CLEANAWAY

Making a sustainable future possible together

Bromelton Energy and Resource Centre
Stakeholder Reference Group

Meeting #4 | 27 November 2025

Acknowledgement of Country

Cleanaway acknowledges the Traditional Owners of the lands on which we operate and in the communities in which we exist. We pay our respect to all Aboriginal and Torres Strait Islander peoples.

Artwork by Marcus Lee, a proud Aboriginal descendant of the Karajarri people from North Western Australia.

It represents Cleanaway's commitment to fostering a sustainable circular economy and symbolises our deep respect for the land, oceans and waterways of Australia.

The three central circular clusters represent the three pillars of reconciliation: Relationships, Respect and Opportunities. These three pillars provide the backbone and support for Cleanaway's ongoing reconciliation journey.

Agenda

1. Welcome and introductions – specialist presenters
2. Update from public forum
3. Deep dive specialist presentation topics:
    i. Dr Taku Ide, Head of Carbon: Cleanaway's decarbonisation & EfW carbon
    ii. Dr Jeroen Wassenaar, Head of Innovation: Cleanaway's investments in plastic recycling
4. 2026 look ahead and suggestions
5. Next meeting
6. Actions and close

Public forum update

Julie / Nicole

Cleanaway's decarbonisation & EfW carbon

Dr Taku Ide

Head of Carbon

Cleanaway is committed to a 1.5°C future

In FY23, we set a target for our operational CO_2 and CH_4 emissions to keep the world on a 1.5°C trajectory, informed by leading scientific literatures, international agreements, and Nationally Determined Contributions

		IPCC	COP26	CLEANAWAY
CH_4	2030	**-28%** (Range: -9 to -51%)	**-30%** (vs. 2020)	**-34%** (equivalent to -30% vs. 2020)
	2050	-48% (Range: -33 to -74%)	**Deep reduction**	**-57%**
CO_2	2030	**-38%** (Range: -14 to -67%)	**-43%**	**-43%**
	2050	**-98%** (Range: -70 to -131%)	**Net zero**	**Net zero**

Comparison of societal emissions, with and without an EfW powerplant

World 1: Waste is incinerated in a WtE facility to generate electricity	World 2: Electricity is drawn from the grid and waste is sent to landfill	
	  	
Emissions source: CO_2 emissions from incinerating residual, non-recyclable waste	**Emissions source 1:** CO_2 emissions from generating baseload electricity	**Emissions source 2:** CH_4 emissions from fugitive (gases not captured) landfill gases

- **World 1:** A world with EfW plant where electricity is generated from incinerating residual MSW and residual C&I waste; and
- **World 2:** A world without an EfW plant where the waste that would have been thermally treated at the EfW plant is landfilled and the same amount of baseload electricity is drawn from the grid.

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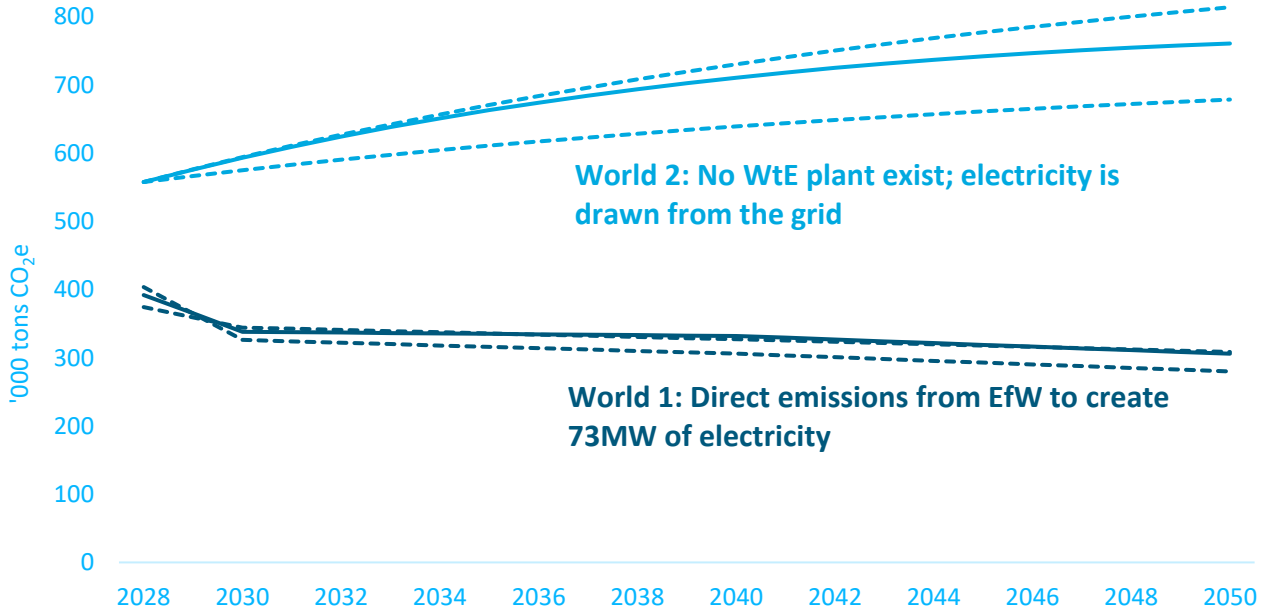
Reducing societal emissions with an EfW powerplant



The world with an 80MW EfW plant v. a world without an EfW plant can:

- *Save, on average,* ***356kt CO_2e/yr[1],*** *and*
- *Deliver a* ***cumulative emissions savings of approximately 8.2mt CO_2e between 2028 and 2050***

1. The analysis is based on assumptions, including, but not limited to: EfW electrons displacing the marginal carbon intensity baseload power, waste mass input, waste composition changes over time, gas capture efficiency rates at landfills.

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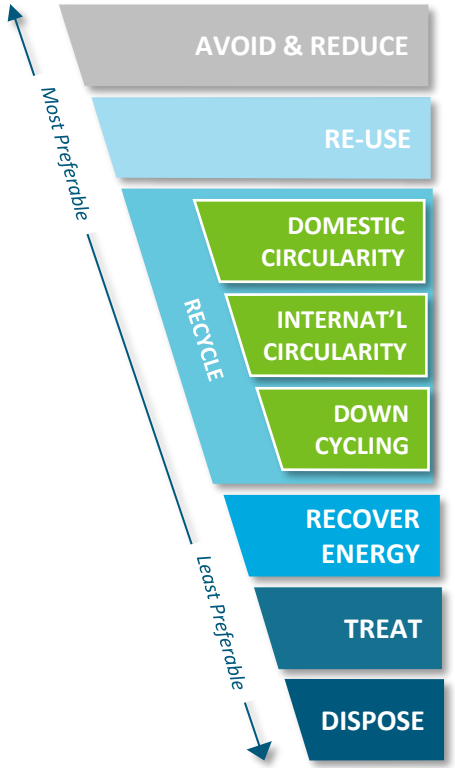
Cleanaway's investments in plastic recycling

Dr Jeroen Wassenaar

Head of Innovation

Cleanaway waste hierarchy for plastics



Waste Hierarchy	Plastics Solutions
AVOID & REDUCE	Regulate the use of single use plastics where alternatives exist
RE-USE	Design for maximising plastic re-use
DOMESTIC CIRCULARITY	Domestic mechanical recycling for rigid PET, HDPE, PP and clear LDPE film; pyrolysis + polymerisation for soft plastics packaging and other hard to recycle plastics
INTERNAT'L CIRCULARITY	Export of processed plastic products for further re-processing and value-creation overseas, e.g. export of washed flake or pyrolysis oils
DOWN CYCLING	Recycling of plastics into lower order and generally lower value outputs, e.g. food grade plastics to road applications, bollards, park benches etc.
RECOVER ENERGY	Energy from plastics not recovered from residual waste is safely harnessed through Energy from Waste facilities
TREAT	Not applicable
DISPOSE	Avoid – resource and value is lost

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A leading advanced plastics recycling platform

Integrated network of collections, including container return schemes, MRFs, plastic recovery facilities and 3 advanced plastic pelletising facilities and soft plastics recycling currently under feasibility study

Innovation through partnership

TOMRA Cleanaway

Collection and sorting of CDS eligible containers

TOMRA CLEANAWAY

Circular Plastics Australia

Mechanical recycling of PET, HDPE and PP containers into food grade resin

CIRCULAR PLASTICS AUSTRALIA PE

CIRCULAR PLASTICS AUSTRALIA PET

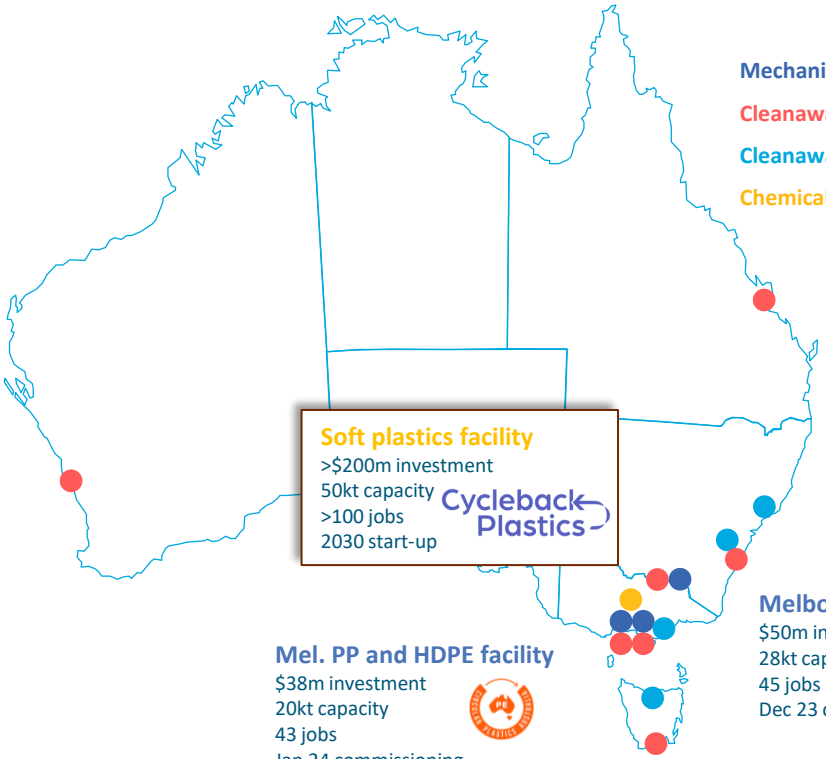
CREATED BY PACT CLEANAWAY Asahi Beverages Coca-Cola Amatil Partners

Cycleback Plastics

Chemical recycling of soft plastics into food grade circular PP

Cycleback Plastics

An innovation by VIVA Energy Australia | CLEANAWAY



Mechanical plastic recycling facility

Cleanaway MRF

Cleanaway CDS sorting facility

Chemical recycling feasibility study

Soft plastics facility
>$200m investment
50kt capacity
>100 jobs
2030 start-up
Cycleback Plastics

Albury PET facility
$58m investment
28kt capacity
45 jobs
Dec 21 commissioning

Melbourne PET facility
$50m investment
28kt capacity
45 jobs
Dec 23 commissioning

Mel. PP and HDPE facility
$38m investment
20kt capacity
43 jobs
Jan 24 commissioning

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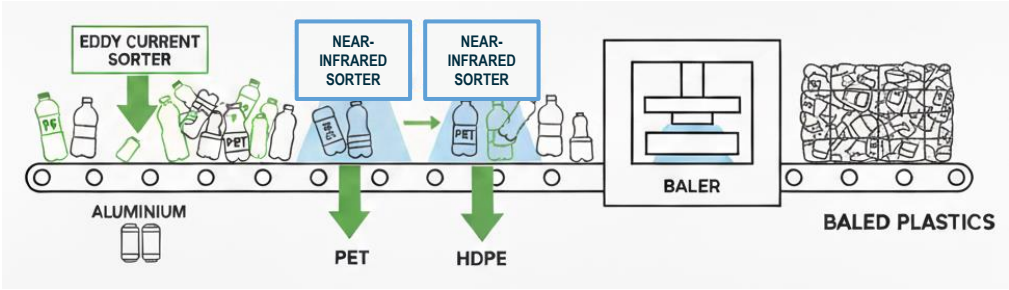
Container Deposit Schemes (CDS)

Together with Tomra, we operate the NSW, VIC (West) and TAS schemes

- Cleanaway has partnered with Tomra, global leaders in reverse vending machines, to deliver CDS in Australia
- We are delivering the NSW scheme since it launched in December 2017 and now also service VIC west region and TAS
- Over 14 billion containers returned in NSW through TOMRA Cleanaway
- Dedicated resource recovery facilities established producing commodity of exceptionally high quality



Delivering fully circular, bottle-to-bottle PET solutions

Food grade PET recycling process

- Optical sorting to achieve >95% beverage bottle intake
- Flaking and caustic wash
- Extrusion/pelletising
- Solid State Polymerisation
- Post crystallisation

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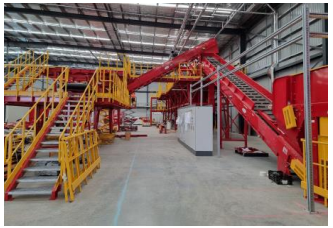
Mechanical recycling rollout through Circular Plastics Australia

Albury PET

$58m investment
28kt capacity
45 jobs
Opened Dec 21

Melbourne PET

$50m investment
28kt capacity
45 jobs
Opened Dec 23



Mel. PP and HDPE

$38m investment
20kt capacity
43 jobs
Opened Jan 24

The food-grade rHDPE process

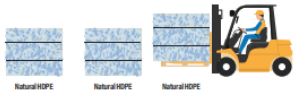
1. Consumers accurately sort their household recyclables into their recycling bins.

2. Kerbside recycling is collected and delivered to a material recovery facility (MRF).

3. At MRFs, recyclables are separated and sorted by material type (paper, glass, metal and plastic).

The separated plastics are moved to the plastics recovery facility (PRF) and sorted into polymer type (PET, HDPE, PP etc) and baled.

4. Pre-sorted Food-Grade HDPE plastic bales arrive at one of Pact's recycling sites.

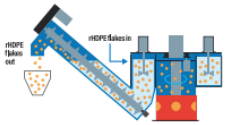


5. Bales are loaded onto the conveyor and undergo an array of near infrared (NIR) optical sorting and other separation technologies to remove any final contamination and incorrect polymer types.

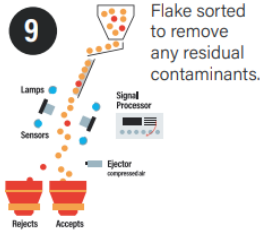
6. Material is shredded to reduce its size.

7. The material is granulated into flake.

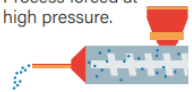
8. Flake is fed into a series of hot caustic washes to sanitise and remove any residual glue and goo.



9. Flake sorted to remove any residual contaminants.

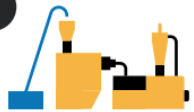


10. Hot Melt Extrusion Process forced at high pressure.



Flake is melted and forced through a fine filter to remove any final contamination before it is extruded and pelletised into resin.

11. The pelletised resin enters the refresher unit and spends > 7 hours deodorising to ensure food contact compliance.



12. The Food-Grade resin is tested for quality against formal specifications. A Certificate of Analysis is issued to the customer for every rFresh-100 batch.

13. Pact uses Food-Grade recycled HDPE resin to make new packaging and products such as milk bottles, juice bottles and other food packaging.

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Cycleback Plastics

An innovation by

VIVA EnergyAustralia | CLEANAWAY

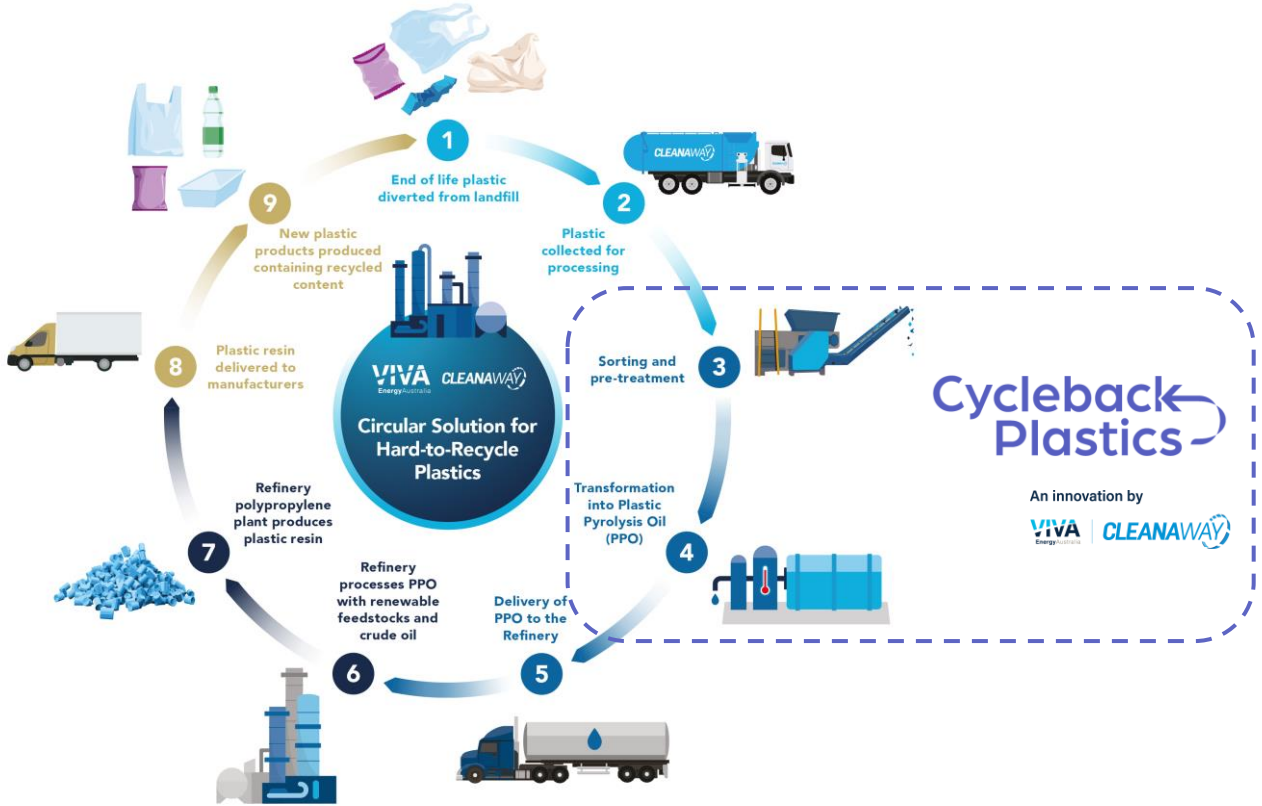
What are soft plastics?

Soft plastics include flexible packaging used for products like food, personal care items and household goods, such as:

- Plastic bags (e.g. food bags for bread, fruit, vegetables)
- Food wrappers (e.g. pasta, rice packaging)
- Plastic film (e.g. cling wrap)
- Plastic pouches (e.g. post bags)
- Bubble wrap
- Packaging for clothing and electronics

They contain multiple materials that are often printed or pigmented, making them generally unsuitable for mechanical recycling.

Overview: A circular solution for hard-to-recycle plastics



Task performed by:

Cleanaway | Viva Energy and Cleanaway | Viva Energy | Other

Cycleback Plastics

Collecting soft plastic feedstock

Municipal – Bag-in-bin

Photo Credit: AFGC

Business-to-business (B2B) - Back of store

Return to store - Collection bin at store front

Photo Credit: SPSA

Cycleback Plastics

Bag-in-bin feedstock collection model

Leveraging existing MRF infrastructure

Residents place bag with soft plastic into kerbside commingled bins

Kerbside commingled bin pick up

Commingled recyclables arrive at MRF

Commingled recyclables loaded onto conveyor

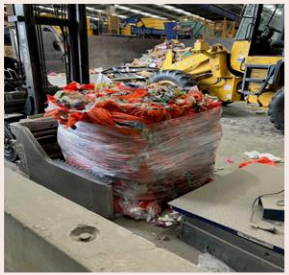
Sorter picks out bags

Sorter to manually pick loose soft plastic if possible

Other commingled recyclables continue to run through MRF process

Baled soft plastic transported for pre-treatment

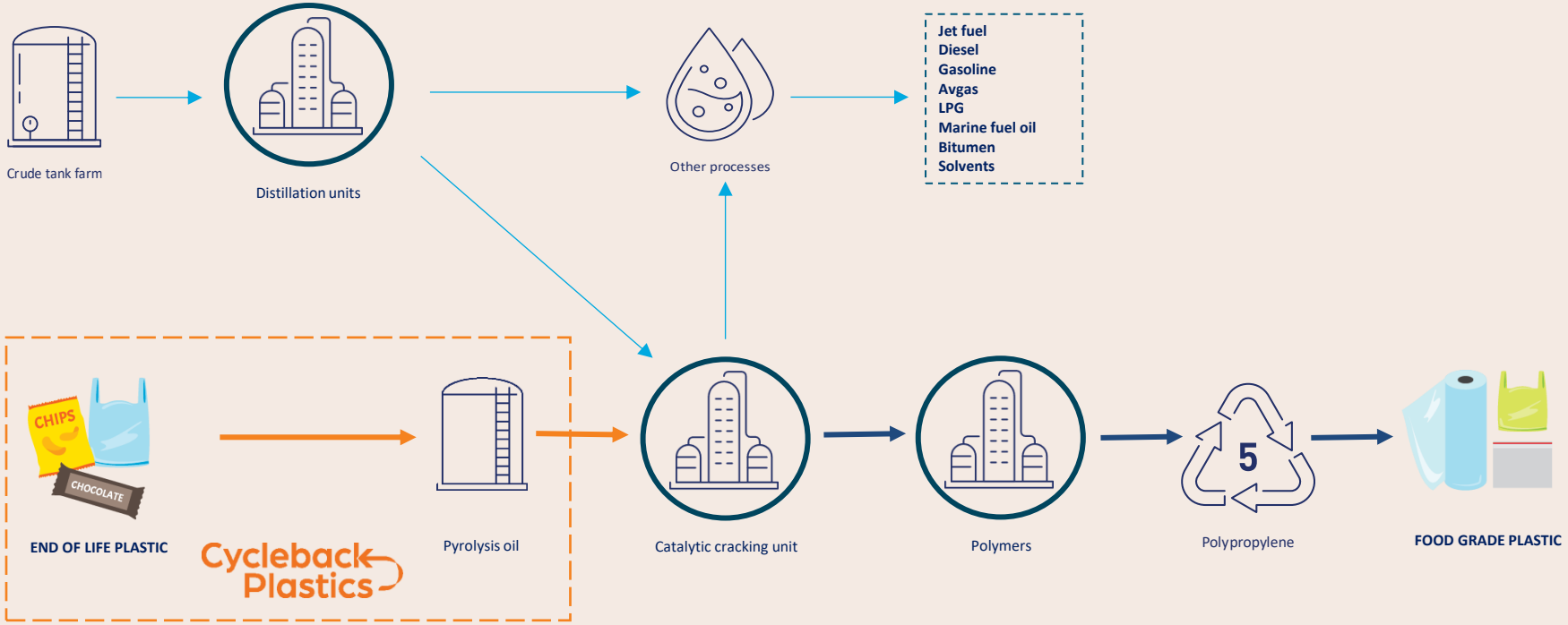
Bags are baled



Sorter drops the bags into bin through chute

Cycleback Plastics

How we produce polypropylene (PP)



Cycleback Plastics

Project schedule & milestones

Cycleback Plastics

2024 and before

- ✓ MoU Viva CWY
- ✓ Feedstock scoping
- ✓ Technology review
- ✓ Preliminary business case
- ✓ Class 4 cost estimate
- ✓ Regulatory approvals review
- ✓ Location review
- ✓ Enabling policies proposed

Pre-feasibility

2025-2026

- ✓ Feedstock validation trials
- ✓ PPO processing trials
- Select owner's engineer
- Technology pre-FEED
- Technology selection
- Location selection
- Regulatory approval submission preparation

Feasibility

2026-2027

- FEED
- Regulatory approvals in place
- Financing in place
- Detailed Design
- Final contracts (shareholder, feedstock, offtake)
- Class 2 cost estimate and schedule

FEED, detailed design & FID

2027-2029

- Modular construction of process equipment
- Site preparation and civil construction
- Assembly of modular units and equipment
- Hiring and training of workforce
- Develop O&M procedures

Construction

2029-2030

- Commissioning and testing
- Complete documentation
- Start-up

Commission & Start-up

2026 look ahead

What happens next year:

- Planning application submission and reviews with referral agencies
- OCG direction on public notification – when technical reports and application is publicly available on OCG website (expecting mid year)
- More community engagement at that time

SRG discussion and suggestions for 2026:

- More deep dive sessions about the technology, and how other facilities with new technology and systems work (Copenhagen, Dublin, other)
- About the emissions and operational facility outputs
- Timing of sessions – Feb / Mar / April?

Next SRG meeting

Next meeting: February 2026 – in person at The Centre, Beaudesert

Topics?

Actions and close

- Summarise actions / topics for future sessions
- Meeting minutes distributed and on website