

# Pathways for Urban Renewable Energy Zones

Report at a glance



## Progress report

### RACE for Network Program

N4 Pathways for Urban Renewable Energy Zones  
Barriers, opportunities and impacts of establishing a UREZ

Project Code: 21.N4.F.0152

Copyright © RACE for 2030 Cooperative Research Centre, 2022

ISBN: 978-1-922746-25-2

December 2022

## Project team

Climate-KIC Australia

- Dr Genevieve Mortimer

Institute for Sustainable Futures, UTS

- Dr Scott Dwyer
- Dr Jaysson Guerrero Orbe

Curtin University

- Dr Sumedha Rajakaruna
- Dr Angie Silva
- Dr Ehsan Pashajavid
- Dr Dilan Amarasinghe

### What is RACE for 2030?

RACE for 2030 CRC is a 10-year co-operative research program with AUD350 million of resources to fund research towards a reliable, affordable, and clean energy future.

<https://www.racefor2030.com.au>

### Project Partners



### Acknowledgements

We would like to thank the Industry Reference Group Electric Power Research Institute (EPRI), Balance Services Group, Development WA, Energy Efficiency Council, Cities Power Partnership, Energy Policy WA, Partners in Performance, Coalition for Community Energy (C4CE) for their contributions.

### 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.

Disclaimer

The authors have used all due care and skill to ensure the material is accurate as at the date of this report. The authors do not accept any responsibility for any loss that may arise by anyone relying upon its contents.

---

## **What is the report about?**

The report explores how Urban Renewable Energy Zones (UREZ) could best support the integration of rapidly increasing Distributed Energy Resources (DER) into reliable and cost-competitive energy systems. It aims to fill knowledge gaps and build capability for local councils, communities, companies and network providers to create a pathway for demonstration and replication of UREZ.

## **Why is it important?**

State governments, local councils, and organisations with committed 2050 net zero operational targets are looking for ways to achieve 100% renewable electricity and to efficiently manage this energy supply. An increase in community energy solutions and DER is supporting this transition.

The challenge is that our current energy system cannot handle unchecked increases in DER. Our modelling showed that significant increases in rooftop solar would cause voltage deviations above the technical standard of the network in some urban areas. This dilemma is reaching a critical point as the promise of more self-reliant, abundant, and cheaper energy seems within reach, but the pathway is blocked because of perceptions that a new energy management paradigm may challenge the reliability of the current system. A successful transition is needed to harness community momentum and the inherent capability for local energy to enable future energy balance and network services at the distribution level to incentives more and quicker electrification of urban assets.

## **What did we do?**

The project team brought together universities, State governments, technology providers, industry experts, electricity network businesses, and energy retailers to explore how UREZ can accelerate DER investments in our cities whilst maximising the use of existing grid infrastructure and driving community benefits. The process involved stakeholder consultation, desktop research and network modelling to synthesise recommendations for the report. A power flow analysis was conducted on two potential UREZ case study regions: Midland, Western Australia and Warringah, New South Wales. The report identified the drivers and stakeholder perspectives behind UREZ, its scope, and how it can be designated, implemented, replicated, and scaled to regions across Australia.

## **What difference will it make?**

The emerging consensus was that DER, enabled through a UREZ approach, would provide a pathway to cheaper, cleaner energy for communities while simultaneously providing broader benefits to the energy systems. We found three interrelated types of new value that a well-implemented UREZ could deliver:

- 1) reduce the cost and increase in the value of local electrification
- 2) enhance grid performance and reduce cost of grid upgrades, and
- 3) increase participation, attract investment to a region and amplify entrepreneurship and innovation.

Hence, at its core the UREZ represents an energy transition path that can be a win-win for both the energy system and communities.

## **What's next?**

The research has led actions towards UREZ demonstrations by pursuing implementation through two parallel pathways: technical studies for a detailed UREZ control model design and stakeholder engagement process to leverage a commercial deal. Curtin University will pursue the technical control strategy with relevant control layers that are required for its implementation in a UREZ. Climate-KIC and UTS will continue to develop the stakeholder engagement pathway to implement at least two UREZs, with 50 (or more) UREZs to be developed by 2031.

