towards equitable energy transitions. Prof. Tschakert brings extensive expertise in participatory methodologies to examine power differentials and validate diverse voices. She leads the Energy Humanities Initiative at Curtin and is the main organiser of the Petrocultures 24/South conference to be held in Perth in November 2024. She was Coordinating Lead Author with the Intergovernmental Panel on Climate Change (IPCC), for the Fifth Assessment Report (2014), Working Group II, and the Special Report on 1.5°C Global Warming (2018).

Prof. Petra Tschakert
Professorial Lead
Governance Practices
Pathway

Margaret Gollagher
Technical Lead
Governance Practices
Pathway

Margaret has been working as a sustainability consultant, manager, policy adviser, lecturer and researcher for over 20 years in the private and public sectors. She has led and been involved in sustainability projects in areas such as corporate sustainability, urban land use and transport planning, infrastructure, regenerative agriculture, symbiotic and biological nitrogen fixation, sustainability and SMEs, climate change policy, greenhouse gas emissions reporting, behaviour change, water policy, energy policy, active transport, environmental regulation, low carbon living, waste, and economics.
Margaret designs and facilitates participatory processes that enable people to solve problems collaboratively. She has been a sustainability lecturer and researcher at Western Australian universities since 1998.

Annolies Truman (BA, DipEd, MATS, MCouns) is a counsellor, educator and environmentalist with a long history in sustainability and person-centred engagement. She has worked as a Waste Reduction Officer at South Sydney Council, facilitated community education in sustainability and taught permaculture to high school students and adults. Annolies has worked with First Nations, CALD and other diverse populations. She has managed teams in educational and health-care settings. She has designed and delivered a staff wellbeing program in a tertiary hospital. As part of her counselling practice, Annolies runs eco-distress workshops and offers group and individual counselling for people grappling with the ecological crisis and supervision for those working in the area. Annolies is involved in community environmental initiatives, including Nannine Common community garden and Beacon Net Zero. She is researching NZP governance, drawing on lived experience and concepts of user engagement and energy democracy.



Annolies
Truman
PhD Researcher NZP
Governance Practices

Pathway to Net Zero Precincts
Industry PhD Integration

Industry PhD integration - Pathways to Net Zero Precincts								
PhD Student	**Pathway**	**Topic**	**Start Date**	**Finish Date**	**Milestone dates**	**Involvements in Outputs**	**Industry Mentors**	**Engagement with IRG**
Angelina Bowden-Jones	Certification	A framework that enables integrity to achieve net zero certification at the urban precinct scale.	12/2/2024	12/2/2027	M1 - June 2024 (passed) M2 - June 2025 M3 - December 2026 Thesis submission - 12/2/27	Assisted with the following for the Certification Forum: - design & engaging speakers - primary author of the Forum Paper - Presented and served as the MC for the event.	Adam Carrel Partner I Climate Change and Sustainability Services Ernst & Young	Through the design of the Certification Forum
Aditi Varma	CER & Grid Integration	Improving distribution network design and capacity planning to enable greater DER integration	1/10/2024	1/10/2027	M1 - March 2025 M2 - March 2026 M3 - July 2027 Thesis submission - Oct 2027	Assist with economic and policy aspects	Mark Timson (proposed) Western Power	Attended first IRG meeting
Ben James	CER & Grid Integration	Increasing the hosting capacity of renewable energy sources in distirbution networks	1/6/2024 *	31/12/2025	M2 passed M3 - Dec 25 Thesis Submission - Mar 2026	Assist with technology evaluation	Mark Hibbert EleXsys Energy plc	Worked with some IRG members in Western Power internship
Annolies Truman	Governance Practices	Governance practices for the integrity and sustainability of Net Zero Precincts.	23/2/2024	23/2/2027	M1 -Sept 2024 passed M2- Sept 2025 M3- Nov 2026 thesis submission 23/02/2027	Survey to WA case study stakeholders	Liam Mouritz Principal Urban Designer City of Fremantle	Engagement with IRG through meeting and workshops
Faz Ikram	Urban Design/ET-Oz	Urban Design and Financial Analysis through Envision Tomorrow - A Practical Policy Tool for Net Zero Precincts and Corridors.	5/2/2024	20/12/2026	M1 - Aug 2024 (passed) M2 - November 2025 M3 - November 2026 Thesis submission - December 2026	Assisting with data analysis and industry best practices.	Warren Philips St. Barts	Engagement with IRG through meeting and workshops
Issana Meria Burhan	Urban Design/ET-Oz	Mainstreaming The Net Zero Carbon City Agenda: Integration Of Urban Metabolism Approach Into Green Infrastructure Planning	27/3/2022	27/3/2026	M1 - Sep. 2022 (passed) M2 - November 2023 (passed) M3 - November 2025 Thesis submission - March 2026	Incorporating Green Infrastructure to ETOz model in terms of Energy Efficiency and Carbon sequestration	Melissa McGrath Principal for Sustainability JBA	Engagement with IRG through meeting and workshops

*Moved from RACE for EVs to RACE for Change

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