

RACE for
2030

RELIABLE
AFFORDABLE
CLEAN
ENERGY

The RACE to Net Zero Business

The RACE to Net Zero Business



Dani Alexander

Program Leader, RACE for Business

Big audacious goals are useful to galvanise action. A clear pathway to achieving the goal is even more important to test its feasibility and maintain stamina through the inevitable challenges that face something that has never been done before. While more and more businesses commit to “net zero” there is still a lack of understanding of how most will actually get there.

Speakers



David Roche
Research Principle, ISF



Andrew Weller
Business Development Manager



Steve Hoy
CEO



Dorota Bacal
Capacity Builder



The Green Wave: Anchoring economic recovery through Net Zero energy strategy

RACE for
2030



Buildings **Alive**

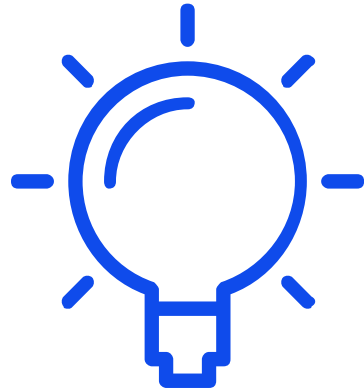
(Energy)^{Lab}



Ultima Capital Partners

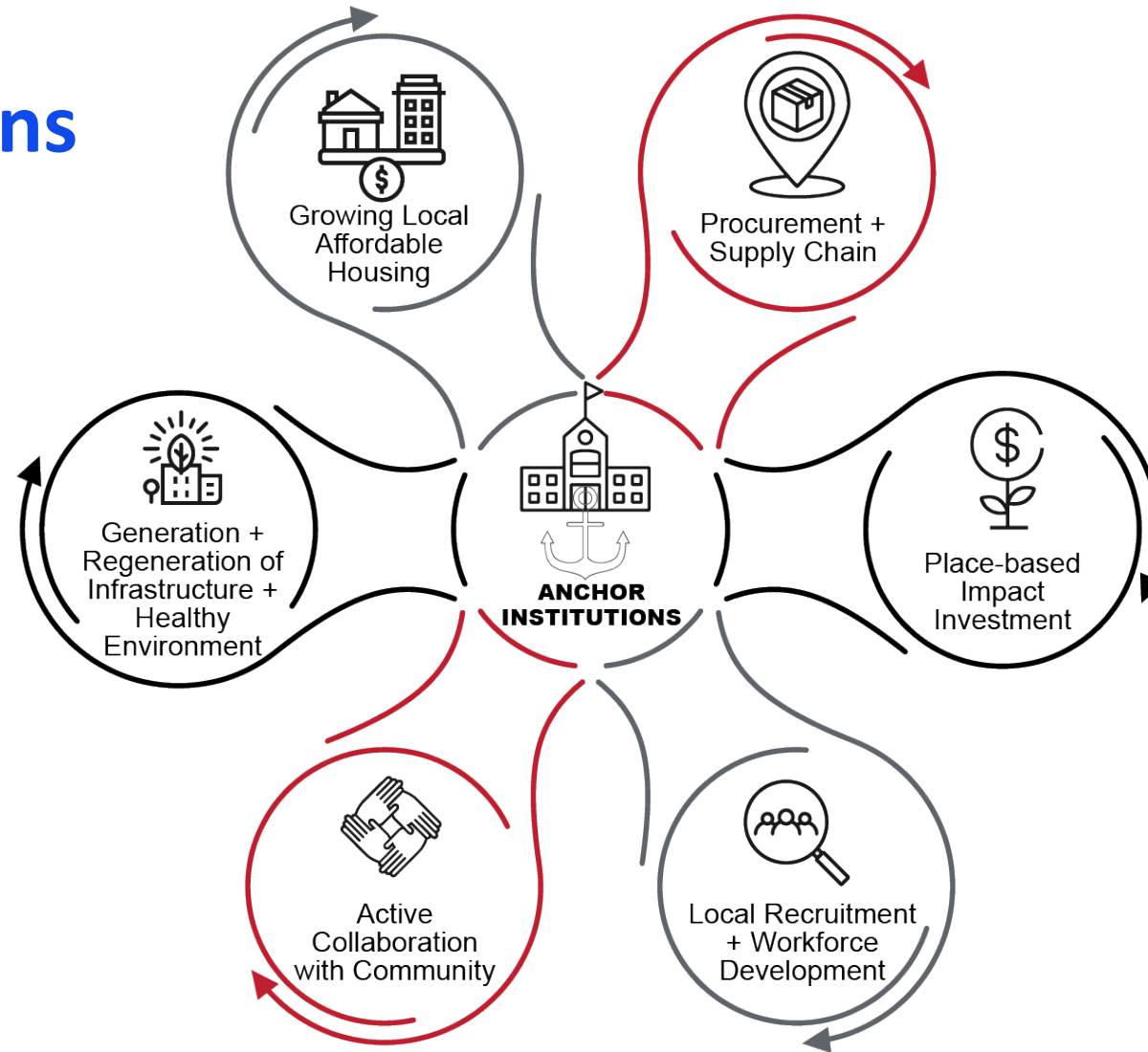


Project objectives

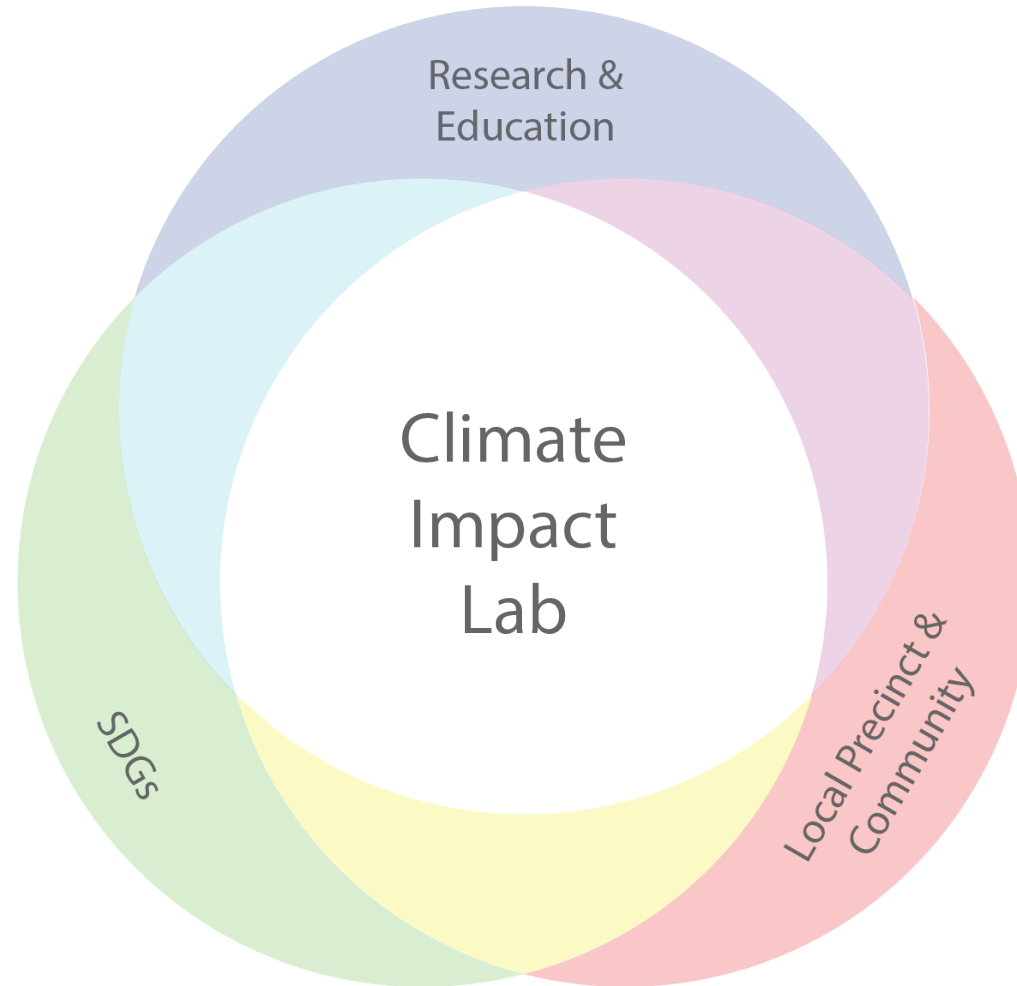


“Identify how Net Zero strategies can more deeply engage community and business partnerships to deliver greater trust, legitimacy and social value”

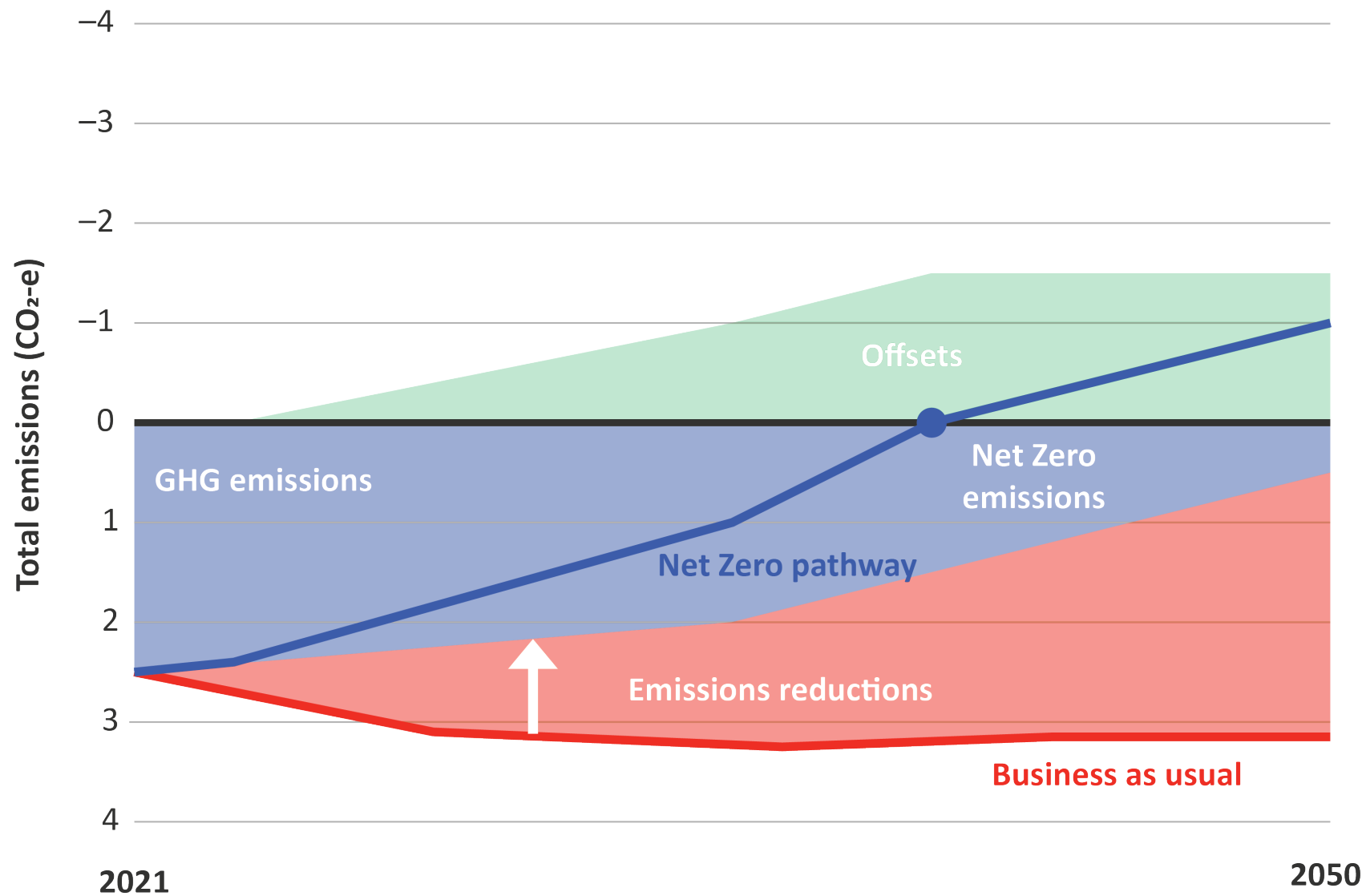
Universities as anchor institutions



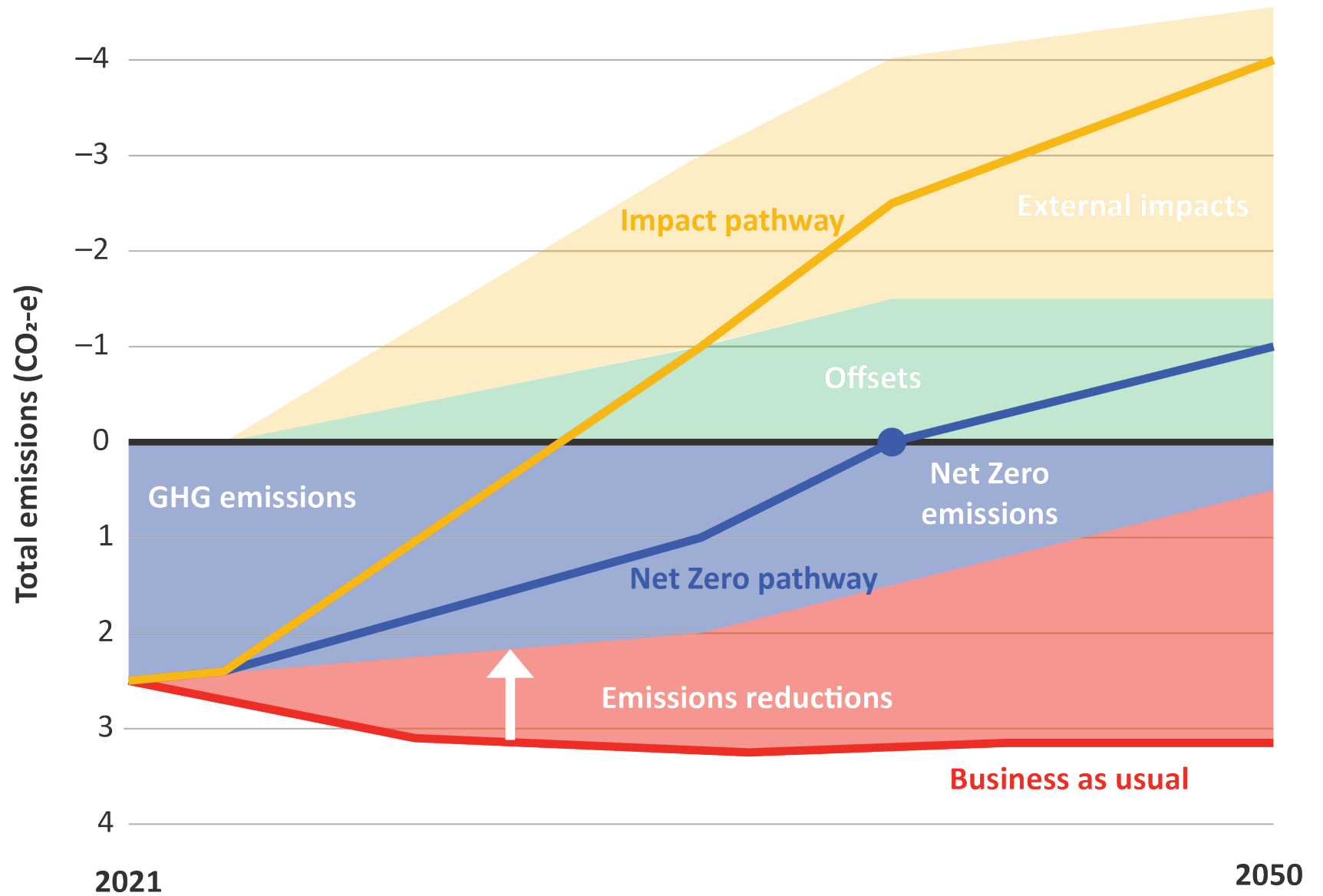
Universities as living laboratories



Net Zero pathway

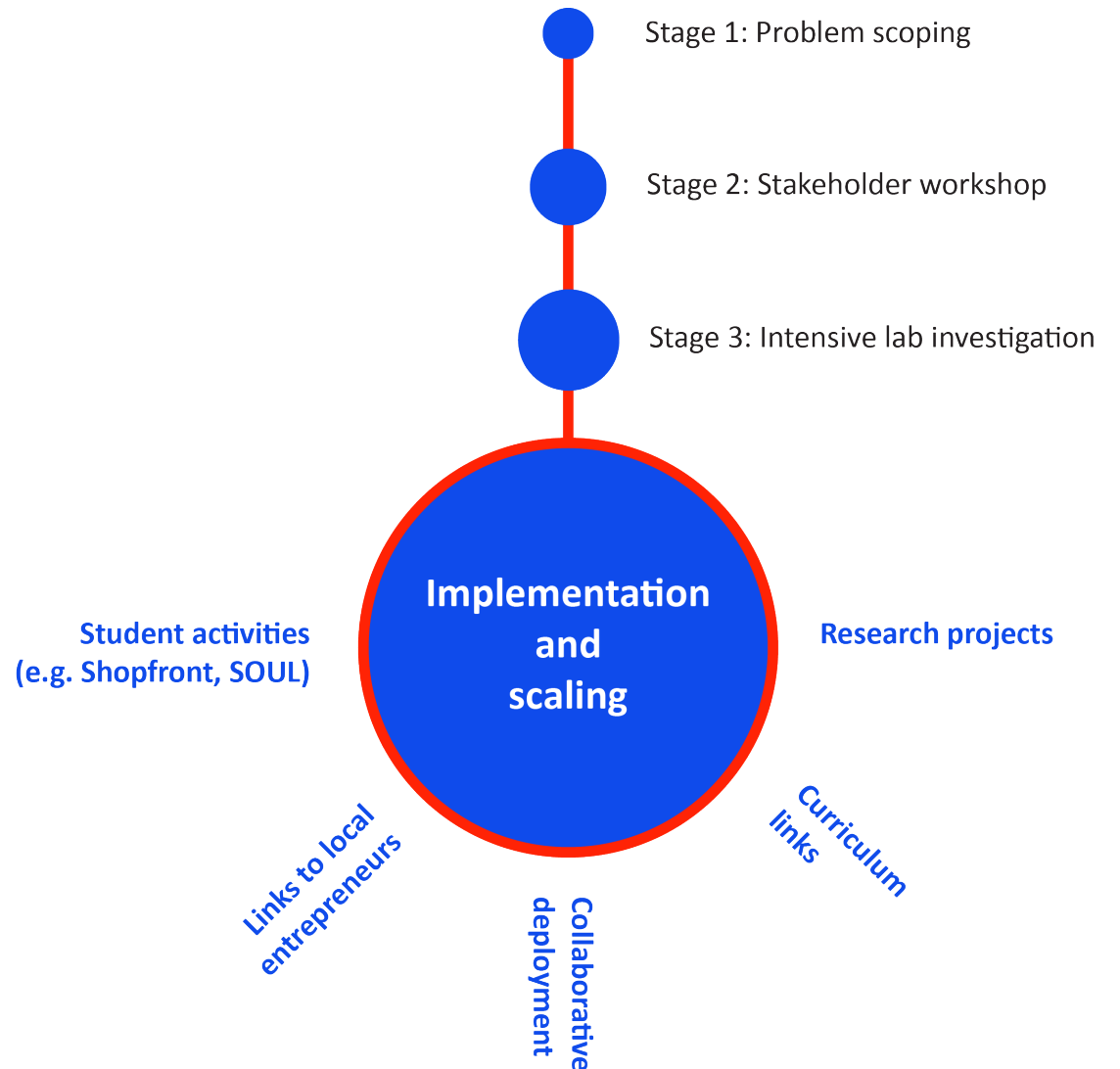


'Impact' pathway

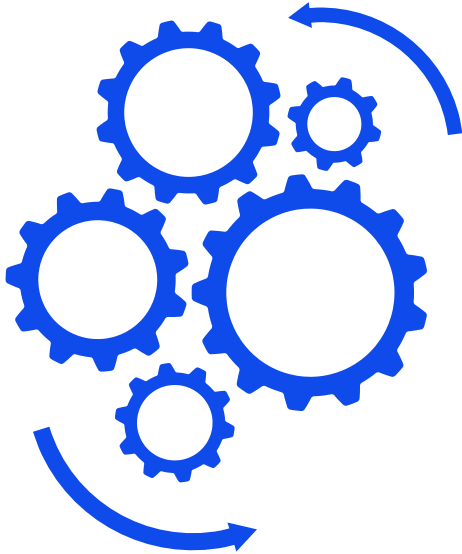


Example: Climate Impact Lab

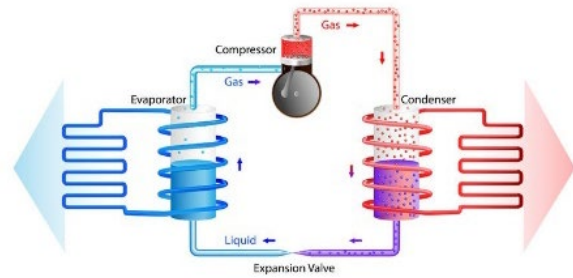
- Establish a **Climate Impact Lab**
- Address specific climate challenges
- Harness expertise across university
- Involve both research and education
- Connect with community, industry and local partners
- Apply collaborative, transdisciplinary thinking to solve climate challenges
- Test, accelerate and scale solutions



Example: Addressing Scope 2 (electricity) emissions



- **Direct PPAs**—Use university as ‘anchor’ to fund building of new renewable energy assets through direct Power Purchasing Agreements
- **Better building management**—Better manage demand to reduce running costs and support 100% renewables
- **Battery**—Install a battery to firm new RE capacity (and provide research and teaching opportunities)
- **Retail offering**—Partner with retail licensee to sell excess capacity to staff, students and/or local community through 100% renewables retail offering
- **Pilot**—Pilot this strategy, beginning with a single building



CO₂ Heat Pumps

- For mixed heating and cold demand: Effectively what is normally wasted is utilised and comes for “free”
- Very high Coefficient of Performance (4-8+)
- Ideal for LPG/NG gas displacement and the supply of 85° hot water



Thermal Energy Storage

- Industrial scale from 100kWh to multi-mWh
- Phase Change Materials for higher storage density
- Supporting applications: with industry-leading range of freezing temperatures from -27°C to 0°C
- Levelised cost of storage 3.5 to 7x < batteries
- Phase Change Materials have long lives & minimal degradation for lower operating cost



ACFA Smart Software (Advanced Control & Forecasting Algorithm)

- Optimises multiple variables - power generation, forecast market price and demand forecast
- Enables power price arbitrage and technical hedge against peak prices
- Enables load shifting, solar following and production schedule optimisation



2019 Finalist
Innovative Use of
Technology



AIRAH 2018
Winner
Excellence in Refrigeration



CNA 2017 Winner
Applied Innovation

Key Applications



Cold Storage

- CO₂ is ~20-40% more efficient than traditional refrigerants
- Greenhouse Warming Potential of only 1
- Patented “dew point” cooling drives up efficiency under hot & dry Australian conditions



Food Processing

- Heating (both in-process and clean-up)
- Heating & Cooling (HVAC)
- Refrigeration (Medium Temperature)
- Blast Chilling and freezer storage (Low Temperature)



Refrigeration

- Excellent performance for mixed loads (freezers, cool rooms, refrigerators and HVAC)
- Better safety, simplified plumbing and reduced space constraints vs NH₃
- Better sustainability credentials than HCFCs



HVAC: Greenfields or retrofit

- Reduced CAPEX and ~40% more efficient
- Eliminate water from occupied space
- Simplified design for reduced R &M
- Direct R22/R404A systems replacement



Renewables Optimisation / Zero Carbon

- Technology can maximise renewable use and returns
- Capturing spilled power as thermal energy for later reuse
- Capturing waste heat or cold and applying to applications later



2019 Finalist
Innovative Use of
Technology



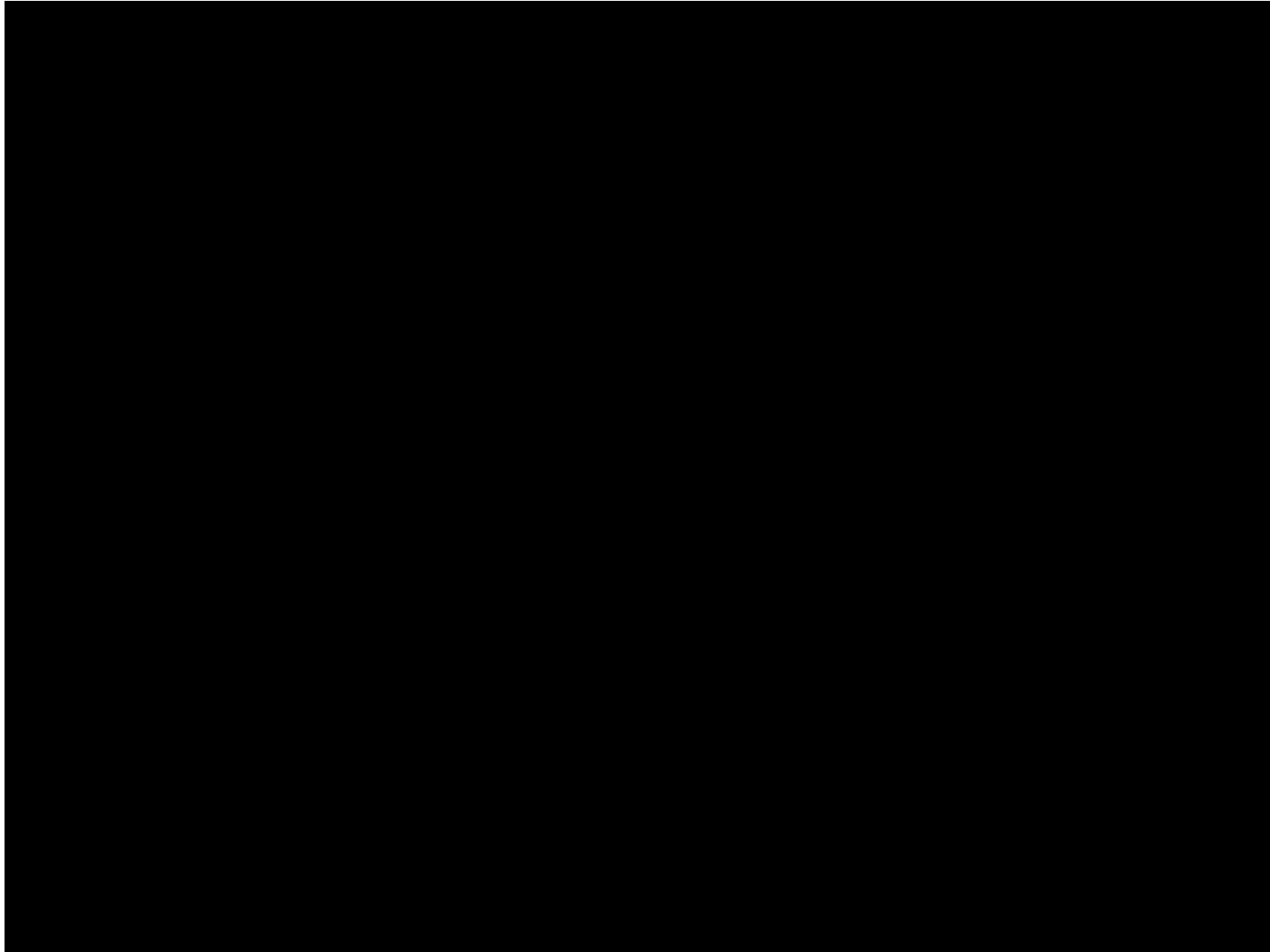
AIRAH 2018
Winner
Excellence in Refrigeration



CNA 2017 Winner
Applied Innovation

Energy management with Glaciem TES^{ACFA}

How do we build a PCM Thermal Energy Storage Tank?



The build of a 4MWh thermal energy storage tank at Glaciem's manufacturing partner's premises.

(click in the box and the play arrow)



2019 Finalist
*Innovative Use of
Technology*



AIRAH 2018
Winner
Excellence in Refrigeration



CNA 2017 Winner
Applied Innovation

Proven at scale in diverse sectors



Misty Downs Dairy

Refrigeration system (43kW) and 253kWh PCM for Dairy Industry; 48kW hot water used for sanitation

Indian partner on the project is Amul Dairy (5% market share of dairy industry world-wide)

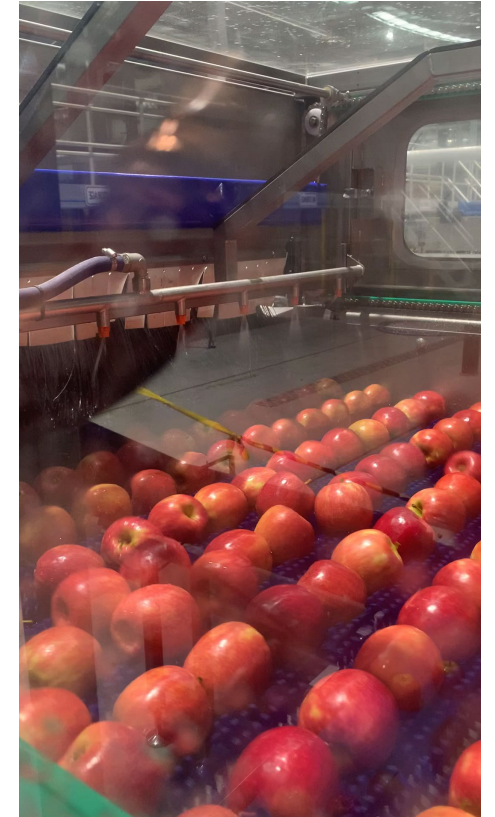


Montague Apple Orchards

Heat and Cooling system: Hot water for apple sanitation; 700 kW cooling and 1.1MW heating heat pump; Cold into 4MWh PCM Thermal Storage for refrigeration processes

Decarbonisation Effects

- Thermal storage to “fix” mismatch of heating & cooling times
- Gas boiler avoidance
- Maximising use of renewables



2019 Finalist
Winner
Innovative Use of
Technology



AIRAH 2018
Winner
Excellence in Refrigeration



CNA 2017 Winner
Applied Innovation

Proven at scale in diverse sectors



Decarbonisation Effects

- “Load shifting”
- Maximising use of renewables
- Avoiding spilled “behind the meter” generation
- Gas boiler replacement



Pernod Ricard, Rowlands Flat

CO₂ Heat Pump, PCM, PV and Smart Controls for Process Cooling

2.6 MWh (thermal) of storage, with 300kw of solar, fully integrated with existing on site SCADA systems

Integration of the TES PCM with existing onsite ammonia plant (1.4MW) with 400kW cooling / 718kW heating heat pump

Smart controls optimise of refrigeration processes considering future wholesale market prices and available **offsite renewable (wind and solar via a PPA)**

Reef HQ, Townsville

CO₂ Heat Pump, PCM, PV and Smart Controls for HVAC Application

PCM storage (1.2MWh thermal) stores spilled roof-top solar.

The building management system is integrated with the smart controls to maximise self consumption of solar.

The **gas boiler is also replaced** by the highly efficiency heat pump, providing both heating and cooling, powered by renewable energy



2019 Finalist
Innovative Use of
Technology



AIRAH 2018
Winner
Excellence in Refrigeration



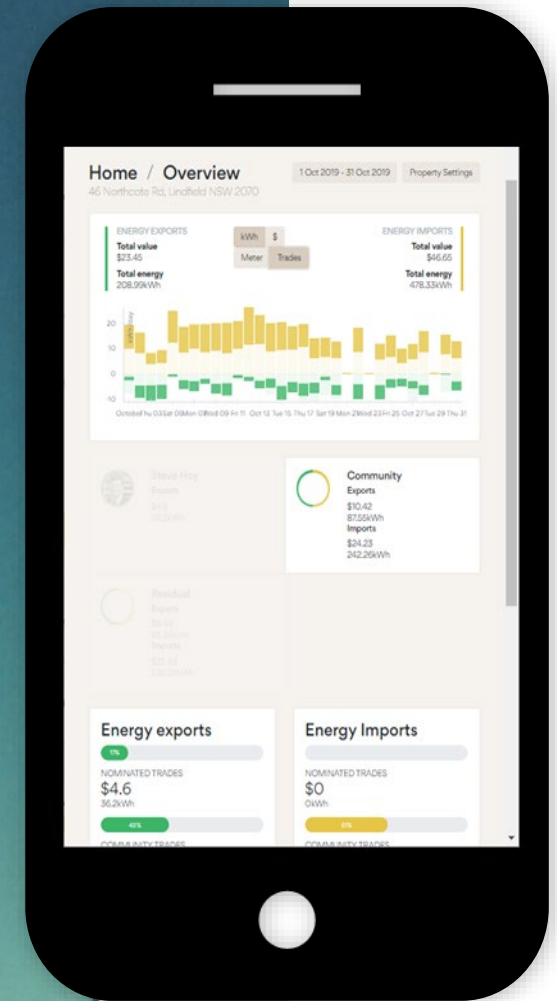
CNA 2017 Winner
Applied Innovation

* Pending any COVID-19 travel restrictions lifting

Introducing Enosi's Powertracer

The world's first grid-scale trading and tracing solution

Enables individuals and organisations to buy clean energy direct



Common Corporate Sustainability Drivers

- ✓ Trace and reduce scope 2 & scope 3 emissions
- ✓ Support staff working from home, incurring increased energy bills
- ✓ Support staff / customers wanting to take direct action around climate change
- ✓ Increase uptake of renewable energy among the business, staff, suppliers
- ✓ **Faster achievement of Net Zero**



24/7 Traceability will become the standard

- **Claiming to be 100% renewable with an un-linked wind or solar PPA isn't credible.**
When the wind isn't blowing or the sun isn't shining, your power is mostly dirty!
- **The bar has been raised from Net Zero to True Zero**
Google, IBM, Microsoft, Salesforce, IKEA and now the US Government, are leading the way
- opting to maximise their renewable energy 24/7
- Energy **Retailers will need to comply** with their wishes;
Traceability will become a standard
- Enosi is a member of the EnergyTag standards organisation, working to set the international standards for 24/7 energy traceability

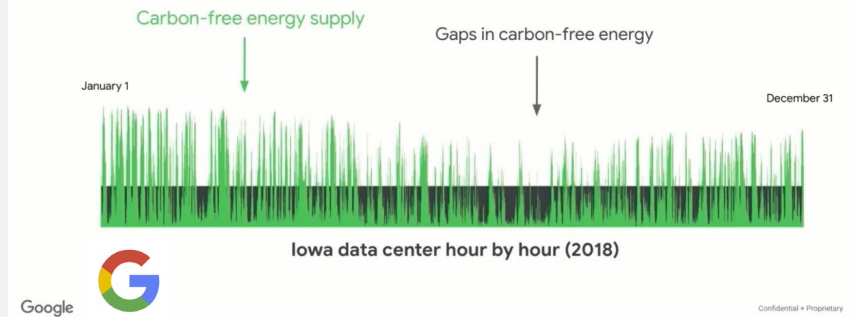


Set 100% renewable target for its global demand in real time without the use of offsets or certificates



...but 100% RE does not fundamentally solve the problem

Due to the variability associated with renewables, we still rely heavily on coal and gas from the grid during periods of low wind or solar



By 2022, achieve 100% Renewable Energy

Our long-term target is a 24/7 clean energy grid. In pursuit of this future, Salesforce set two inter- to address the climate impacts of our own electricity use. We reached our first target in 2017, [Net Greenhouse Gas Emissions](#), by procuring carbon offsets for the emissions associated with our e

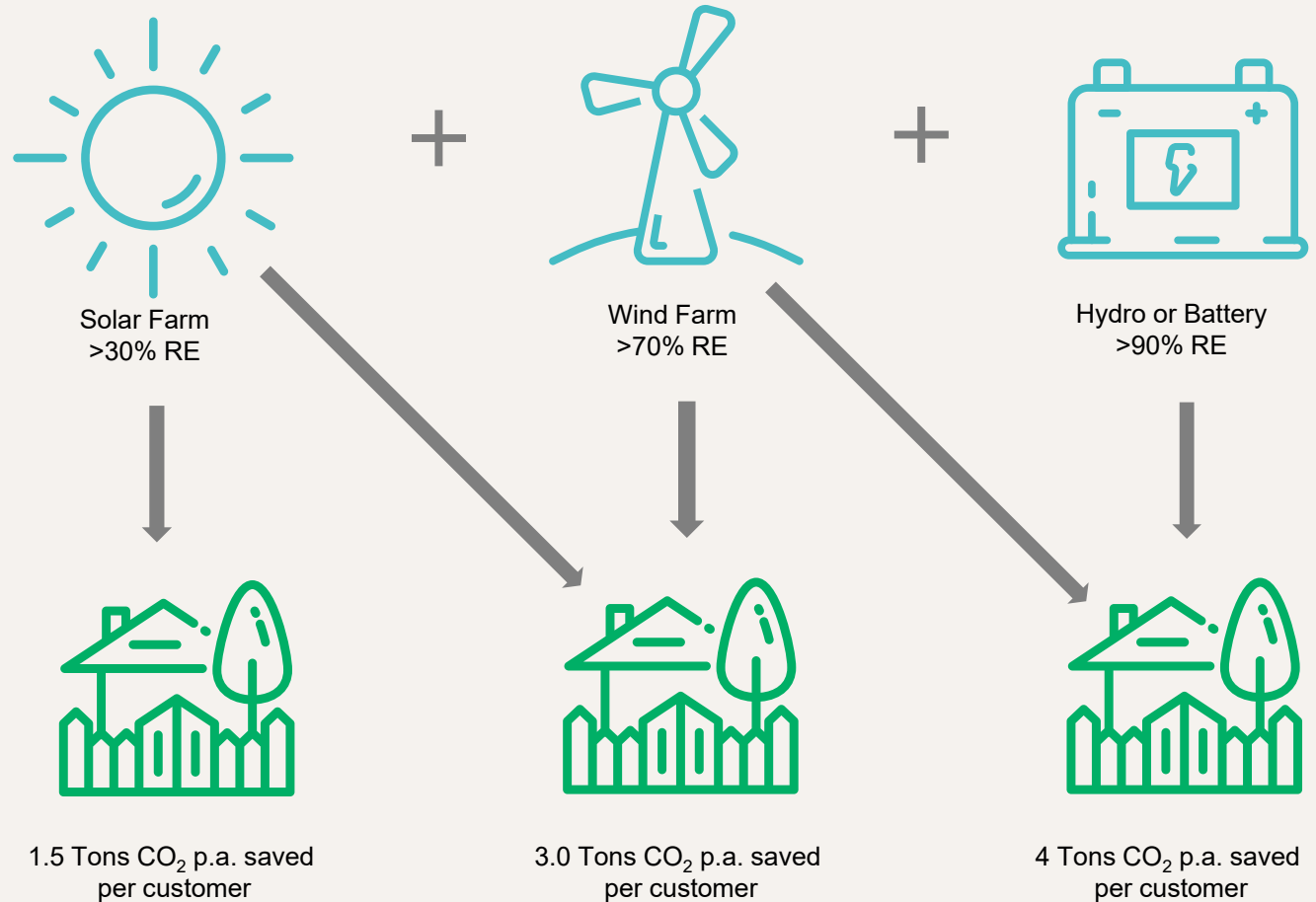
The American Jobs Plan March 2021:

(President Biden's plan) will use the federal government's incredible purchasing power to drive clean energy deployment across the market **by purchasing 24/7 clean power for federal buildings..**

Lowering our Carbon Footprint

Putting direct demand-side pressure on delivery of more renewables

% of Consumer energy usage matched to RE source



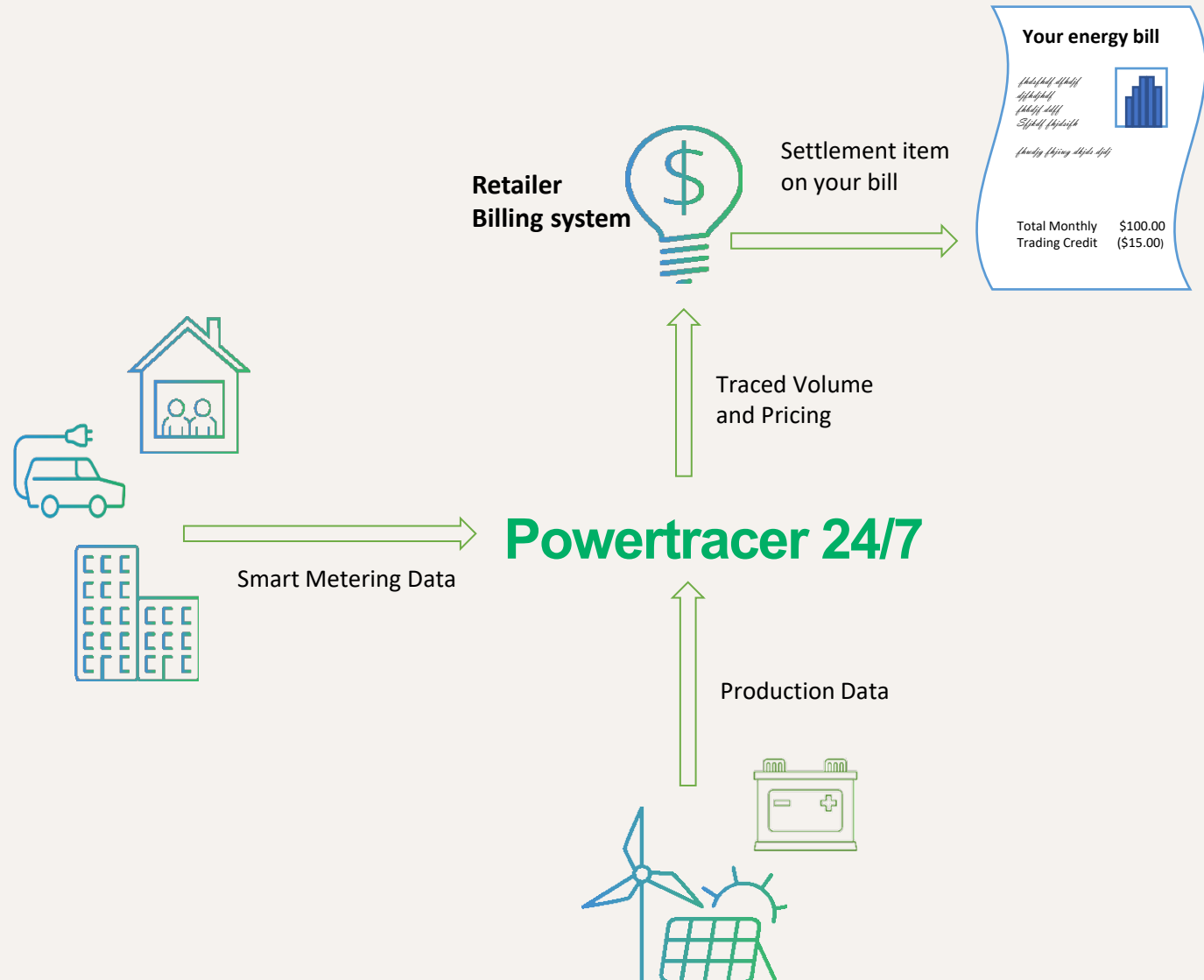
Results of sourcing from renewables
24/7, every 30 minutes

Powertracer integrates with Retailers to deliver Source, Time and Price of your energy

How it Works

Powertracer:

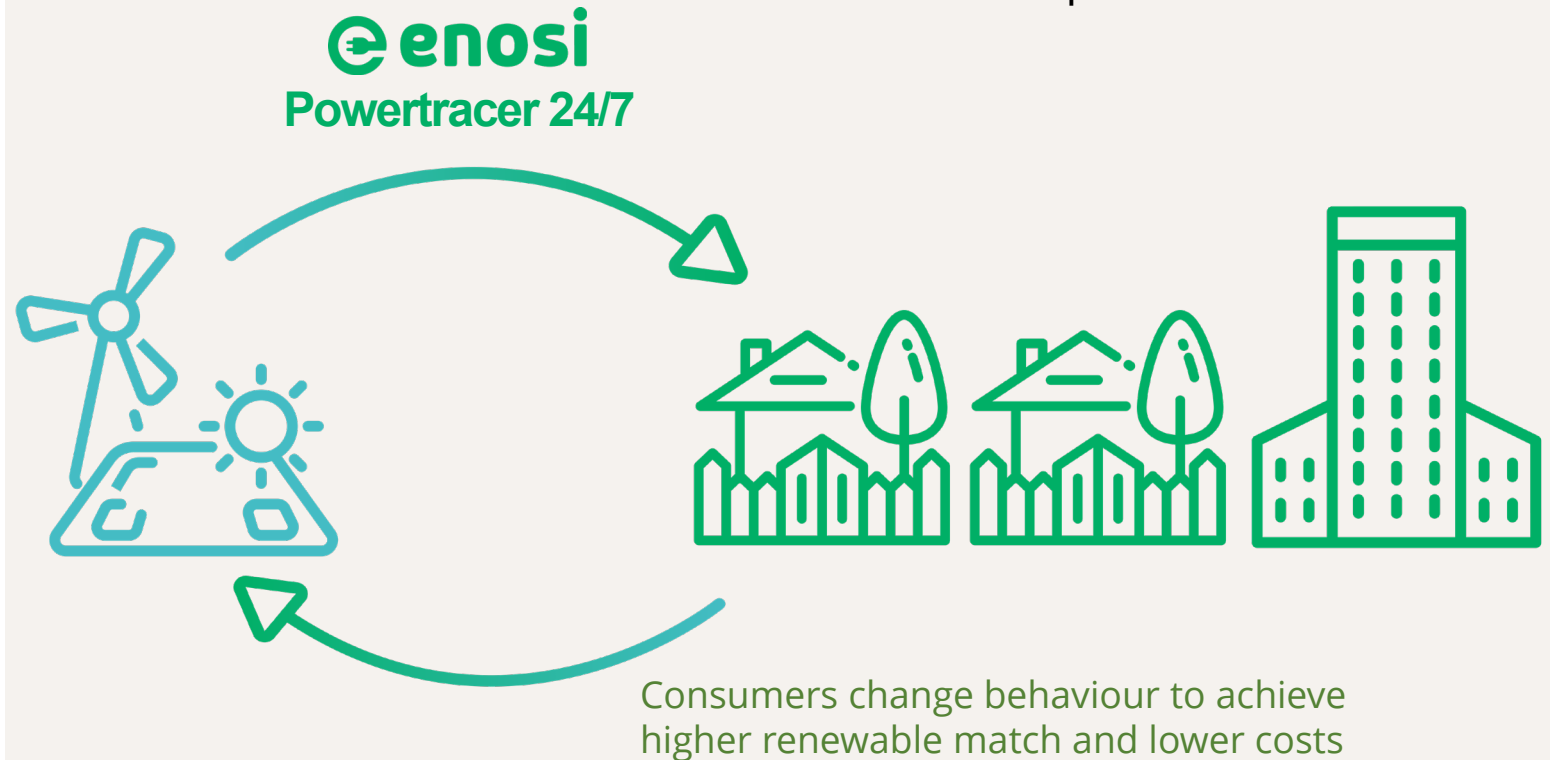
- Collects 30 min metering data from producers and users (via the Retailer)
- Uniquely matches consumption with production
- Applies agreed / contracted pricing to matched amounts
- Settles the trade on the Retail bill



Powertracer will drive behavior change at scale with notifications and DR integration.

- Powertracer provides the matching and pricing service
- Retailers create incentives against the matched renewable energy volume
- Electricity suppliers use Powertracer to shift consumer demand to match their energy production
- Consumers change behaviour to achieve higher renewable match and lower costs

Electricity suppliers use Powertracer to shift consumer demand to match their energy production.



Clean Energy Direct

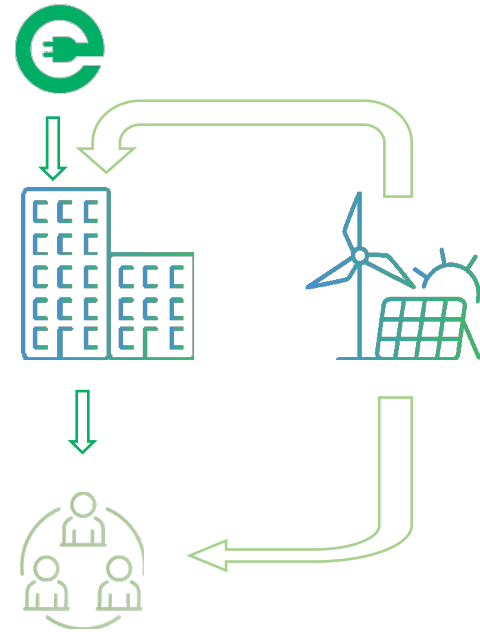
To your business, staff, customers, suppliers and your community

Corporate B2B2C

Empowers businesses & communities to extend clean energy offers to staff, customers etc

Enosi engages corporates and communities with participating Retailer(s)

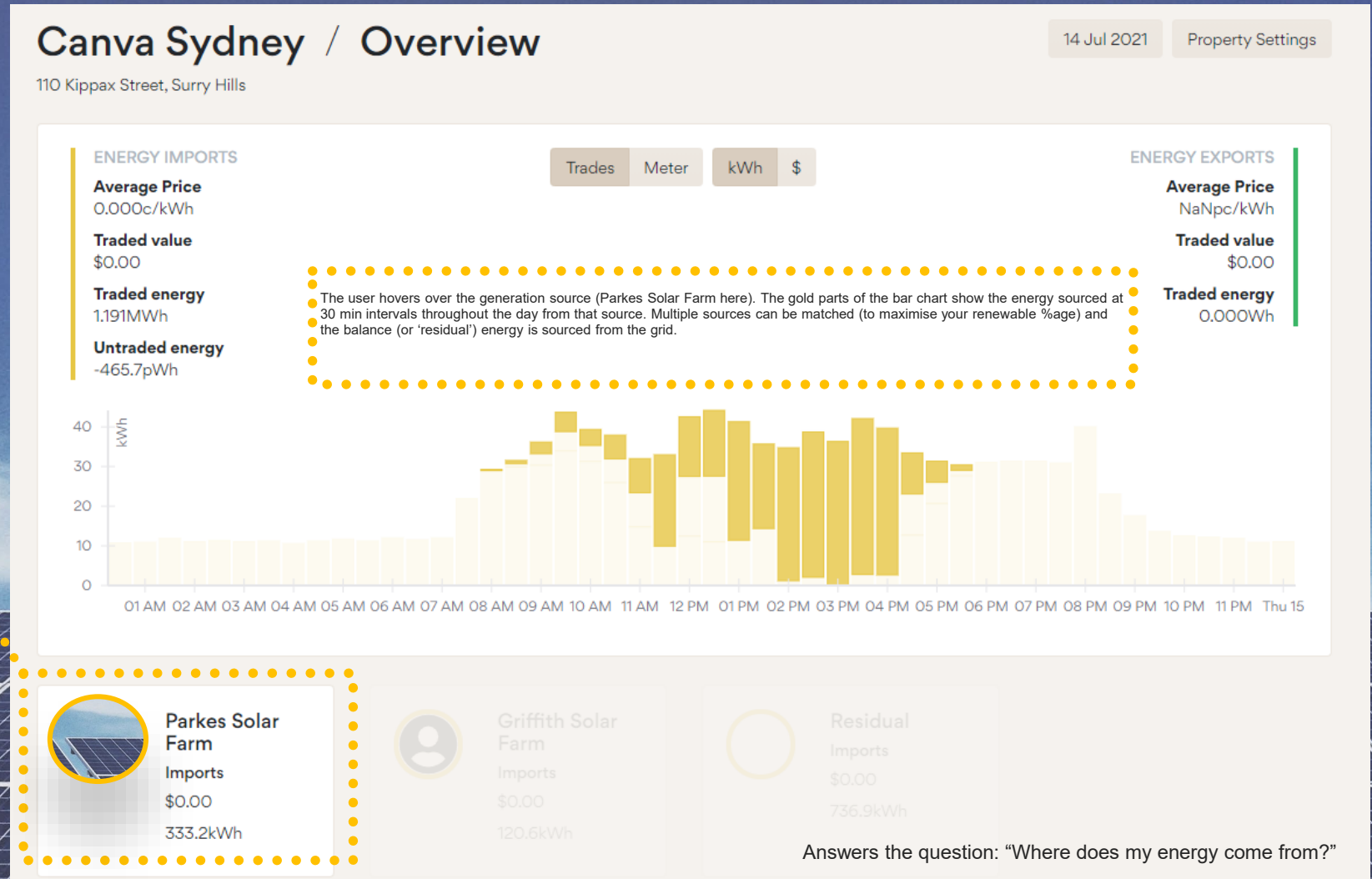
Business or community group extends to end consumers



That's my solar farm !

Customers can trace the source of their energy 24/7 which helps:

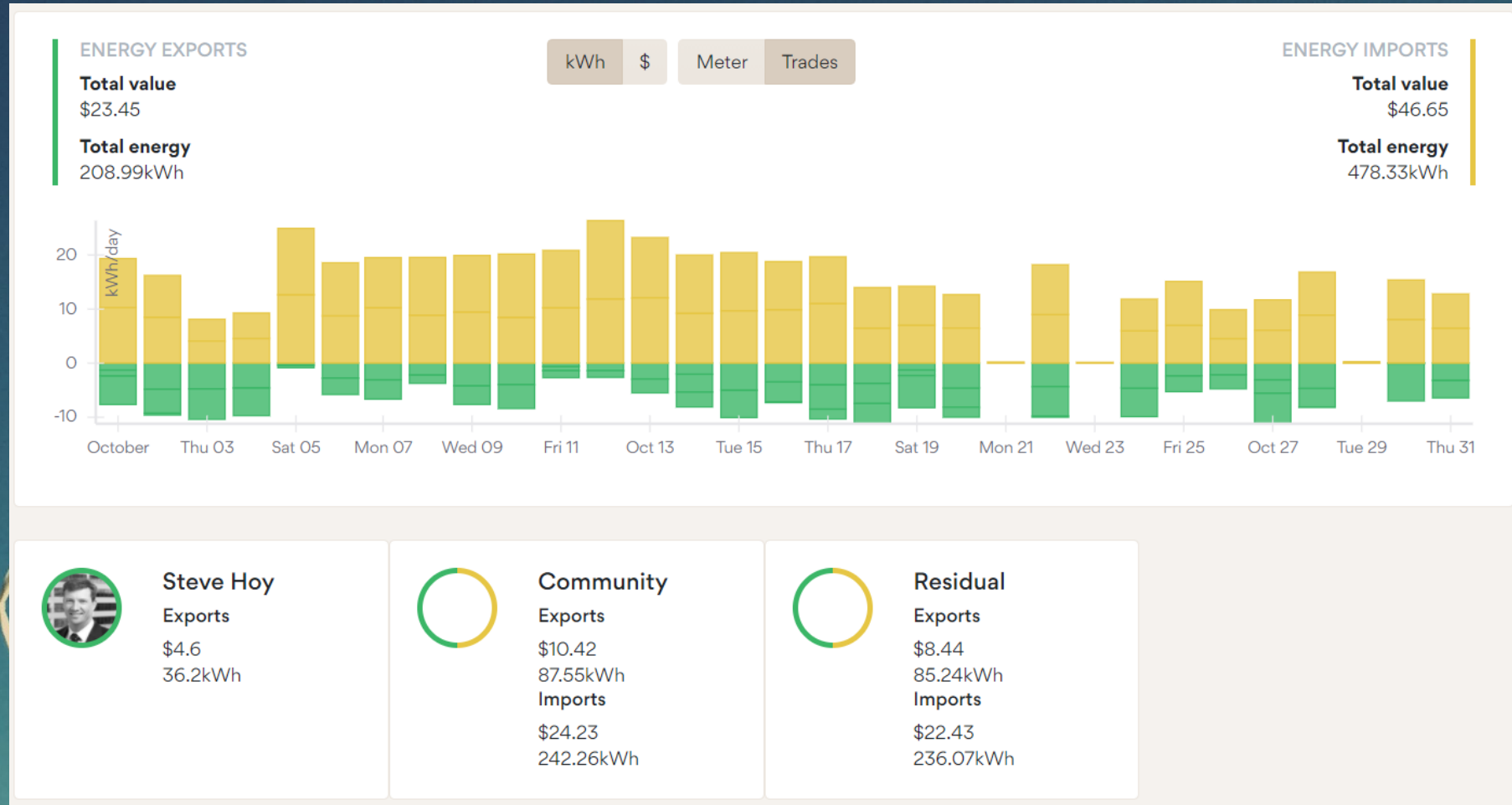
- Eliminate greenwashing
- Procure the right mix of renewables to match generation to demand
- Give confidence in their ability to take direct action.
- Change behavior at scale shifting load and driving renewable energy demand
- Potential gamification of clean energy use to drive even more impactful engagement



Sell your solar exports to staff, customers, family and friends!

See the source of your energy imports (gold on Powertracer)

If you have solar panels, you can see who you are exporting it to (green), and set your own price



Simply Energy live case study

Hunter Douglas

Powertracer is being used to share solar exports with staff on discounted rates

- ▶ Business earns good export rates
- ▶ Staff benefit with guaranteed 21% discount
- ▶ Additional ~25% discount when staff consumption matches solar exports
- ▶ Faster progress to net zero



Residential ▾

Business ▾

Why choose us ▾

[? Help centre](#)

[→ My account](#)

Benefits through the roof

Hunter Douglas Solar Sharing Plan

We've teamed up with your employer Hunter Douglas to offer you our Simply Choice energy plan, which gives you a guaranteed discount on your home electricity and gas.

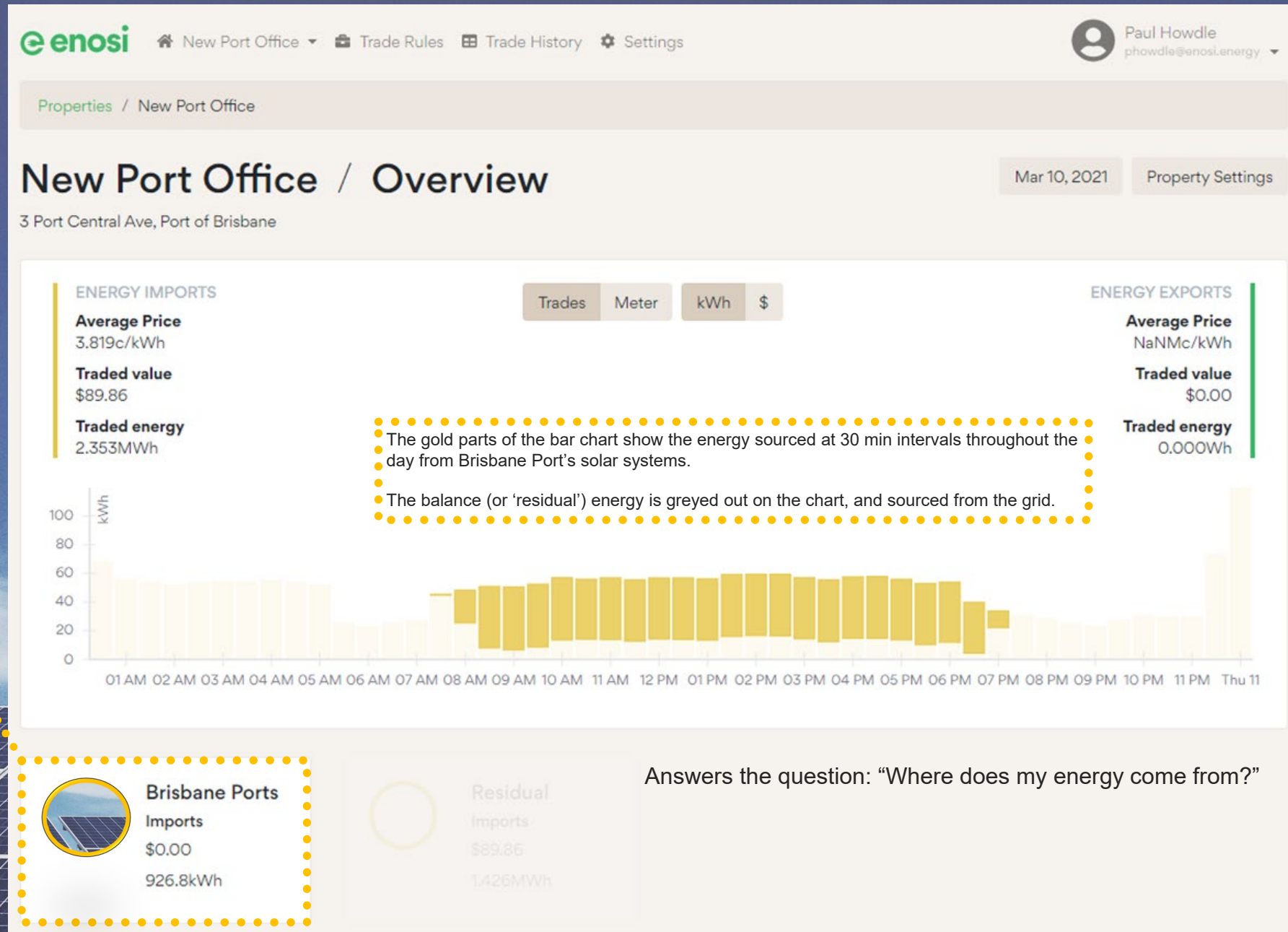
As an employee in NSW, you're also eligible to benefit from the Rydalmere warehouse's exported solar energy, through the Powertracer Solar Sharing Plan.

So, when the sun is shining and Hunter Douglas is exporting solar energy, Simply Choice gives employees the chance to benefit from the exported solar energy at a discounted rate as explained below in the FAQs.

That's our solar energy

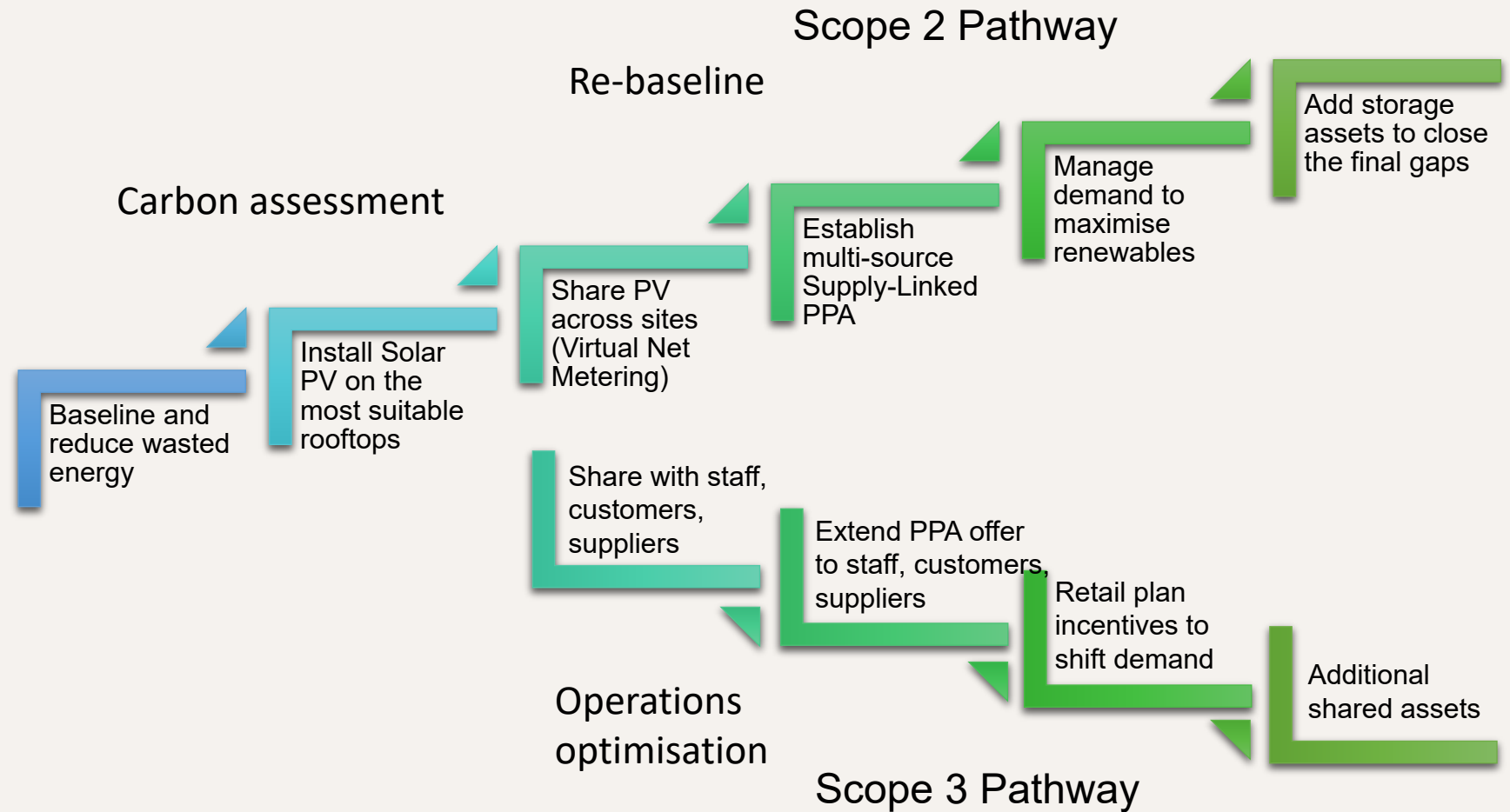
Customers can trace the source of their energy 24/7 which helps:

- Eliminate greenwashing
- Procure the right mix of renewables to match generation to demand
- Give confidence in their ability to take direct action.



Business Path to True Zero Carbon Energy

Enosi
Powertracer





e enosi

Contact:

Paul Howdle

0411 693 950

phowdle@enosi.energy

www.enosi.energy

Q&A's

Breakout session

Thank you

RACE for
2030
RELIABLE
AFFORDABLE
CLEAN
ENERGY



Australian Government
Department of Industry, Science,
Energy and Resources

AusIndustry
Cooperative Research
Centres Program