



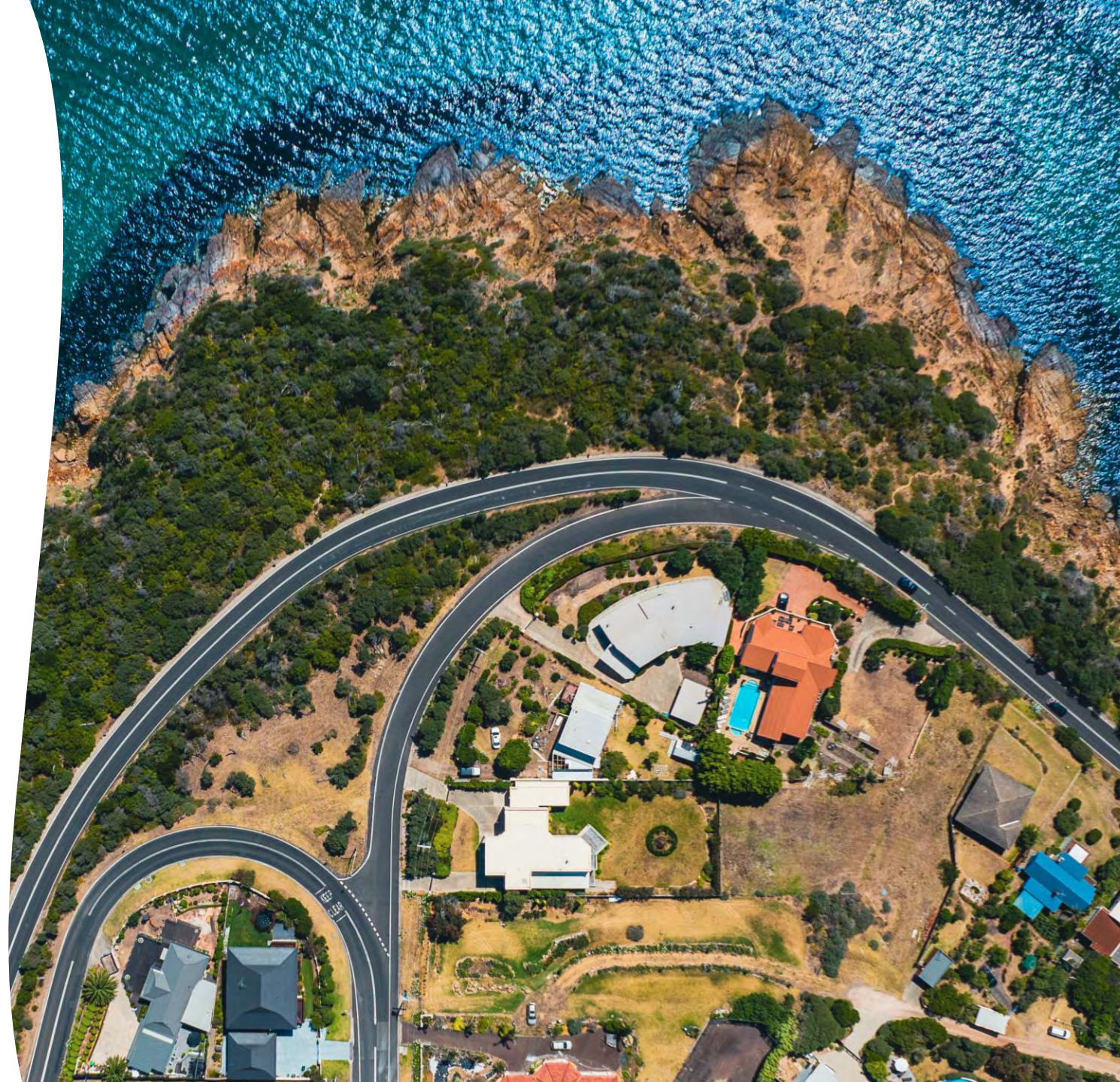
PYROCO – BLOSOLIDS
MANAGEMENT
PATHWAY FOR
AUSTRALIAN WATER
SECTOR

Eamon Casey,
Technical Director
Iota Services



The Biosolids Challenge

- Contaminants
- Disposal
- Distribution
- Emissions
- Limited Options



Biosolids Management (Aust.)

- 943: Guidelines for environmental management: Biosolids land application 2014
- Queensland ENEW07359617: End of Waste Code Biosolids 2021
- Draft PFAS National Environmental Management Plan (NEMP 3) 2022



PYROCO Biochar Roadmap



2017
R&D Project
development and
funding success



2019
Semi-pilot
scale trials (0.5-
1 dry kg/hr)



2023
Pilot Plant (Mk2)
20 dry kg/hr –
integrated
pyrolysis and gas
producer



2026
Operate
100kg/hr
Demonstration
Pilot Plant
(Mk3)

2015-16
Master Projects
– Preliminary
biosolids
Pyrolysis study



2018
Bench-scale
trials (20-50 gm)
and preliminary
techno-
economic
assessment



2021
Pilot Plant
(Mk1) – core
reactor

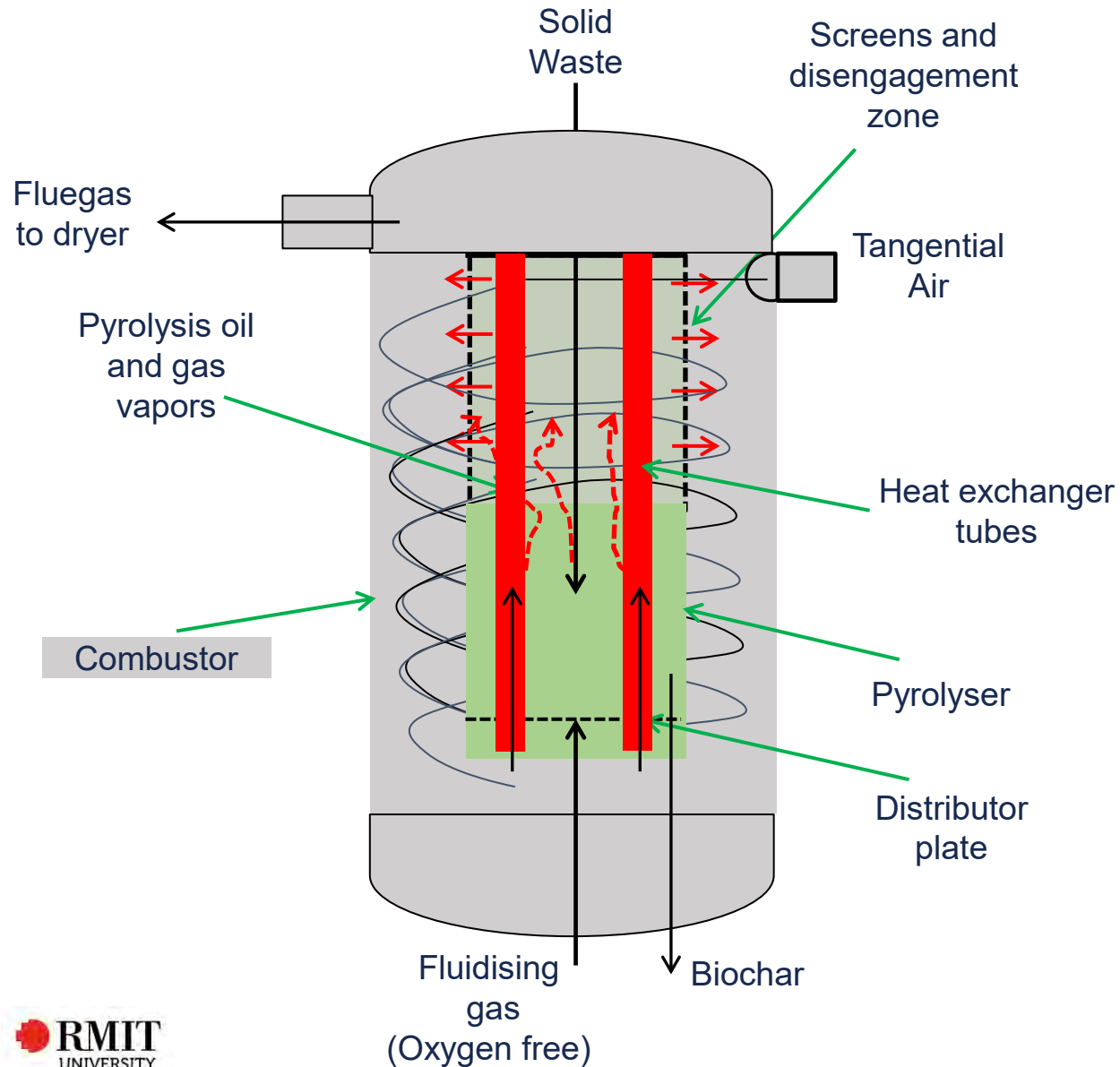


2024
Pilot Plant
(Mk2) Phase 2 –
expanded
feedstocks

2028
First Production
Plant
10 dry tne/day



How PYROCO works?



Why PYROCO?

Reduced Cost

- Simple elegant tube structure & small footprint – lower capital cost
- Lower energy & no moving parts in thermal zone – lower operational cost
- Long plant life & minimal downtime – lower maintenance cost

Environmental Impact

- Pyrolysis highest carbon sequestration
- Fluidised heat exchanger efficiency can realise thermal neutrality –very low LPG use

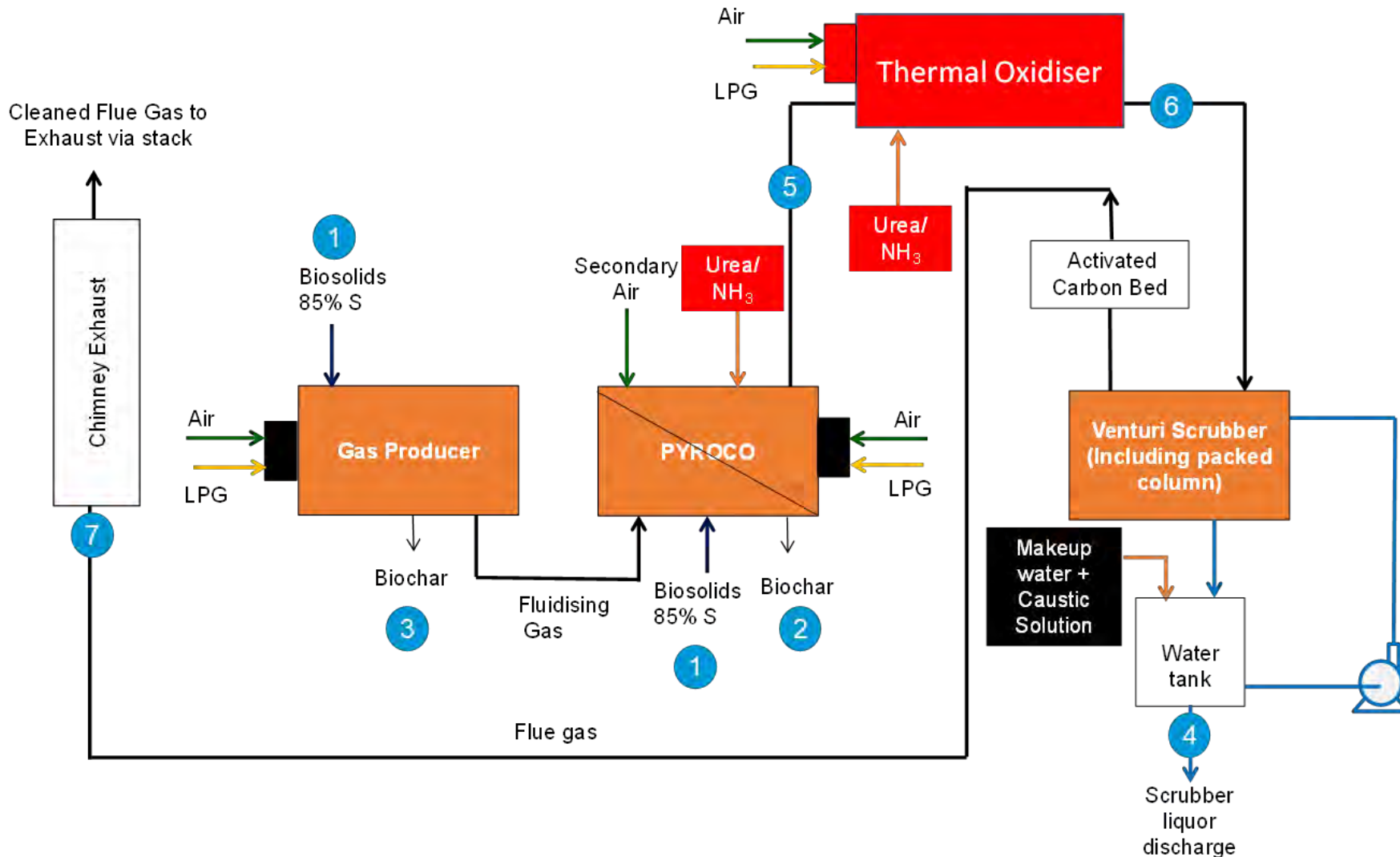
Biochar

- Quality & consistency key to industrial commercial market
- High Cation Exchange Capacity, low tar & PAH contamination, etc

Fluidised Heat Exchanger

- Scalable

PYROCO (Mk2 Pilot Plant) Process Flow



Sampling Points

- 1 Feedstocks before thermal treatment
- 2 Pyroco Biochars after thermal treatment
- 3 Gas Producer Biochars after thermal treatment
- 4 Scrubber water during plant operation
- 5 PYROCO exit during plant operation
- 6 Thermal oxidiser outlet during plant operation
- 7 Scrubber outlet before chimney stack during plant operation

PYROCO Mk2 Pilot Plant – November 2023



1. Biosolids Feed

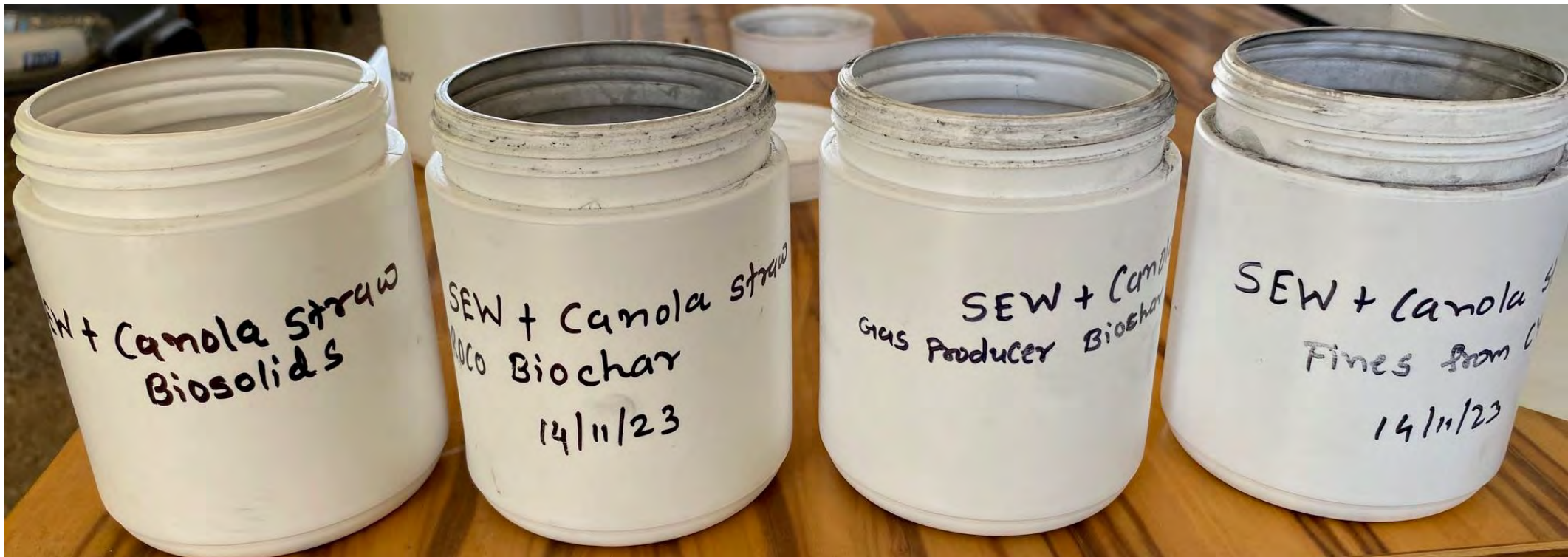
2. Gas Producer

3. PYROCO Reactor

4. Thermal Oxidiser

5. Scrubber

- 20kg/hr dry biosolids feed rate
- Six feedstocks
- Metro and regional
- Biosolids, mix biosolids and straw, and a FOGO
- 1-2mm granules
- 4-20mm pellets





“Our novel pyrolysis technology has huge potential to provide Plan B option for biosolids management in Australia and is likely to enable a circular economy by turning biosolids into a commercial biochar product of value”

Dr Aravind Surapaneni

Principal Scientist, South East Water





Next Steps





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