COMMUNITY ENERGY CONGRESS

MELBOURNE 2017

MOUNT ALEXANDER SUSTAINABILITY GROUP INC

Going Deep: Delivering 100% Local Renewables

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FIRST THERE WAS ….

MOUNT ALEXANDER SUSTAINABILITY GROUP INC

THEN

Mount Alexander COMMUNITY WIND
Our power. our future

macR Mount Alexander COMMUNITY RENEWABLES

MASG COMMUNITY RENEWABLES

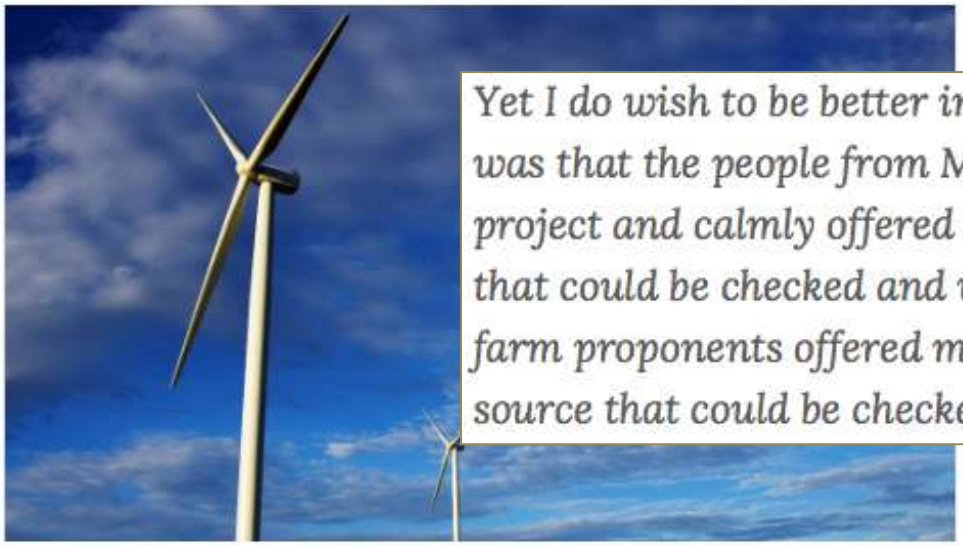
Bendigo Advertiser

Thursday February 23, 2017

Baringhup wind farm delayed

JOSH FAGAN

25 Jan 2013, 10:30 a.m.



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Town hall meetings are a longstanding feature of democratic engagement in Australia. Those following the development of wind energy will be well aware of the evolution (or should that be *de*-evolution) of the community meeting.

Yet I do wish to be better informed. The essential problem last night was that the people from MACWind gave rational explanations of the project and calmly offered many case studies and reviews of evidence that could be checked and verified. On the other hand the anti-wind farm proponents offered much sound, fury and fear but not one fact or source that could be checked out by anyone with an objective curiosity.

COMMONITY = commons + communities

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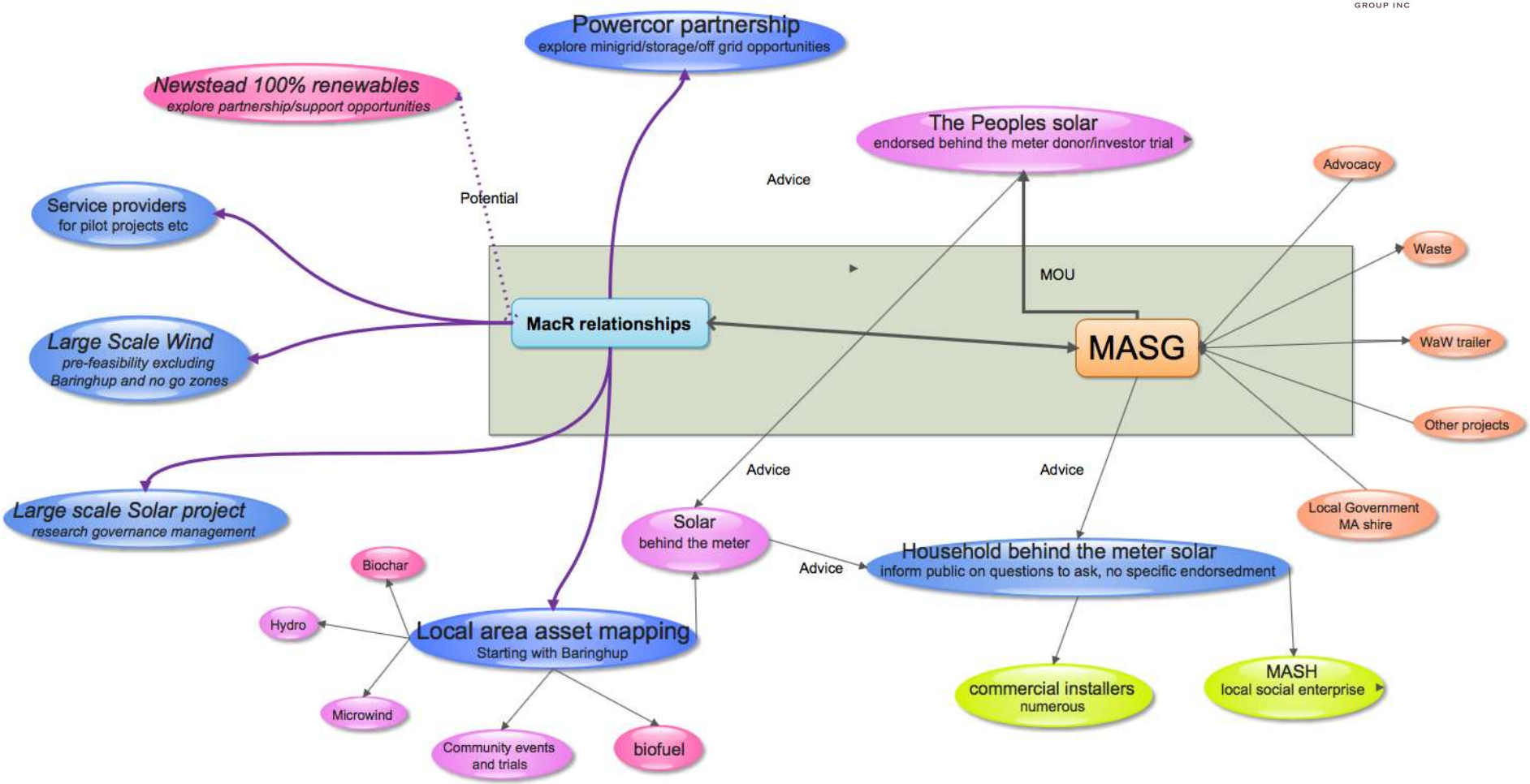

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OUR VISION

- Use renewable energy to produce a large proportion of our Shire's energy needs and reduce emissions

ZNET by 2025

- Projects which are strongly supported by the community
- Projects which are locally built, owned, (controlled), and operated and which uses local resources
- Financial, social, environmental, energy sustainability, and educative benefits flowing back to the community and local economy
- Take leadership on renewable energy and produce a scalable, replicable model which will be a beacon for others to follow

WHAT WHY WHEN HOW WHO?

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"The best way to predict the future is to create it."

The Blue Economy

(B + C)E = ?*

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Potential Renewable Energy in Baringhup

OPPORTUNITY (ON CURRENT MARKET)

Solar behind the meter (kW scale)
292 kW installed, 426MWh p.a 90 households supplied with 90% of their electricity needs or ½ of all houses
90 HOUSES
HIGH

Biofuel
Total resource using all oilseed crops (canola) is 350,000L biodiesel p.a.. Enough for 3700 cars, or 10 times the number of cars
3,700 CARS
HIGH

Biochar
2,100 tonnes p.a. biochar available using crop stubble with an additional potential 1,600 tonnes from Mallee tree alley farming.
2,100 TONNES P.A.
MODERATE

Biomass
1,200 to 8,500 tonnes p.a. of cereal straw, powering a 1MW plant could supply heat for 770 homes and electricity for 315 houses.
HEATING 770 HOUSES
ELECTRICITY 315 HOUSES
LOW

Hydro power (MW scale)
2MW size plant based at Cairn Curran dam generating 3000MWh p.a.. Enough for 450 houses or 2½ times the number of houses.
450 HOUSES
LOW

Large scale solar farms (MW scale)
17MJ/m² solar radiation with each 1MW installed requiring 2½ Ha. A 5MW farm would supply 1,100 houses electricity needs and abate 8,500 tonnes of CO_2 per annum.
1,100 HOUSES
LOW

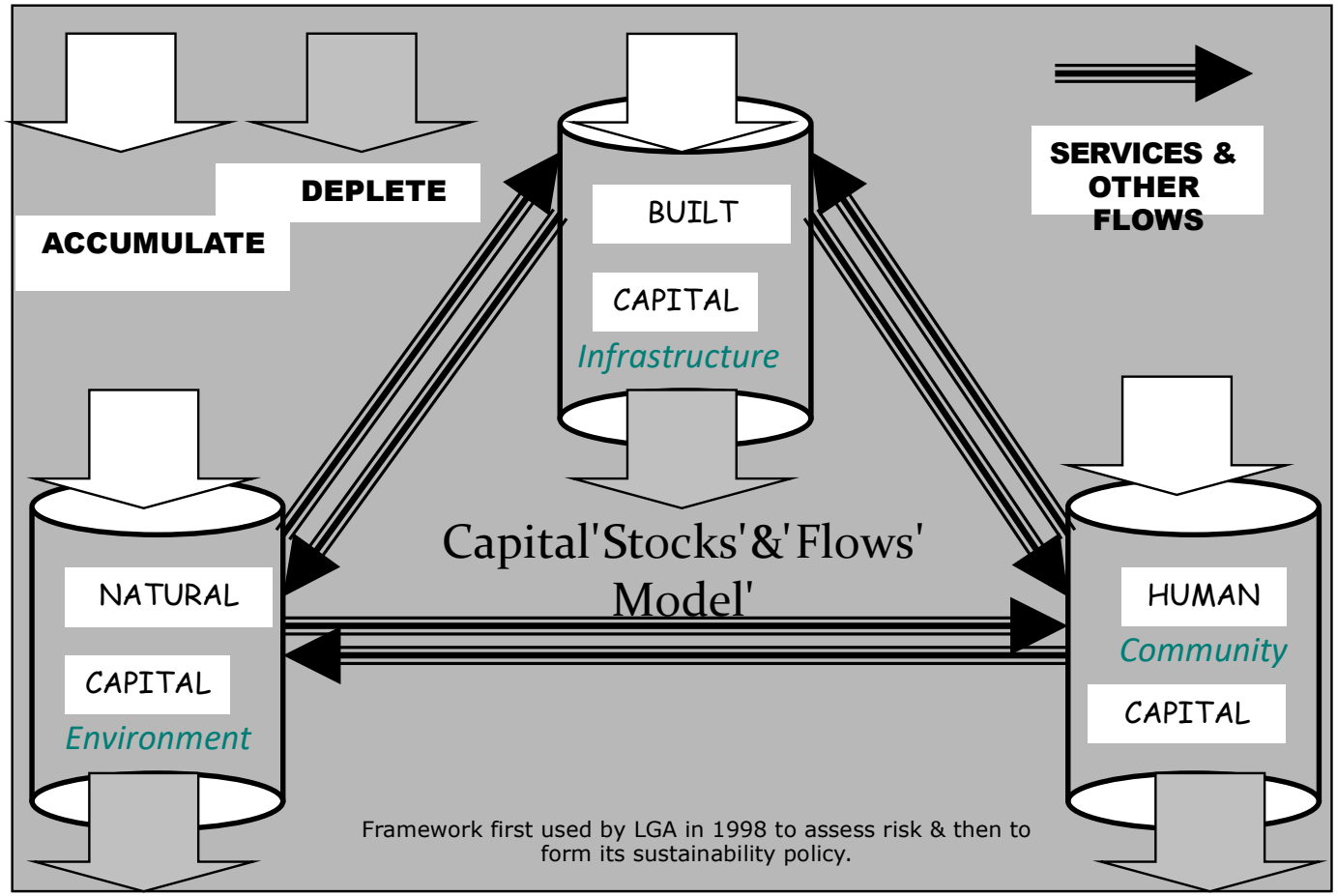
Small scale hydro power (kW scale)
7-20MWh p.a. using European Gravity Vortex Power Plants. Each 15kW of small scale hydro could supply the needs of 6 houses.
6 HOUSES EACH
LOW

Large scale wind power (MW scale)
Wind speeds of 6.5m/sec sufficient to power 6MW of wind generation producing 15,700MWh of electricity. This would supply the electricity needs of 2,300 houses.
2,300 HOUSES
LOW

Microwind (kW scale)
Estimated 9 dwellings with suitable resource, could produce 11.8MWh p.a. using 18 small 200w turbines or more if larger 5kW units are used.
9 HOUSES
LOW

Battery storage
Emerging technology with enormous potential to facilitate the widespread uptake of renewable energy. Currently 25 properties on stressed lines/fringe of grid may benefit from the use of integrated renewable production and onsite battery storage.
LOW

FOUNDATION for SUSTAINABLE DEVELOPMENT



IDENTIFYING THE BUILDING BLOCKS

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SUPPLY

SITE

EPA

SEWERAGE SLUDGE

GREEN-WASTE

FATS, OILS, GREASE

ABATTOIR WASTE

PPAs

SLUDGE

FRUIT WASTE

Natural Capital

Social Capital

BEHIND the METER

TRANSPORT

ELECTRICITY

TECHNOLOGY

HEAT

BIO-GAS

INVESTORS

ROI

DEMAND

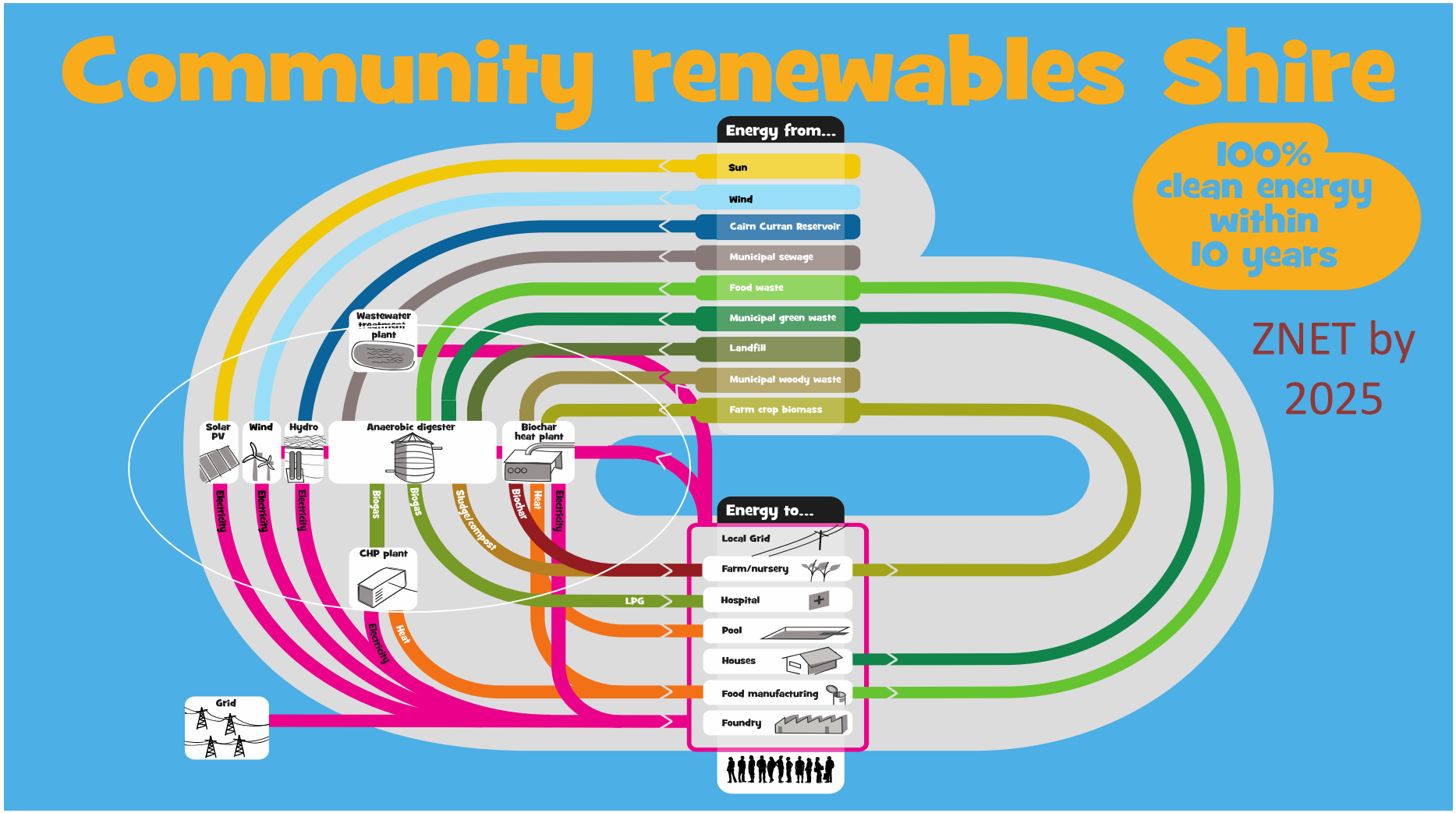
OFF-TAKE AGREEMENTS

CO-PRODUCTS

COMPOST

Built capital

Community renewables Shire



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Tackling climate change through local action

MASG COMMUNITY RENEWABLES

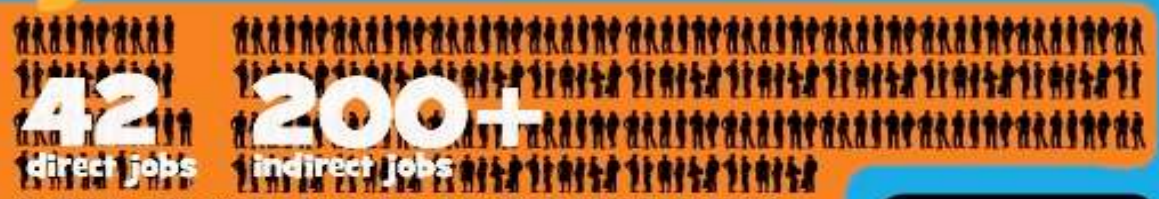
Taking Mount Alexander Shire to 100% clean energy by 2025.
masg.org.au/about/

Community renewables town*

RECYCLED & LANDFILL RUBBISH*

Community renewables JOBS*

if we move to 100% local renewables by 2025



for 20MW generation capacity — Castlemaine's current electricity, gas and transport needs

SOLAR PV land coverage

0.3% = 100%

of the world's land area covered in solar panels would supply of global electricity needs

SOLAR PV savings

A 3kw system cuts average power bills by

Community renewables EMISSIONS AVOIDED*

163,000+ tonnes CO_2/year

Community renewables LANDFILL*

121 tonnes/wk

could generate electricity and heating

SOLAR PV

now installed on **26%** of houses*

Community renewables HYDRO*

could supply electricity for **450** houses

SOLAR PV energy payback

Energy generated after **1-2 years** equals energy used in manufacturing PV panels

Community renewables BIOMASS/ BIOCHAR*

could supply electricity for **750** houses

WATER*

40 mega-litres used/week of which **20** megalitres is recycled

*Figures are for Castlemaine only.
Sources: MASG Research project.
Further information: ph 5470 6978
http://masg.org.au/about/contact/

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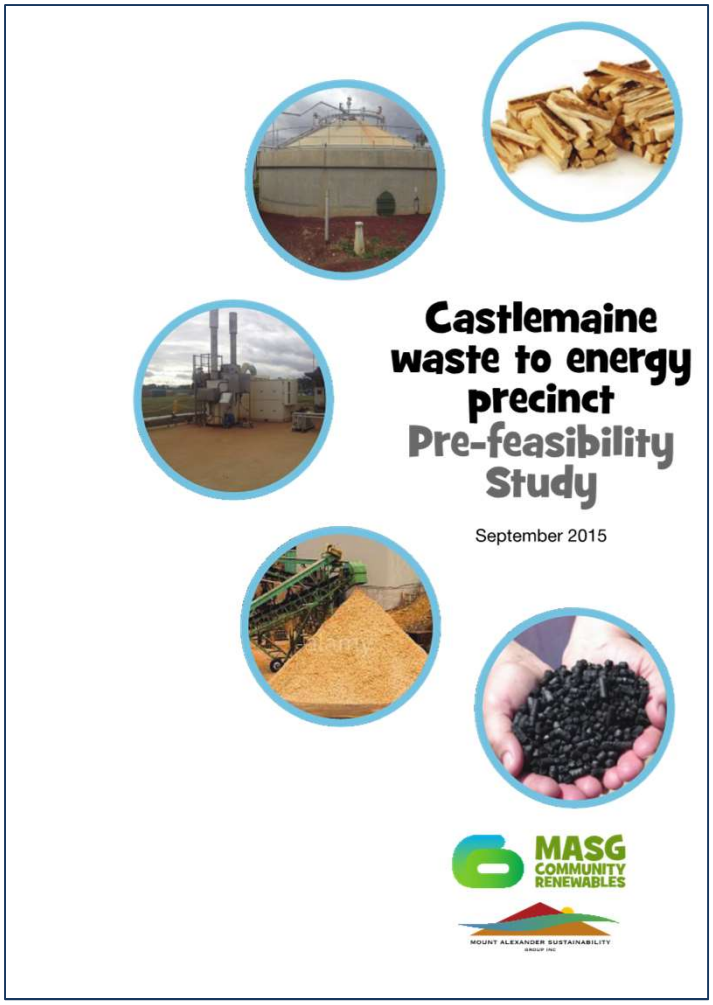

PRE-FEASIBILITY STUDY

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Initial estimates propose that for our town to move towards 100% renewable energy, we would need ~20MW of local generation (a large share being required by one major industry facility).

The renewable energy **could** be sourced from a combination of bio-fuels, wind, solar and hydro power, starting with the conversion of readily available waste streams to energy, and draw on off-sets from bio-sequestration (soil carbon and trees) or green power.

5,095 tonnes of CO2e emissions could be avoided per year, with another 50,000 from soil carbon.

Recommendation of PFS: Develop Full Feasibility Study

ZERO NET EMISSIONS ≠ 100% LOCAL RENEWABLES

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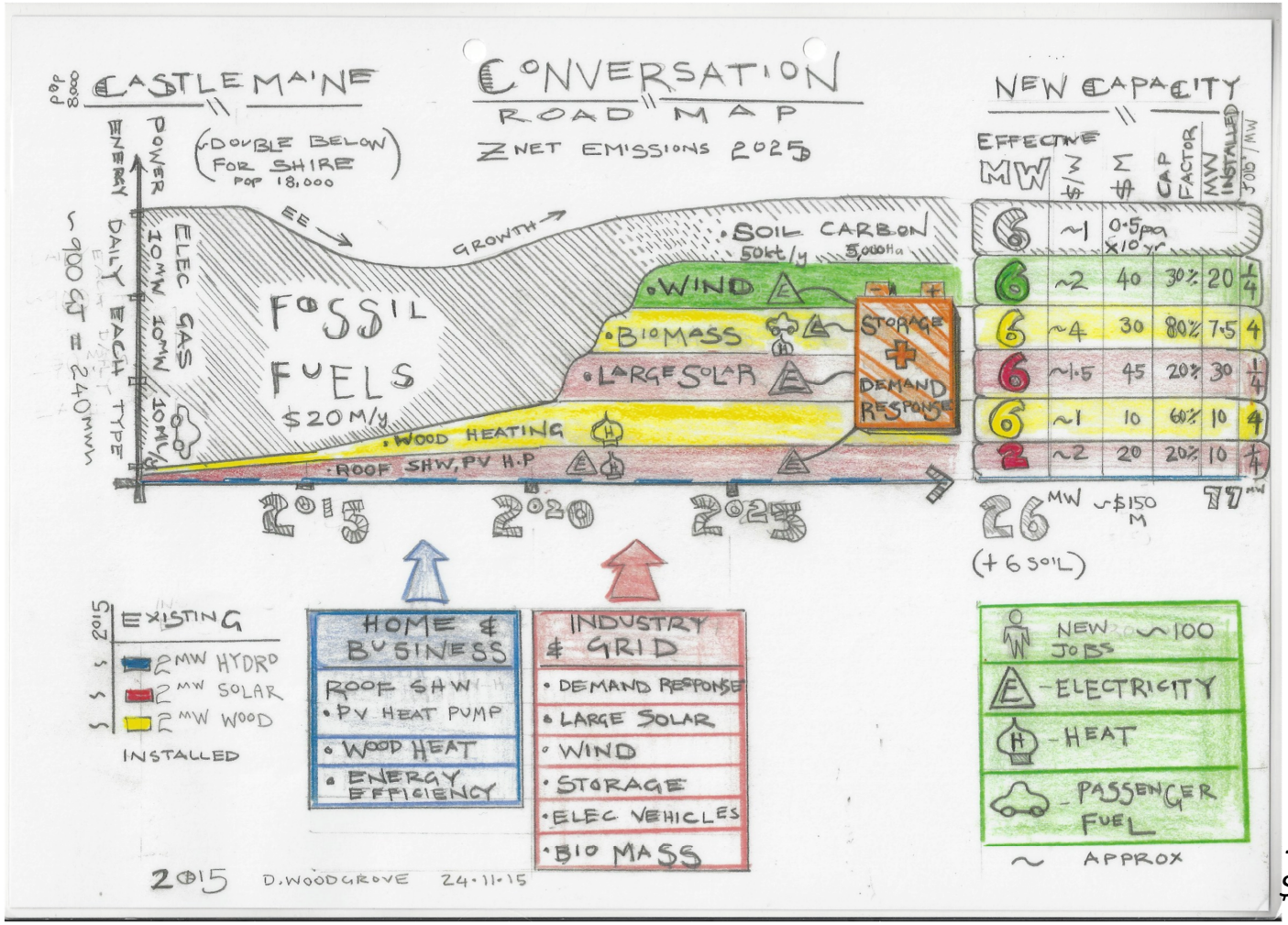


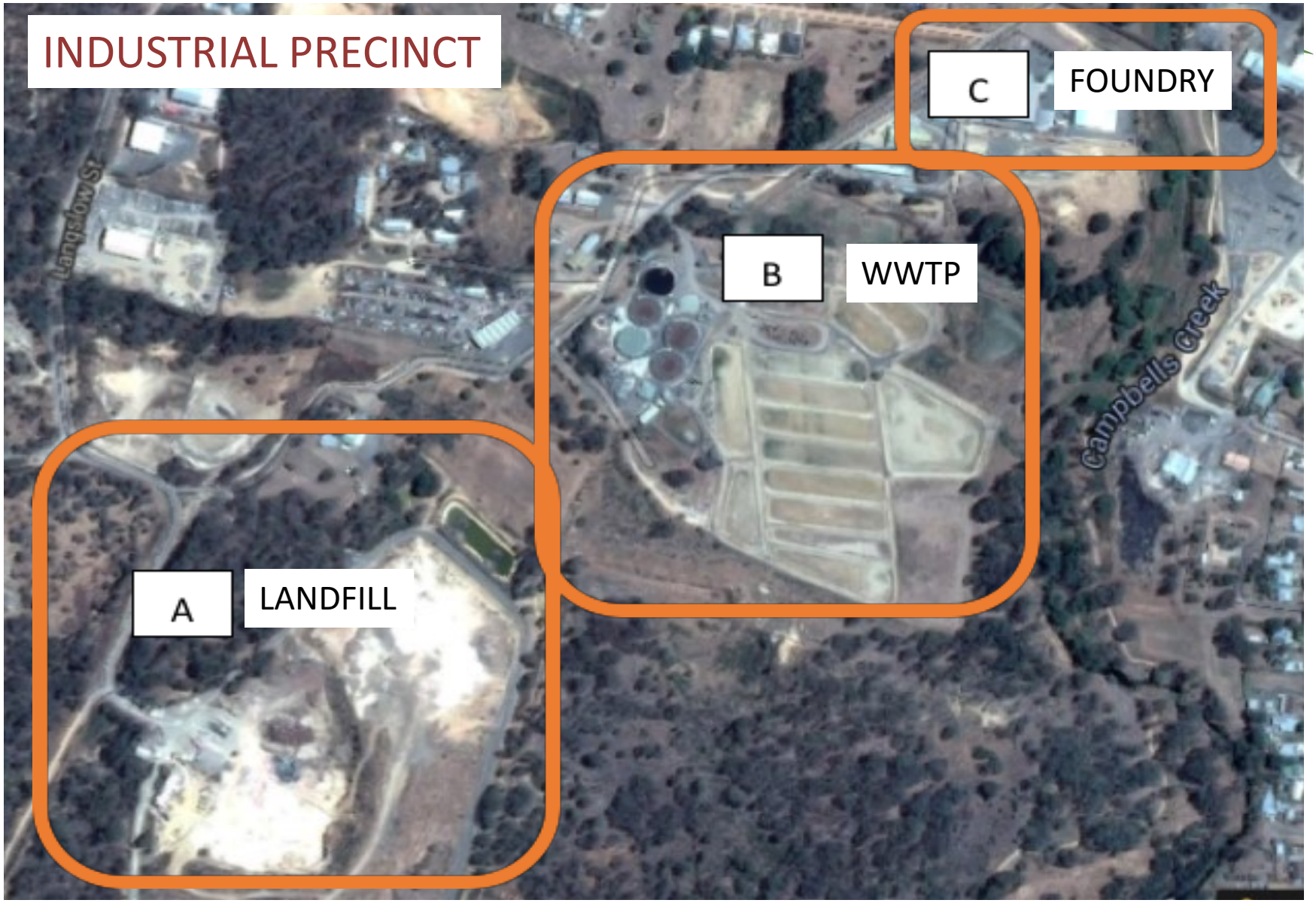
DID YOU KNOW?

Carbon Drawdown Potential
(tCO2e p.a.)

for 100tCO2e

100kW solar = ~10ha soil

$1600/tCO2 *$10/tCO2*


INDUSTRIAL PRECINCT
C
FOUNDRY
B
WWTP
A
LANDFILL
Campbells Creek

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GROUP INC

STAKEHOLDERS

Australian Government

$ tbc

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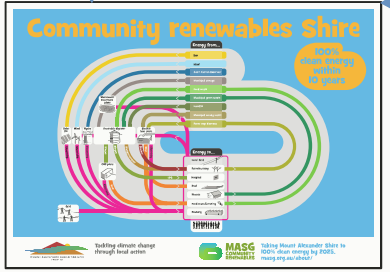
VICTORIA State Government | Environment, Land, Water and Planning

$

MOUNT ALEXANDER SHIRE COUNCIL

Coliban WATER



DON Is Don. Is Good. SINCE 1947

EPA VICTORIA

MASG COMMUNITY RENEWABLES

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McKinnon Family Foundation

Technical Partner

MOUNT ALEXANDER SUSTAINABILITY GROUP INC

eco2sys realising sustainability

Loddon Mallee Waste and Resource Recovery Group

VICTORIA State Government

Powercor AUSTRALIA

ENABLING (HOLISTIC) TECHNOLOGIES

A/D

Biomass

Heat plant & Biochar

Key metrics:

- Energy density
- LCOE
- ROI
- Resilience
- Zero waste
- Holistic solution

Combined heat & power

Compost from digestate

Soil carbon

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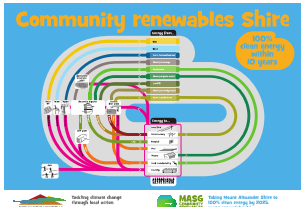
WHAT NOW?

2017: **Full Feasibility Study & Bankable Business Case**

2018: Commence building integrated waste to energy facility

KEY LEARNINGS:

- Create a POWERFUL VISION then share it
- Engage with Community (Business, Public and Government) – WIFM
- Involve the best people in locality & collaborate
- Patience, Persistence ……
- Enjoy the ride



* (B+C)E = ZNET 2025