



# CAPABILITY STATEMENT

| BioEnergy & Renewable Natural Gas (RNG)

2022





**FIRSTLY**

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# THANK YOU

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**FOR CONSIDERING US!**

Green energy from renewable organic sources has huge opportunity in Australia.

Whether your interest is driven by turning an organic waste disposal cost into an energy revenue stream, demand for energy (gas, power, heating & cooling), reduction of greenhouse emissions or a combination of all of these, WE can develop the right solution.

As the global energy focus changes, we are proud to continue supporting traditional long-term clients as well as building new relationships in new markets and regions.

Weltec and Enscope have a history of successful project delivery in the Energy and BioGas sectors globally for over 20 years.

We are outcome-focused and look forward to working with you to achieve your goals on your next BioGas project.

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## **WE ARE RELIABLE**

The Weltec process guarantee has consistently delivered upon technical requirements on over 350 projects in 25 countries around the world.

WE put all projects through detailed scrutiny at feasibility stage, to ensure that the operating plant performs as expected every time.

# THE PARTNERSHIP YOU NEED FOR **PROJECT SUCCESS**

## **...AND HOW WE CAN PROVIDE IT**

Weltec and Enscope have joined forces to provide a team with expertise in all elements of BioEnergy project delivery within Australia.

With a global track record in BioGas and BioMethane projects, combined with local engineering, construction and commissioning know-how, you can be confident that your project will meet performance expectations, Australian Standards and budget metrics.



### **WE ARE COST EFFECTIVE**

WE work with our clients to develop optimum solutions based on their unique requirements, feedstock and gas compositions. WE can provide power, gas, heating and cooling options to maximise energy efficiency. WE only proceed with projects that we know will meet our clients' expectations.



### **WE PROVIDE 100% RENEWABLE ENERGY SOLUTIONS**

Energy generated by Anaerobic Digestion of organic materials is 100% green, and part of the circular economy. In many cases such energy sources are a net greenhouse reduction, capturing methane that would otherwise be naturally released to the atmosphere by organic decomposition.



### **WE ARE SAFE**

With Weltec's enviable 20 year history in bioenergy developments globally and Enscope's wealth of experience in gas and energy developments in Australia and beyond, you can be sure that the plant will meet high standards of process and operational safety.



### **WE ARE SCALABLE**

Using modular technology, WE can provide an optimum solution to any organic material or biogas processing volumes, and can provide for multi-stage expansion of the plant where future growth is anticipated.





# WHAT WE CAN OFFER

THE POWER OF WELTEC & ENSCOPE



## OVERVIEW OF OUR SERVICES

Strength in partnership

With relatively few Renewable Natural Gas (RNG) and Anaerobic Digestion (AD) energy projects developed in Australia compared to the rest of the world, it is important to engage with a team that has in-depth knowledge of such applications to provide certainty of outcomes. Weltec and Enscope have joined forces to provide excellence in all aspects of AD and RNG plant delivery.



Track record in multi-discipline project delivery across Australia —directly on behalf of customers or under a range of contract mechanisms. Process-oriented approach to whole of project planning ensures smooth transition between design, construction and commissioning.



End-to-end process guarantee on AD and Gas processing modules.



Australian construction industry experience ensures safety, IR and other project success factors are achieved.



Australian Standard and Regulatory compliance of entire plant.



Dedicated process, commissioning and after-care teams ensure your plant performance is optimised at commissioning and continues to operate to specification after the project is completed. *WE* are there to support you.



Renewable funding eligibility and technical support, regulatory approvals support, emissions reduction calculations.



Feedstock analysis and bespoke process design to ensure that your plant operates as it should.



End-to-end project management locally provides our clients a single interface and point of accountability.



German manufacturing to the highest standards. Every module is made to the specific project requirements.



Gas and power industry knowledge to facilitate gas-to-grid and power-to-grid applications.

ENSCOPE

WELTEC

WE



# BIOENERGY SOLUTIONS



WE provide tailored solutions for generating biogas from organic feedstocks.

WE also provide a range of base-load energy delivery solutions based on our own biogas production, or for existing biogas streams (eg: wastewater treatment plants), including:

- Grid-connected or behind-the-meter power solutions
- Process heating and cooling
- Refinement of biogas into green biomethane suitable to be injected into domestic gas networks — replacing fossil fuel methane with green biomethane

## OUR APPROACH

- > Every feedstock is different. Assessment of feedstock composition and variability enables the right process technologies to be selected. WE can design plants suitable to feedstocks that are reliably consistent or highly variable, and can provide guidance on how to best manage feedstocks during operation to maintain outputs within specification.

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- > Only when we can ensure project success do we proceed with development.

## BIOENERGY PROJECT LIFECYCLE SUPPORT



**Initial Project Site Visit**  
1-2 weeks



**Feasibility Study**  
1-3 months



**Project Development**  
2-3 months



**Design, Engineering & Pre-Construction**  
6-8 months



**Construction & Commissioning**  
6-14 months



# ENSCOPE

## COMPANY OVERVIEW

Development. Engineering. Management. Completions.

Enscope provides project management, engineering, construction and commissioning services in support of energy infrastructure developments.

Enscope is an outcomes-focused project services organisation providing project feasibility, management, engineering, project controls and completions services to the mid-size gas and energy sector.

We have established offices in Perth, Brisbane, Melbourne and Darwin.

### CORE SERVICES



NATURAL GAS COMPRESSOR STATIONS



NATURAL GAS PIPELINES & FACILITIES



GAS CONDITIONING & GAS TREATMENT FACILITIES



GAS STORAGE FACILITIES



DECARBONISATION & RENEWABLE ENERGY



POWER STATIONS

## OUR VALUES

Act with integrity.

Be accessible and accountable.

Apply innovation to continually improve.

Strive to promote a culture of safety in all our work.

## THE QUANTA ADVANTAGE

In 2015, Enscope was integrated into the Quanta Services group of companies. Quanta collaborates with our customers to provide the best, most comprehensive solutions on projects of any size. We will self-perform the core of our business, delivering cost certainty and safe execution. Every project, every time.

2020 ENR #1 SPECIALITY CONTRACTOR

2020 ENR #1 ELECTRICAL CONTRACTOR

2020 ENR #1 UTILITY CONTRACTOR

**\$12B+**

2019 revenues — more financial capacity than competitors to tackle major projects

**300+**

strategic operating centres across the US, Canada & Australia

**~63,000**

pieces of unmatched specialised equipment resources



# FOOD WASTE TO HEAT & POWER

## CASE STUDY: MELBOURNE, AUSTRALIA

### PROJECT SUMMARY

Weltec provided design, construction, commissioning and operational support for the Yarra Valley Water AD plant.

Through biogas production from waste foods, Yarra Valley Water's wastewater treatment plant has become energy self-sufficient. Surplus electricity is fed into the public grid.

Except for the loading of the feedstocks, the process is fully automated.

The size of the pre-storage tanks was designed such that no loading is required at the weekend or at night.

### PROJECT DATA

#### COMMISSIONING

December 2016

#### INPUT MATERIALS

Leftovers from cafeterias and restaurants, fats and oils, brewery and dairy leftovers, fruit and vegetable waste and sludge

### TECHNICAL DATA

#### ENTRY SYSTEM

2x 35m<sup>3</sup> dosing feeder, Shredder, MULTIMix

#### PRE-STORAGE TANK

5 tanks made of stainless steel with a total capacity of 700m<sup>3</sup>

#### DIGESTER

2x 3,573m<sup>3</sup> (Ø 26.87m, H 6.30m)

#### STORAGE TANK

1x 4,531m<sup>3</sup> (Ø 29.94m, H 6.30m)

#### CHP

2x 530kW<sub>el</sub>

#### MISCELLANEOUS

Pasteurisation, LoMOS control system



The digesters are continuously supplied with substrates from five pre-storage tanks.



European process experience successfully implemented in Australian conditions.



# WELTEC BIOPOWER

## ORGANIC ENERGY WORLDWIDE

More than 20 years of experience

### GROUP WIDE KNOWLEDGE CREATES VALUABLE SYNERGIES.

Weltec covers the whole biogas value chain. From global plant construction and own plant operation, to energy trading. The knowledge from each area strengthens our capabilities.

### YOU HAVE THE RAW MATERIALS. WE HAVE THE TECHNOLOGY.

In addition to substrate analysis, we also take into account the underlying climatic and infrastructure factors as well as the customer's strategic focus.

### CUSTOMISED PLANT CONCEPTS ARE PARAMOUNT.

The establishment of individual, technically mature solutions is one of our strengths. The high proportion of custom-developed components is a key success factor.

## WELTEC KEY FACTS

**MULTIPLE AWARD WINNING, INCLUDING "BEST INTERNATIONAL COMMERCIAL AD PLANT 2017" FOR AN AUSTRALIAN PROJECT**  
—UK ANAEROBIC DIGESTION & BIORESOURCES ASSOCIATION

**WORLD-LEADING IN STAINLESS STEEL AD PLANTS**

**IN-HOUSE MANUFACTURING OF TANKS, PROCESS EQUIPMENT AND PLC CONTROL SYSTEM**

**IN-HOUSE BIOLOGY DEPARTMENT**

**SPECIALISED ENGINEERS DESIGN EACH PLANT INDIVIDUALLY**

## OUR COMPANY IN NUMBERS



120

dedicated team members



21

years of experience



~530,000

tonnes/annum of CO<sub>2</sub> are saved by Weltec plants



350+

successful projects worldwide



# FOOD WASTE TO BIOMETHANE PLANT

## CASE STUDY: PONTEFRACT, ENGLAND

### PROJECT SUMMARY

The plant went into operation after a record construction period of just six months and feeds c7.3 million cubic meters of biomethane into the British gas distribution network every year.

This equates to around 9,600 households sustainably supplied with environmentally friendly natural gas.

Recovering valuable energy from food waste and agricultural waste, biomethane plants such as those from Lanes Farm Energy play an ever increasing role in the energy mix in UK and around the world.

### PROJECT DATA

**COMMISSIONING**  
October 2019

**CONSTRUCTION TIME**  
6 months

**INPUT MATERIALS**  
80,000t feedstock  
≈ 55% food waste  
≈ 30% grass & hybrid rye  
≈ 15% slurry, manure & chicken litter

### TECHNICAL DATA

**ENTRY SYSTEM**  
2 Push floor dosing feeder (200 & 110m<sup>3</sup>) + 2 MULTIMix

**PRE-STORAGE TANK**  
3x 342m<sup>3</sup> with stainless steel floor  
2x 100m<sup>3</sup> fibreglass tanks

**DIGESTER**  
4x 6,848m<sup>3</sup> (Ø 31.5m, H: 8.8m)

**PRODUCTION OF RAW BIOGAS**  
≈ 1,850Nm<sup>3</sup>/h

**PROCESSED BIOMETHANE**  
≈ 850Nm<sup>3</sup>/h

**METHANE CONTENT (CH<sub>4</sub>)**  
>99%

**BIOGAS UPGRADING**  
Membrane technology

**MISCELLANEOUS**  
Separation, pasteurisation,  
330kW CHP for heat supply



Two push floor dosing feeders, each with a MULTIMix, ensure that the digesters are continuously filled.



The stainless steel pre-storage tanks are equipped with a stainless steel floor.

# TECHNOLOGY

## BIOGAS UPGRADING TO RNG with membrane technology

### EASY AND FLEXIBLE GAS PROCESSING

In the first stage of biogas processing, the biogas is pre-dried, scrubbed and desulphurised with active carbon. Before the actual gas separation process takes place, the gas must be compressed to 8-15 bar.

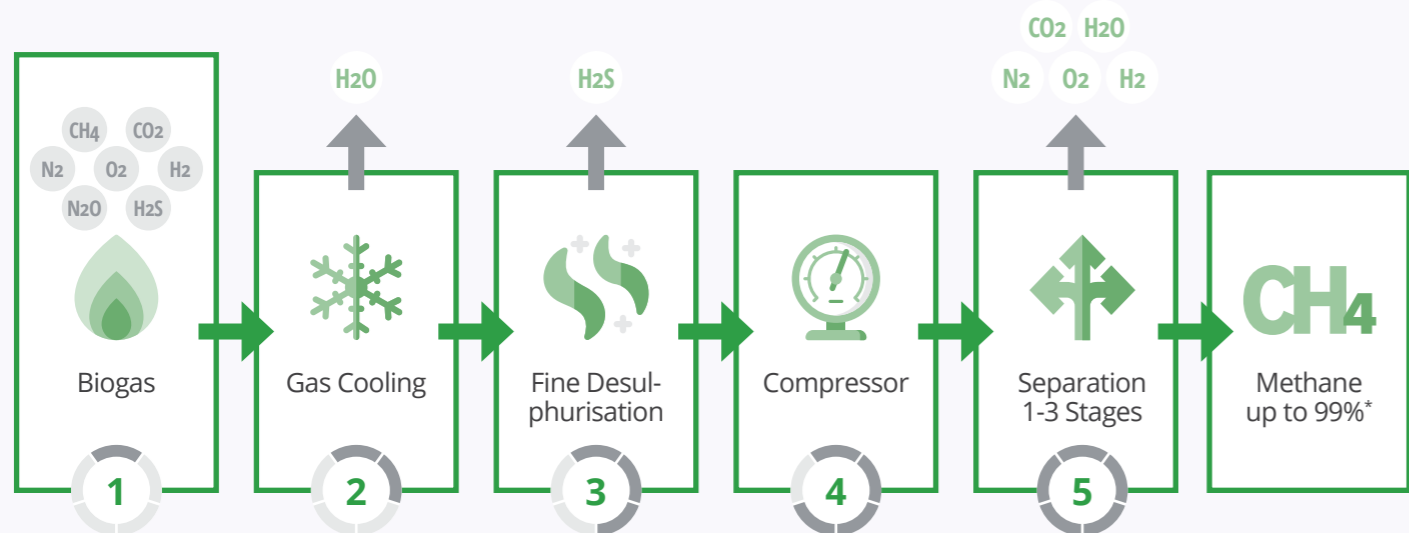
Subsequently, the CO<sub>2</sub> and water vapour are separated from the methane. Special polymer membranes through which the raw gas is forced have been developed for this process stage. The membranes are able to separate the CO<sub>2</sub>, H<sub>2</sub>O and CH<sub>4</sub> molecules due to their different sizes and solution behaviours. For instance, CO<sub>2</sub> molecules are smaller than methane and pass through the micro-pores of the membranes faster than methane.

The three-stage separation of WELTEC BIOPOWER can reduce the methane slip to less than 0.5 percent.

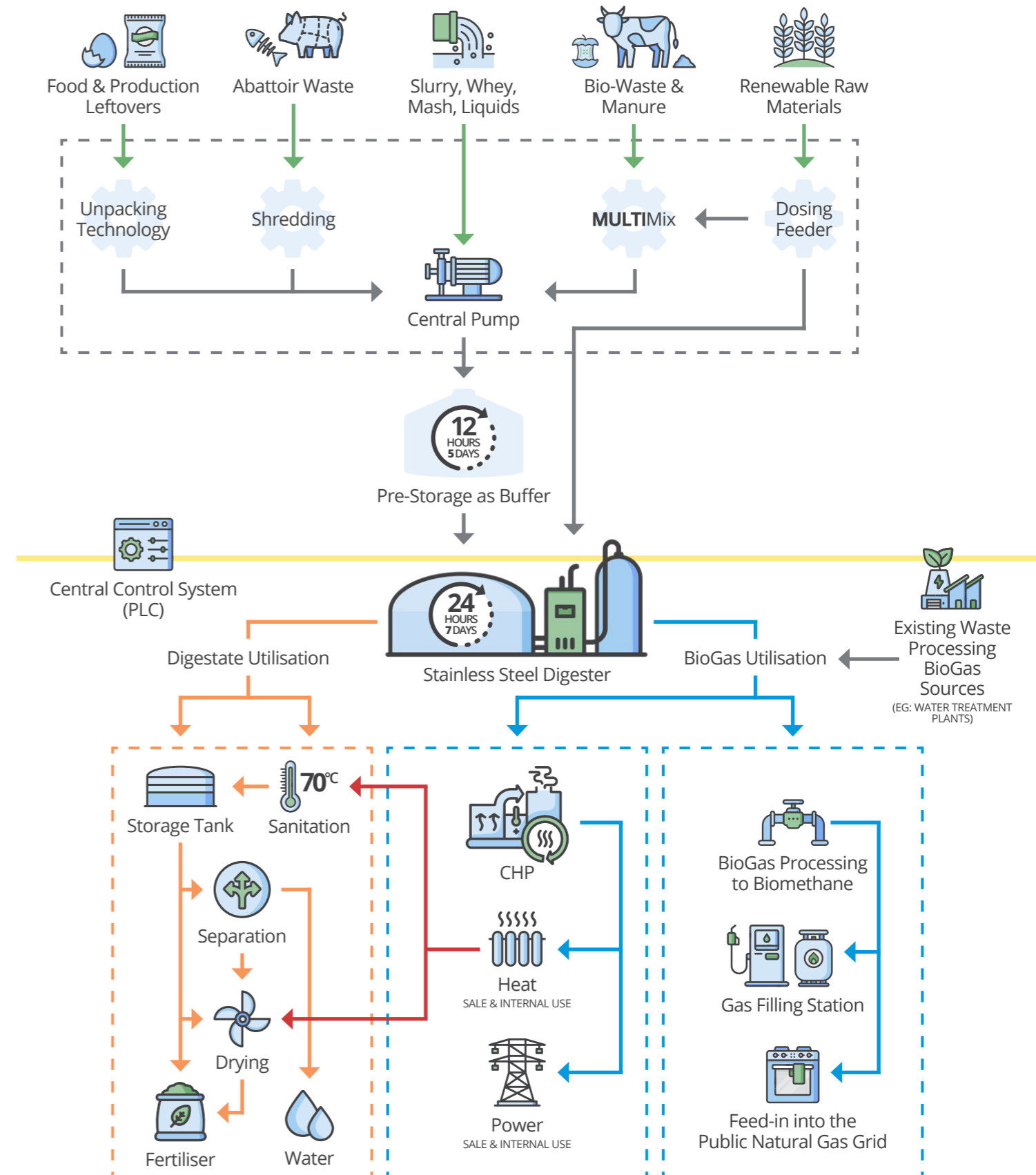
### BENEFITS

- Methane yield of up to 99 percent through multi-stage procedure
- Intelligent control ensures uninterrupted gas feed-in
- Extremely high plant availability & low maintenance overhead thanks to durable membranes
- Easy to operate
- Modular structure enables extensions
- Quick installation thanks to compact container setup
- Separation of the molecules without any additional aids such as chemicals or water
- Separation without any further need for heat
- No downstream dryer required
- Feed-in into the natural gas grid possible in some applications without additional compression

**These benefits mean low plant and operating costs for you!**



## BIOGAS PRODUCTION and utilisation process



12 HOURS / 5 DAYS

24 HOURS / 7 DAYS





## ENQUIRIES

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