Blueprint
Uralla Case Study
SO IF URALLA WANTS TO TAKE ACTION TO BECOME A ZNET...

WHAT CAN CONTRIBUTE TO ZERO NET ENERGY

1. USING LESS
   ENERGY AT HOME
   AND AT WORK

2. GENERATING
   ENERGY
   ON-SITE

3. RESTORATION &
   REFORESTATION
   NEARBY

4. GENERATING
   ENERGY
   NEARBY

5. IMPORTING SUSTAINABLE
   FIRE WOOD

6. IMPORTING RENEWABLE
   ENERGY
The Z-NET Blueprint

The Z-NET Blueprint sets out a simple logic for communities across Australia to establish a least cost approach to investing in renewable energy. To establish a business case for action the community needs to weigh up the benefits with the costs and compare this to other possible actions.

The Blueprint ensures that actions that have the most benefits or least cost are taken first. The Blueprint also recognises that both benefits and costs of renewable energy options change over time. The approach allows a community to take practical action immediately and resolve a framework to consider future investment to meet the Z-NET goal.
**Generate Renewable Energy On-Site**

**Generate Renewable Energy Nearby**

**Import Renovable Energy**

**To get to 100% Net:**

- Compare the overall cost of renewable energy generated nearby at a commercial scale with the cost of green power.

**Value of Energy Generated**

**Cost of Action**

**Net Benefit**

Invest in on-site generation like solar panels when the value of energy generated outweighs the cost of buying regular energy.

**Least Cost**

To get to 100% ZNET: Compare the overall cost of renewable energy generated nearby at a commercial scale with the cost of green power.
## Summary of electricity option evaluation

<table>
<thead>
<tr>
<th>Options</th>
<th>Impact (% ZNET)</th>
<th>Business Case</th>
<th>Technical</th>
<th>Regulatory</th>
<th>Managing risk</th>
<th>Customer market</th>
<th>Enviro benefit</th>
<th>Social benefit</th>
<th>Economic benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using less – Hot water</td>
<td>3.1</td>
<td>✓ ✓</td>
<td>✓ ✓</td>
<td>✓ ✓</td>
<td>✓ ✓</td>
<td>✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓</td>
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</tr>
<tr>
<td>Using less – Lighting</td>
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<td>✓ ✓ ✓</td>
<td>✓ ✓ ✓</td>
<td>✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓</td>
</tr>
<tr>
<td>Using less – Appliances</td>
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<td>✓ ✓ ✓</td>
<td>✓ ✓ ✓</td>
<td>✓ ✓ ✓</td>
<td>✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓</td>
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</tr>
<tr>
<td>Using less – Business energy efficiency</td>
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<td>✓ ✓ ✓</td>
<td>✓ ✓ ✓</td>
<td>✓ ✓ ✓</td>
<td>✓ ✓ ✓</td>
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</tr>
<tr>
<td>Generating on-site – Residential and business solar PV</td>
<td>12.6</td>
<td>✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓</td>
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<td>✓ ✓ ✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓ ✓ ✓</td>
</tr>
<tr>
<td>Generating nearby – Utility scale electricity generation</td>
<td>?</td>
<td>✓ x</td>
<td>✓ ✓ x</td>
<td>✓ ✓ x</td>
<td>✓ ✓ x</td>
<td>✓ ✓ ✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓ x</td>
<td></td>
</tr>
<tr>
<td>Importing renewable energy (GreenPower)</td>
<td>?</td>
<td>✓ ✓ ✓</td>
<td>✓ ✓ ✓</td>
<td>✓ ✓ ✓</td>
<td>✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓</td>
</tr>
</tbody>
</table>

### Reading a cost curve

1. Each scenario represents a scenario that contributes to a ZNET.

   - The height and position of a block either below or above the x-axis shows the cost or each % of getting to ZNET.
   - The width of a block shows the how much the scenario can contribute to a ZNET.

2. The difference between 'costly' and beneficial options

   - **Beneficial scenarios**: All of these scenarios are expected to be financial benefits. They save you money once you take into account all of the costs and benefits over its lifetime. Visually they have a "negative levelised cost" and are positioned below the x-axis.
   - **Costly scenarios**: These scenarios are expected to be financially costly. All things considered financially at least it is expected that their costs will outweigh their benefits over the life of the scenario. Visually they have a "positive levelised cost" and are positioned above the x-axis.

3. The blocks 'build' left to right towards achieving the ZNET target.
TOWARDS Z-NET: CLEAN ELECTRICITY COST CURVE

Comparing scenarios in terms of cost of energy and contribution to getting to... 50%

And up to 100% or more of clean electricity in Uralla

- Solar PV (Residential): -10 c/kWh
- Solar PV (Business): -9.5 c/kWh
- Solar PV (Business): -9.2 c/kWh
- Solar PV (Business): -18 c/kWh
- Solar PV (Residential): -10 c/kWh
- Energy Efficiency (Residential): -6 c/kWh
- Energy Efficiency (Business): -5 c/kWh
- Domestic Hot Water (Residential): -2.4 c/kWh
- Space Conditioning (Residential): -8.5 c/kWh
- Space Conditioning (Business): -8.3 c/kWh
- Appliances (Residential): -9.5 c/kWh
- Appliances (Business): -9.5 c/kWh
- Lighting (Residential): -8 c/kWh
- Lighting (Business): -8.5 c/kWh
- Thermal Fabric (Residential): -2 c/kWh
- Thermal Fabric (Business): -2 c/kWh
- GreenPower Program (Residential & Business): +4.0 c/kWh
- Biomass: Up to +21 c/kWh
- Utility Solar: Up to +21 c/kWh
- Wind: Up to +11 c/kWh
- GreenPower Program (Residential): +4.0 c/kWh
- GreenPower Program (Business): +4.0 c/kWh

Contribution to the electricity component of Z-net Uralla
Summary of wood option evaluation

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</tr>
</thead>
<tbody>
<tr>
<td>Using less – Thermal comfort</td>
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<td>✓ ✓ ✓</td>
<td>✓ ✓ ✓</td>
<td>✓ ✓ ✓</td>
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<td>✓ ✓ ✓</td>
<td>✓ ✓ ✓</td>
<td>✓ ✓ ✓</td>
</tr>
<tr>
<td>Generating nearby – Woodland restoration and reforestation</td>
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<td>✓ ✓ ✓</td>
<td>✓ ✓ ✓</td>
<td>✓ ✓ ✓</td>
<td>✓ ✓ ✓</td>
<td>✓ ✓ ✓</td>
<td>✓ ✓ ✓</td>
<td>✓ ✓ ✓</td>
</tr>
<tr>
<td>Importing energy – Purchase of a third party certified firewood supply</td>
<td>?</td>
<td>✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓</td>
<td>✓ ✓ x</td>
</tr>
</tbody>
</table>

Comparing scenarios in terms of cost of energy and contribution to getting to... 14% 30%

Towards Z-Net: Sustainable Wood Cost Curve

Certified Wood $8.13 per GJ

Restoration of existing forests $8.13 per GJ

Reforestation of local wood $8.13 per GJ

CONTRIBUTION TO THE WOOD COMPONENT OF ZNET URALLA
Stage 1 roadmap

ELECTRICITY

ENERGY EFFICIENCY

- Measures for business energy efficiency
- Residential
  - Lighting
  - Appliance
  - Hot water
  - Heating and Cooling

- Thermal fabric (insulation)

GAS

WOOD

Energy efficiency & fuel switch to electricity

RESIDENTIAL & BUSINESS SOLAR PV

- GETS Uralla to about 70% of the way to being a ZNET

PURCHASE RENEWABLE ELECTRICITY

- USING LESS

GENERATE ON-SITE

IMPORT

- REDUCING

RESTORATION & REFORESTATION

PURCHASE SUSTAINABLY CERTIFIED WOOD

IMPORT

GENERATE ON-SITE
Stage 2 roadmap

**Import**

- Purchase renewable electricity

**Generate nearby**

- Wind turbines
- Utility scale solar
- Community scale (with battery storage)
- Commercial scale

**Generate**

- Save, offset and/or generate enough total (net) energy to power Uralla
- Save and generate renewable energy to power Uralla at any time of the day
- Save and generate enough energy to power Uralla and nearby regions

**Energy Sources**

- Electricity
- Gas
- Wood

**Stage 2 roadmap**
Z-NET Uralla Enablers

- Council leadership
- Program funding
- Local solutions availability and knowledge
- Monitoring and evaluation
- Communications Planning
- Partnerships
- ZNET Uralla Reference Group (ZURG)
- Technical support and independent coordination
URALLA'S ENERGY CONSUMPTION IS REDUCED AND SOURCED ONLY FROM RENEWABLES

What energy consumption might look like after stage 1

We move toward Z-NET by reducing energy consumed (the width) and reducing non-renewable energy (the striped sections).

15.7% of total energy would be saved through energy efficiency.

154,400 GJ of energy is estimated to be used by Uralla Shire each year.

A mix of restoration and reforestation of woodlands have balanced the local supply.

MORE ENERGY EFFICIENCY WILL REDUCE ENERGY CONSUMPTION EVEN FURTHER. HOWEVER URALLA WILL NEED TO EITHER IMPORT SOME CLEAN ELECTRICITY AND GAS, OR GENERATE MORE CLEAN ENERGY ON-SITE OR NEARBY TO GET TO BECOME A Z-NET.

What energy consumption might look like after stage 2

Uralla’s energy consumption is reduced and sourced only from renewables.

183,000 GJ of energy is estimated to be used by Uralla Shire each year.

Just 3% of energy is already renewable coming from solar PV and GreenPower.

This means that all of the striped area in these bars needs to be reduced for Uralla to become a Z-NET