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Blueprint

Uralla Case Study

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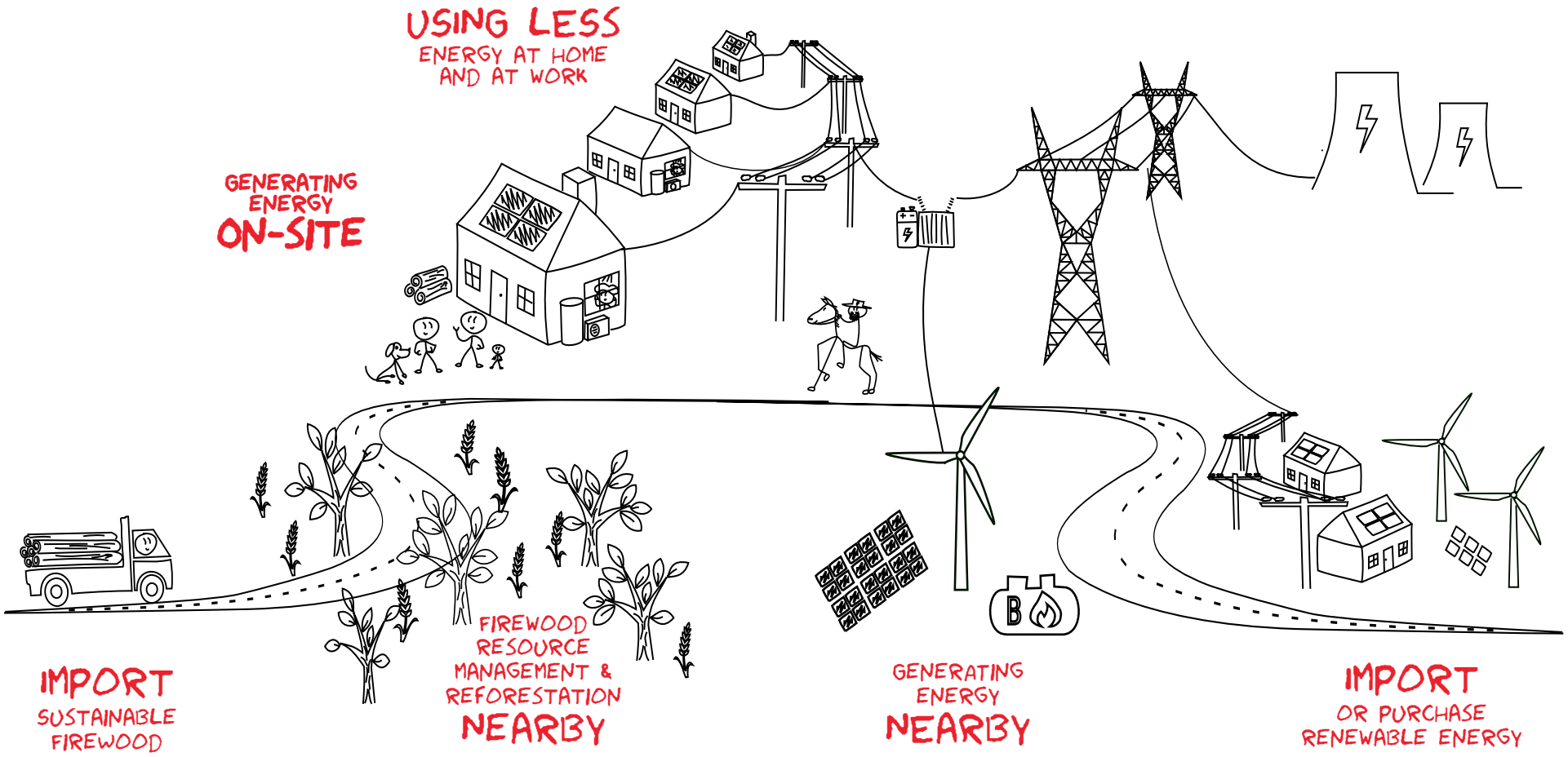
WHAT CAN CONTRIBUTE TO ZERO NET ENERGY



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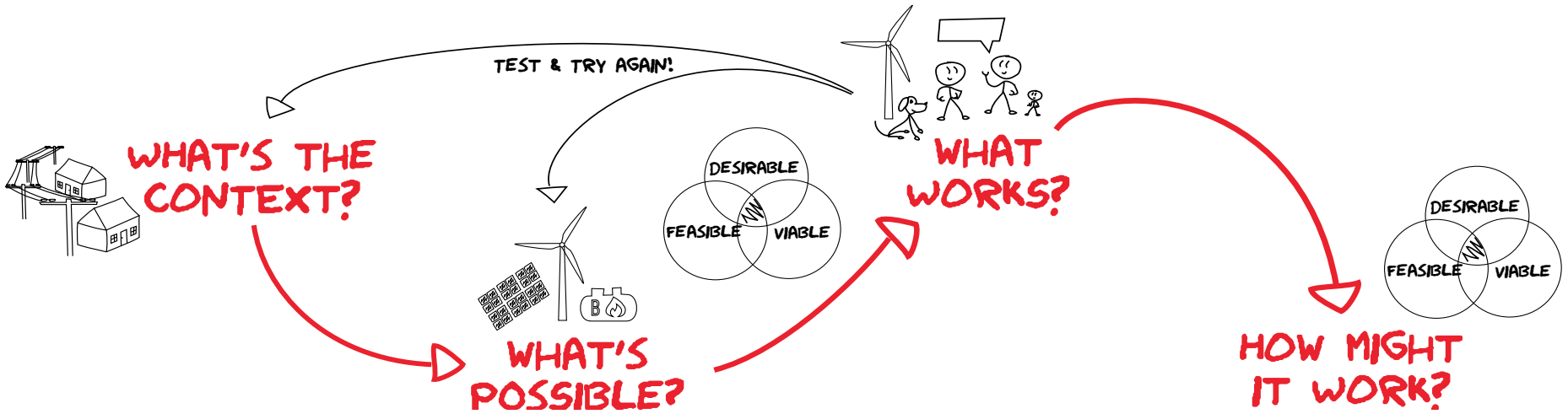

What's the context?

The first step is to understand the context, which includes identifying the characteristics of the location and the community and its existing energy use. The context defines current and future energy requirements, identifies opportunities and highlights issues that present limitations or risks.

What's possible and will it work?

The next step is to understand all the possible options and determine the best fit within the local context. There are many options to reduce energy use and produce energy from renewable sources. To find the right approach we need to identify if options are feasible, viable and desirable.

How it might work?

Having a model is great but it's crucial to have a plan to ensure it gets done. Understanding who is responsible for what and being clear about the resource requirements are key to ensuring we have a practical and reasonable path to achieve the goal of becoming a Z-NET.

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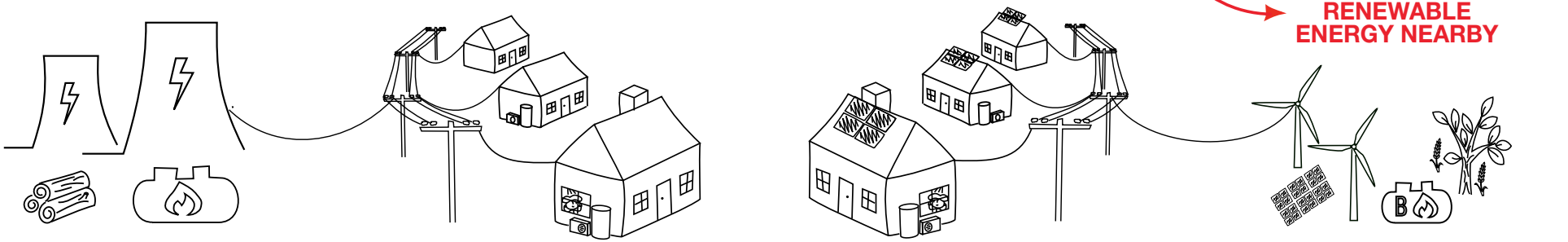
Z-NET BLUEPRINT

Z-NET ACTIONS: A LEAST-COST APPROACH

CURRENT NON-RENEWABLE ENERGY USE → USE LESS ENERGY → GENERATE RENEWABLE ENERGY ON-SITE → IMPORT RENEWABLE ENERGY (GreenPower) / GENERATE RENEWABLE ENERGY NEARBY



THE BUSINESS CASE

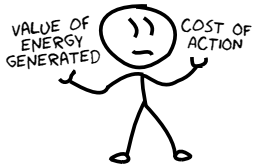
FOR ANY ACTION, COMPARE ALL THE UPFRONT COSTS AND ALL OF THE BENEFITS FROM NOT HAVING TO BUY NON-RENEWABLE ENERGY. IT MAKES SENSE TO TAKE ACTIONS THAT HAVE THE MOST BENEFITS OR LEAST COST FIRST.

NET BENEFIT

INVEST IN ENERGY EFFICIENCY MEASURES IF THE VALUE OF ENERGY SAVINGS OUTWEIGHS THE COST OF IMPLEMENTING THE 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% Z-NET: COMPARE THE OVERALL COST OF RENEWABLE ENERGY GENERATED NEARBY AT A COMMERCIAL SCALE WITH THE COST OF GREEN POWER.

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The **Z-NET BLUEPRINT** option assessment

The following is an overview of the assessment approach applied to each of the possible options to achieve zero net energy, such as energy efficient appliances, solar PV and improved firewood resource management.

What's possible?

Each option has characteristics that determine whether it will suit a local context and contribute to the Z-NET goal.

The technology or resource

» What is the technology or resource and what are its characteristics?

The local context

» What is the local context that the option responds to?

The impact

» What impact on the goal of zero net energy can this option have?

Will it work?

A number of factors need to be considered in order to evaluate technology and resource options.

Risk

» What are the risks associated with the option?

Social benefit

» What are the social benefits of the option?

Regulatory

» What are the regulatory opportunities and constraints?

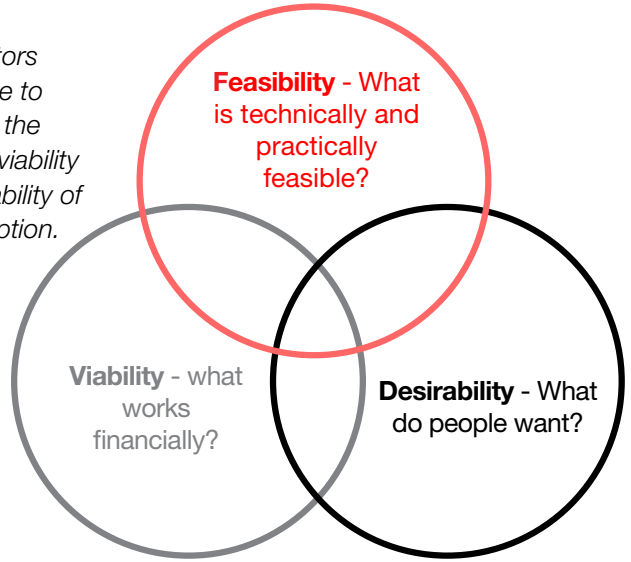
Technical

» What are the technical considerations for this option?

Economic benefit

» What are the additional economic benefits of the option?

These factors all combine to determine the feasibility, viability and desirability of any one option.



Business case

» What is the financial business case for the option?

Customer market

» What is the size of the customer market that the option would service?

Environmental benefit

» What are the environmental benefits of the option?

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Summary of electricity option evaluation

Options	Impact (% Electricity)	Business Case	Technical	Regulatory	Managing risk	Customer market	Enviro benefit	Social benefit	Economic benefit
Using less energy – Hot water	6.6	✓✓	✓✓	✓✓	✓✓	✓✓✓	✓✓	✓✓	✓
Using less energy – Lighting	4.7	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓	✓✓	✓✓	✓
Using less energy – Appliances	6.5	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓	✓✓	✓✓	✓
Using less energy – Business energy efficiency	2.0	✓✓✓	✓✓	✓✓✓	✓✓✓	✓	✓✓	✓✓	✓
Generating on-site – Residential and business solar PV	26.9	✓✓✓	✓✓✓	✓✓	✓✓	✓✓✓	✓✓✓	✓✓	✓
Generating nearby – Utility-scale electricity generation	?	✗	✓	✓	✗	✓	✓✓✓	✓	✗
Importing renewable energy (GreenPower)	?	✓	✓✓✓	✓✓	✓✓✓	✓	✓✓✓	✓	✗

Summary of wood option evaluation

Options	Impact (% wood)	Business Case	Technical	Regulatory	Managing risk	Customer market	Enviro benefit	Social benefit	Economic benefit
Using less energy – Thermal comfort	14.0	✓✓	✓✓	✓✓✓	✓✓	✓✓	✓	✓✓✓	✓
Generating nearby – Improved firewood resource management and reforestation	80.0	✓	✓✓	✓✓	✓	✓	✓✓✓	✓✓	✓
Importing energy – Purchase of a third party certified firewood supply	?	✓	✓✓✓	✓✓✓	✓	✓	✓✓	✓	✗

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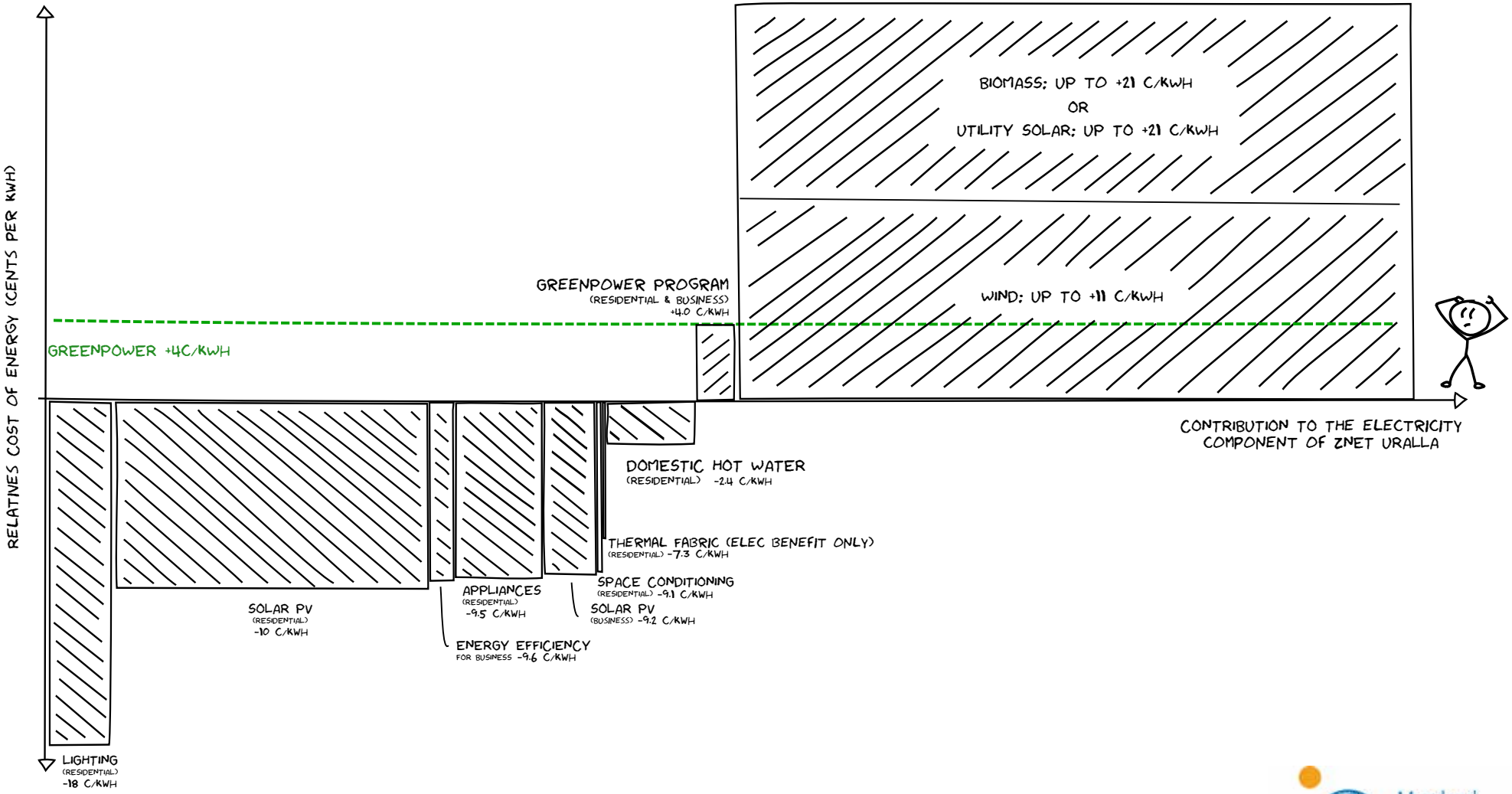
TOWARDS Z-NET: ELECTRICITY COST CURVE

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



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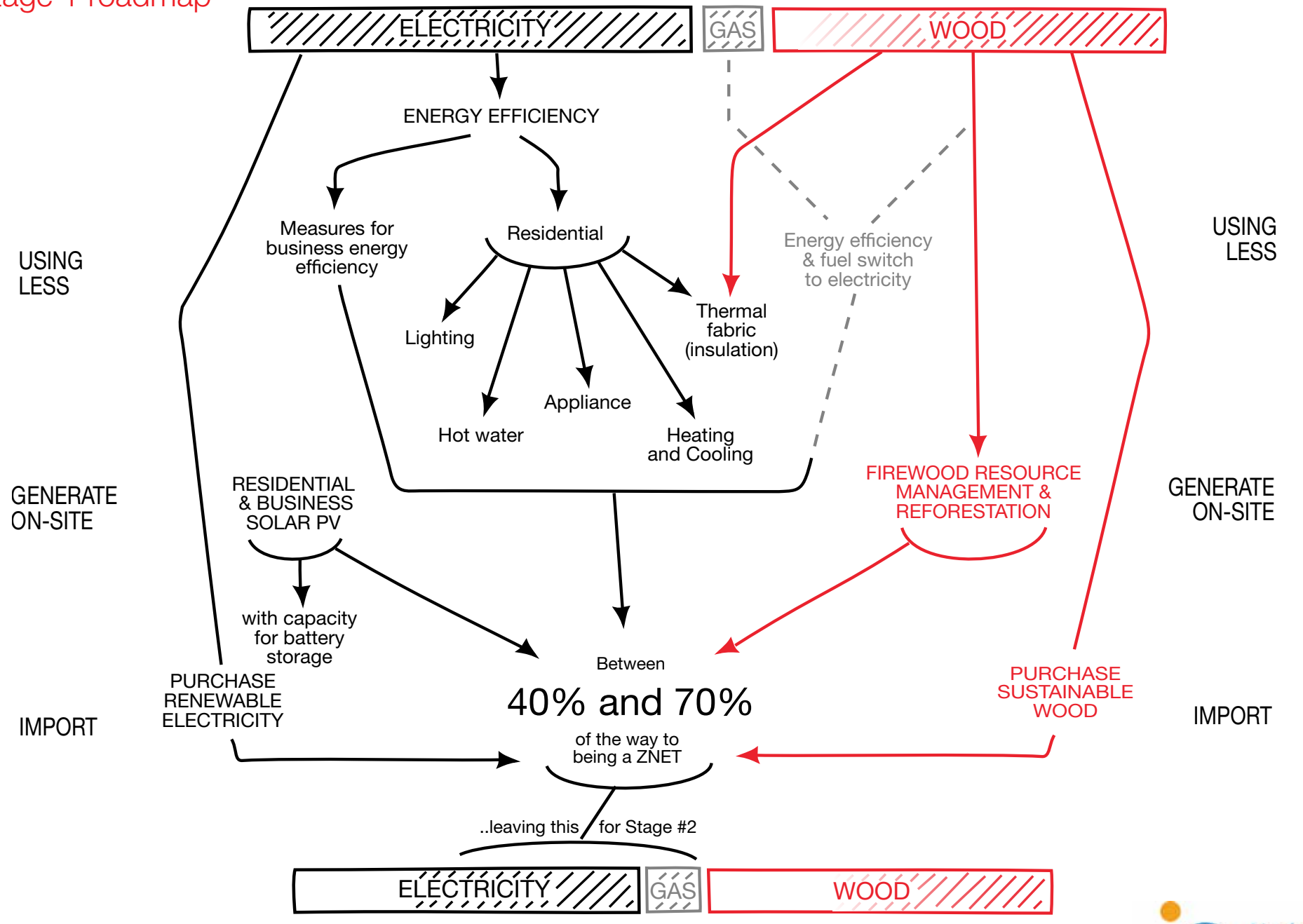
Stage 1 roadmap



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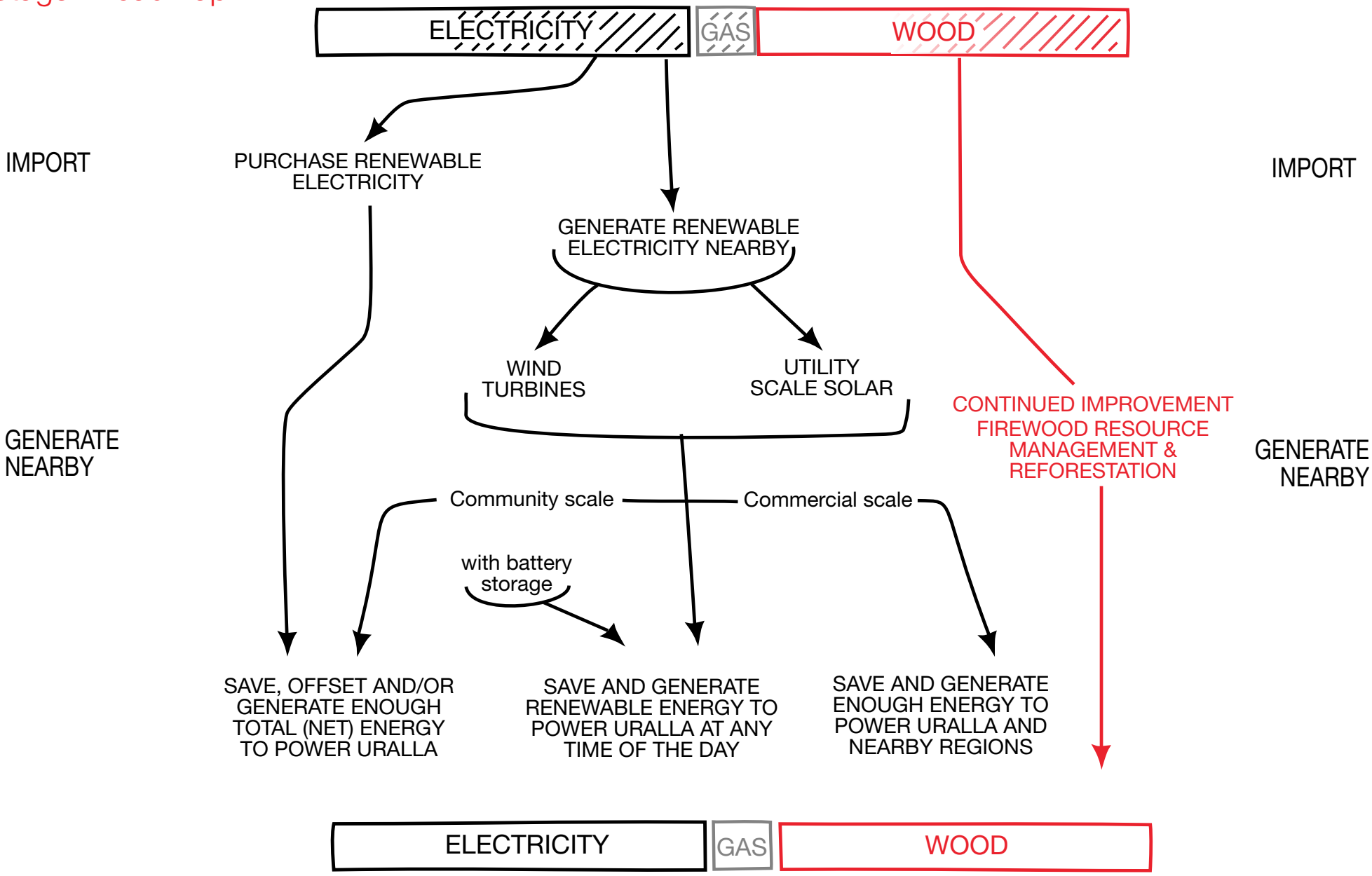
Stage 2 roadmap



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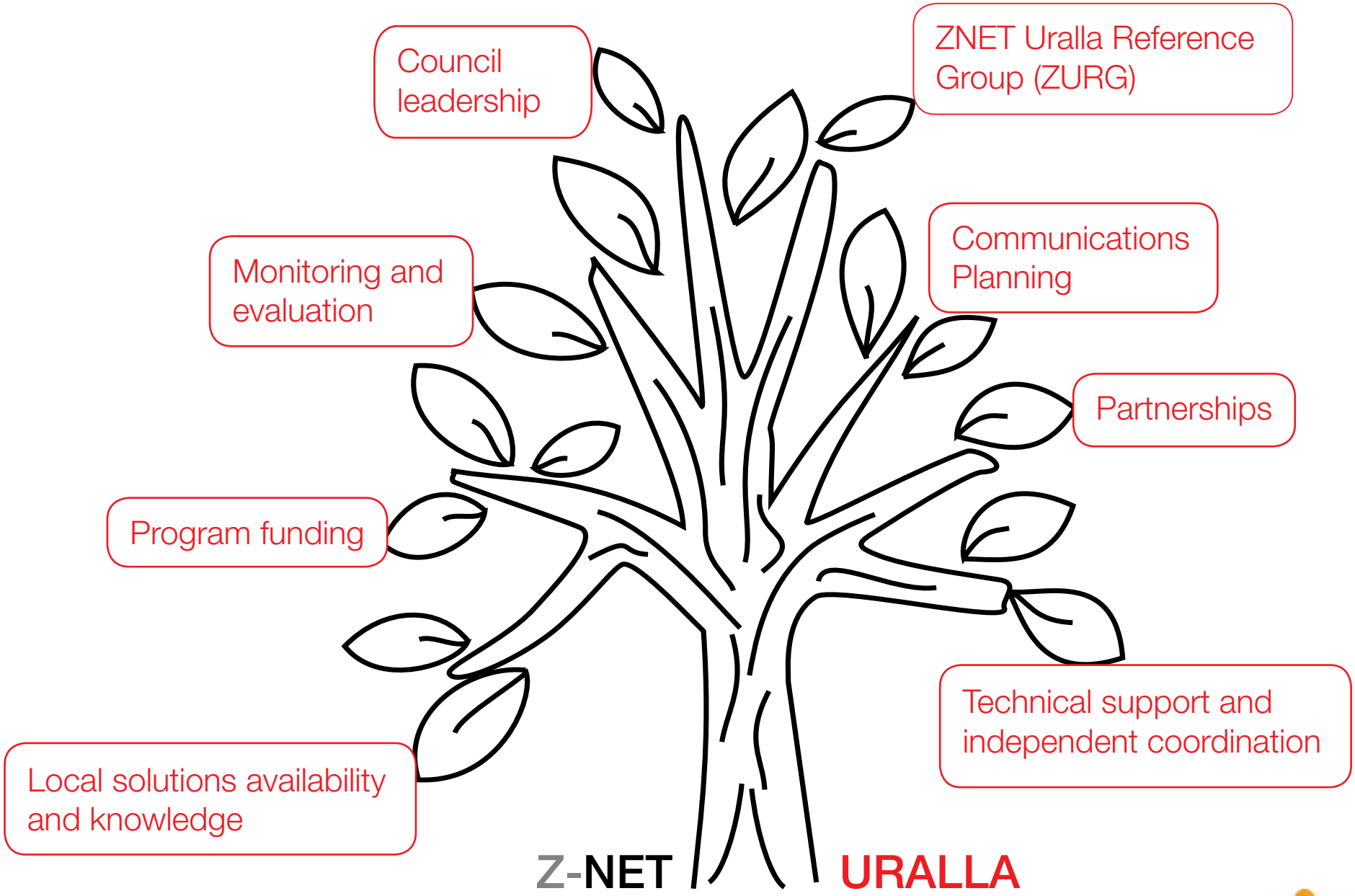
Z-NET Enablers



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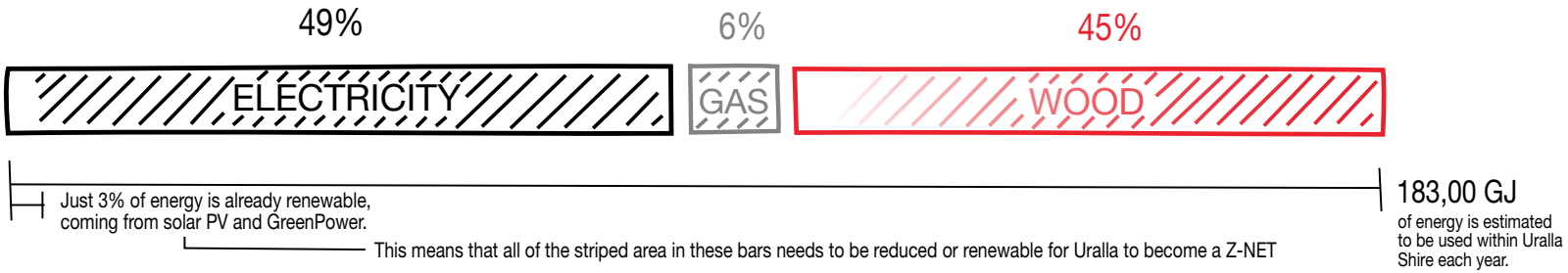
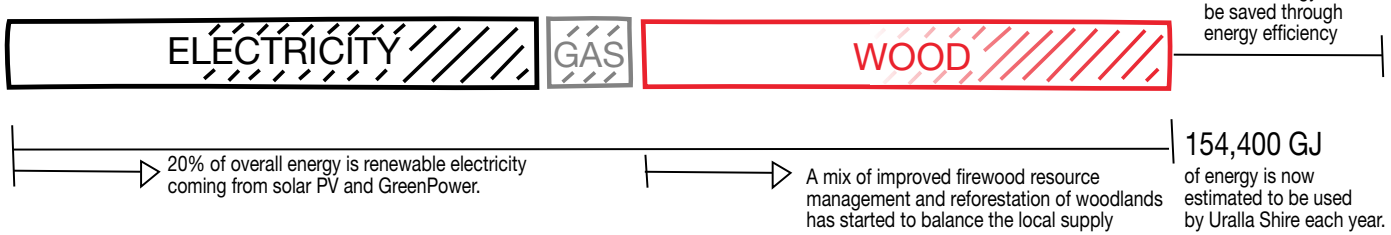
ENERGY CONSUMPTION IN URALLA TODAY



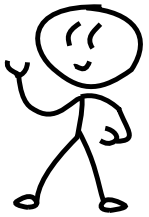
WHAT ENERGY CONSUMPTION MIGHT LOOK LIKE AFTER STAGE #1

WE MOVE TOWARD Z-NET BY REDUCING ENERGY CONSUMED (THE WIDTH) AND REDUCING NON-RENEWABLE ENERGY (THE STRIPED SECTIONS)



WHAT ENERGY CONSUMPTION MIGHT LOOK LIKE AFTER STAGE #2

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 BECOME A Z-NET.



URALLA'S ENERGY CONSUMPTION IS REDUCED AND SOURCED ONLY FROM RENEWABLE SOURCES

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Thank you and questions

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