Greenspot 2845
The Old Wallerawang Power Station

Discussion with Lithgow City Council

22nd February, 2022

GREENSpot

MEETING GOALS

The purpose of this discussion document is to achieve three main goals:

1. Provide a brief holistic update on the **vision for the Old Wallerawang Power Station**. Plans presented are conceptual and illustrative, created to support early and meaningful dialogue opportunities with LCC.
2. Support the facilitation of a **first discussion** with LCC **about Energy from Waste**. Presenting the facts and characteristics of Wallerawang that make it worthy of consideration.
3. **Clarify** the **short term actions** required **to keep an option** available for LCC to consider the merits of EfW in collaboration with stakeholders and the community.

Agenda

- Vision for Wallerawang Power Station
- Key milestones to date
  Honouring heritage while laying solid foundations for the future
- Sustainable Energy Investments
  Discussion of current potential options available to Wallerawang site
- Discussion

Ultimate Success for Greenspot

Play a meaningful part in the transition to a circular, sustainable energy economy in Lithgow and the Central-West

Respect heritage while helping to create a sustainable future

Respect

We are excited about the future. But never at the expense of the past.

Rethink

Where others decommission, deprioritise or disregard, we reimagine, re-energise and rethink.

Regenerate

We aim to create a bright spot that attracts partners, visitors and employers beyond the site itself.

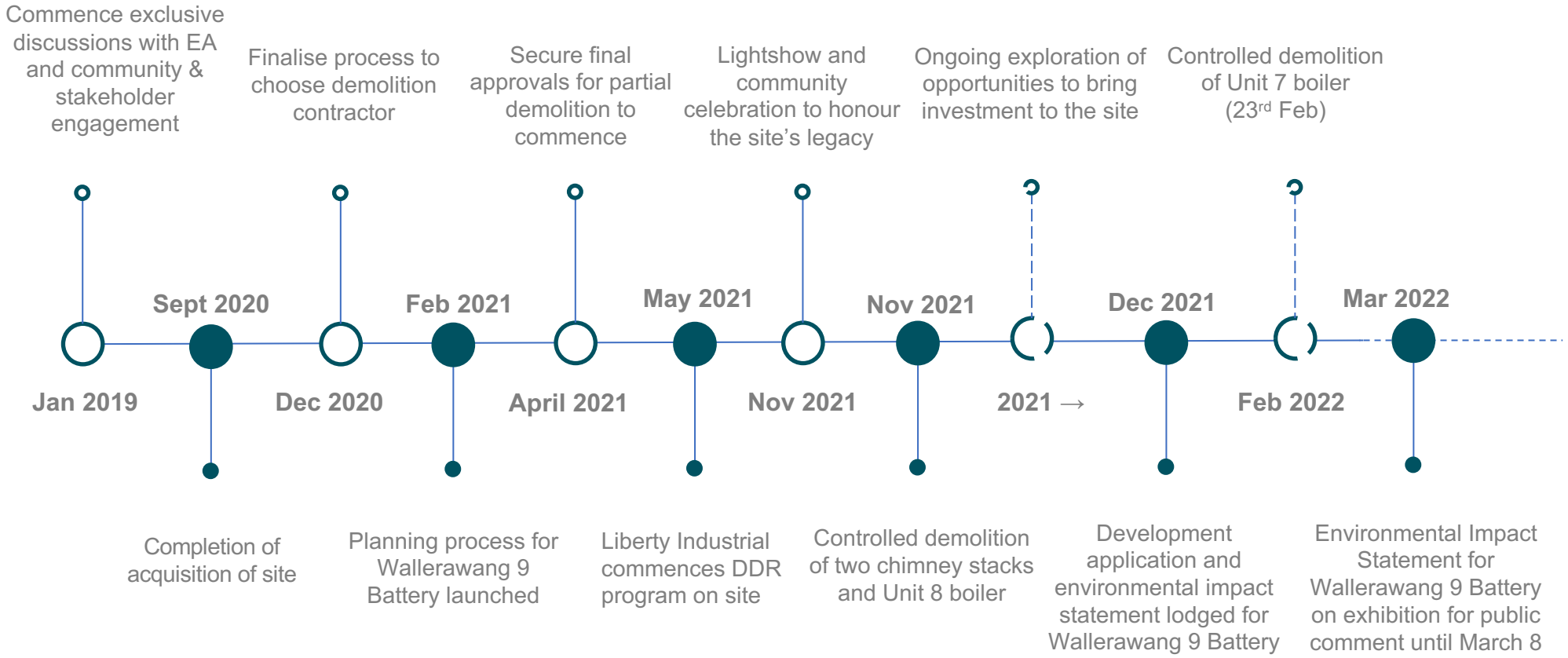
We're starting with Wallerawang.

GREENSpot

Wallerawang Vision

Co-create a vibrant world-class precinct which reinstates the site as the heartbeat of the local community

Key milestones to date:



Working Towards a New Chapter

Respect, Rethink, Regenerate: Looking towards new chapters

Respect: Community events honour the site's legacy

Rethink: Ongoing DDR creates jobs & prepares the site for the future

Regenerate: Working with partners to generate activity and highlight great places in the region

Rethink: Phased and controlled demolition

Regenerate: Development application lodged for the Wallerawang 9 Battery

The Sydney Morning Herald · The Guardian · ABC · Lithgow Mercury

Rethink: media coverage and positive response to the next chapter for Wallerawang exceeded expectations

Positive community interest

This is a fantastic thing to do. It is so good to see companies making communities inclusive and respecting the history whilst focusing on the future.
Well done Greenspot!

Love Reply Hide 13w

6

Thank you for your sensitivity to the local community who have had many family members work on that site and for capturing the moment for future generations to come.
Amazing job! 👏

Please don't pull down the big cooling tower!

Like Reply Hide 50w

4

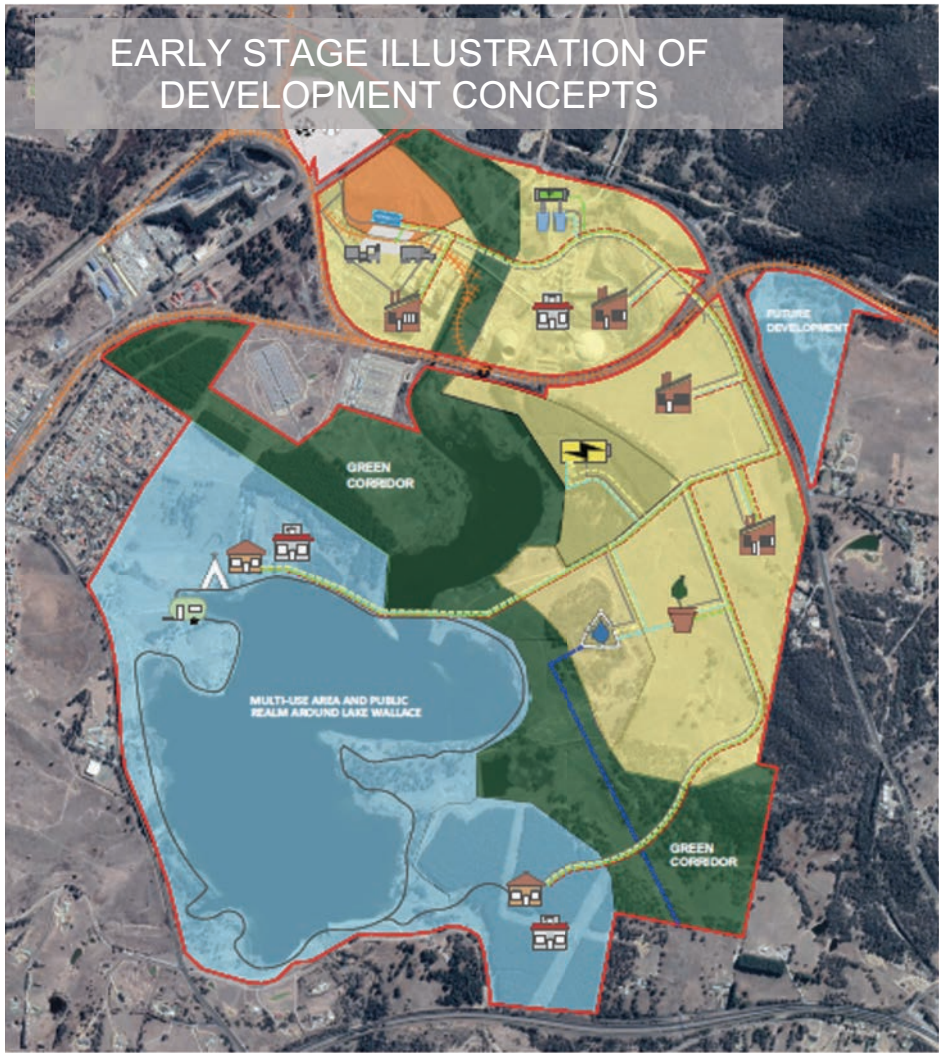
My father helped build those stacks .

Like Reply Hide 12w

GREENSpot

Wallerawang Vision: *A vibrant world-class precinct*

- **Core enablers:** Energy, water, transport and digital infrastructure
- **Investment approach** continues legacy of power generation and leverages existing infrastructure & local talent
- 2 major projects at the right scale will ***accelerate*** broader faster progress
  - Pulls forward sustainable job opportunities
  - ***Attracts over $1billion of capital investment*** over 4-5 yrs
  - Creates **opportunity to accelerate delivery of public benefits** and amenities including Lake Wallace as a priority tourism destination



EfW – *time sensitive moment to keep an option alive*

- EfW Infrastructure Plan **released Sept 2021** by NSW State Government. We are seeking clarification about whether Wallerawang is a supported site.
- Not in original Greenspot plans but **now better understood** as a safe, viable opportunity deserving of careful consideration for the local economy and community.
- We have access to **world class partners** with demonstrated capabilities and access to best-in-class technologies deployed successfully around the world.
- We will not compromise on **commitment to positive outcomes** for the community and environment.
- In any scenario an EfW facility would **not take up more than ~ 1.5% of the total site.**
- **Two major projects** in 2022 will accelerate the broader site development progress & unlock further investment potential in the area.
- Meaningful opportunity for Greenspot, LCC to **collaborate, work together with the community and demonstrate success.**

EfW – *time sensitive moment to keep an option alive*

The following pages outline the following

1. **Early stage feasibility work** done by Cleanaway and Macquarie to explore the viability of EfW as a sustainable and reliable energy source at Wallerawang Power Station.
2. **Illustrative approach** to an EfW investment at Wallerawang.
3. **Presentation of facts and global standard examples of EfW** from around the world

Transitioning Wallerawang to a circular, sustainable energy economy

Background briefing document on Energy from Waste

February 2022

CLEANAWAY MACQUARIE

Opportunity at the Old Wallerawang Power Station

Repurposing a **former coal-fired power station** whilst activating the precinct with **investment, green energy, jobs and rail accessibility**

900 direct and up to 1,200 indirect jobs created over 3-years of construction and over 100 construction roles for associated waste management and resource recovery projects.

50 highly skilled local jobs will be created during operation ~100 roles needed for supporting developments.

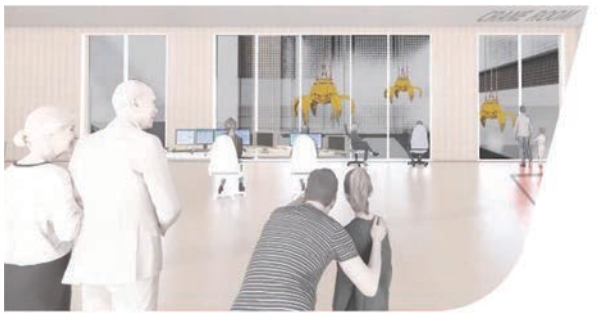
500,000 tpa of waste diverted from landfill. Currently over 2m tpa of residual waste is sent to landfill from Sydney each year. Landfills are filling up quickly. Majority of **waste transported by rail** to the site

~390,000 tonnes of CO2e avoided equivalent to 85,000 cars off the road each year when compared to landfill.

Produce 55 megawatts of base load electricity, enough to power more than 79,000 homes and businesses in the surrounding areas

Over $700m investment, providing jobs, and enabling a cheaper waste disposal alternative to landfill for Councils & businesses.

Community-facing Centre with world-class educational facilities. An on-site Visitor and Education Centre to help educate the community on waste reduction, circular economy, best practice recycling and energy-from-waste.



CLEANAWAY MACQUARIE

Circular economy and sustainable energy business precinct

Potential Circular Economy Projects

CATALYST

Project	Construction Jobs Direct / Indirect	Operational Roles	Investment
EfW Facility	900 / 1200	50	~$700m
Rail Intermodal / Unloader	40 / 20	10	~$40m
IBA Treatment Facility	20 / 10	10	~$30m
FGTr Treatment Facility	20 / 10	10	~$5m
Metals Recovery Facility	20 / 10	5	~$5m
Total	**1000 / 1250[1]**	**85**	**$780m**

Sustainable Energy Business Precinct – Projects directly linked to EfW facility

Project	Description	Operational Roles	Investment
Hydrogen Rail Refuelling Facility	Hydrogen production to support major rail services	15	~$10m
Hydrogen electrolyser – hydrogen production	Green hydrogen via green power generated from energy from waste facility	15	~$40m
Protected Cropping	Offtake of energy, heating and CO2 for 20 – 40 ha of protected cropping glasshouses	120-220	~$150m-$250m
Advanced Manufacturing and other supported industry	Affordable, reliable power for industry on site as part of embedded network	500+	~$500m
Rail siding	Developed as a shared siding for both Greenspot precinct activities (e.g. advanced manufacturing, agriculture etc)	10	$15m
Total		**700+**	**~$765m**

[1] Modelling conducted by Rider Levett Bucknell for Western Sydney Energy and Resource Recovery Centre

CLEANAWAY MACQUARIE

Circular Economy and EfW at Wallerawang Power Station – a *Catalyst* for the Precinct

GreenSpot at Wallerawang ***is permissible in the text*** in the new Energy from Waste Infrastructure Plan 2021 and the draft EPA regulation

GreenSpot at Wallerawang ***is not in the map*** in the new Energy from Waste Infrastructure Plan 2021

A Circular Economy and EfW facility at GreenSpot Wallerawang will:

- **repurpose a former thermal electricity generation site**
- **utilise existing energy infrastructure**
- **utilise existing rail infrastructure**
- **provide hundreds of jobs to people in the Lithgow region**
- **provide major private investment for the region**
- **Use worlds best-practice technology to ensure emissions meet & exceed world best practice**
- **Provide base load power to homes and businesses in the surrounding areas**
- **Act as a catalyst for the entire Greenspot precinct**
- **Divert >95% of residual waste from landfill**
- **Net reduction ~390,000 tonnes of CO2e**
- **investment over $700m in the local area**
- **Comply with NSW EfW Policy & Draft EfW Regulation**

1. The existing facilities in the **West Lithgow/Wallerawang precinct** and associated infrastructure will be able to service Greater Sydney and surrounds and utilise existing energy and transport infrastructure and will provide regional jobs and economic growth to Lithgow.

Source: Energy from Waste Infrastructure Plan 2021

CLEANAWAY MACQUARIE

Development Partners & Investors – bring *Project certainty*

Australia's leading waste management company working hard to make a sustainable future possible for all.

Delivering essential infrastructure to support a circular economy.

Demonstrated experience in delivering regional and urban resource recovery and waste infrastructure.

Feedstock security through Cleanaway's Sydney Resource Network.

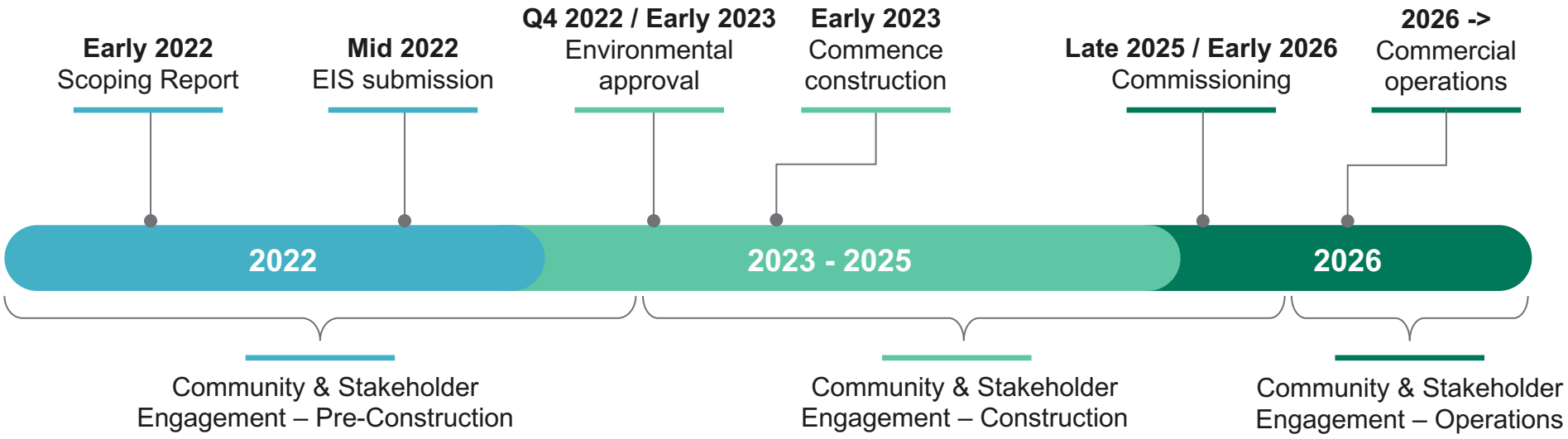
A leading equity investor and sponsor in global renewable energy assets, with deep experience developing energy-from-waste projects, through its Green Investment Group.

Delivering Australia's first thermal energy-from-waste project, Avertas Energy in Western Australia.

Demonstrated experience of developing over 35 operational EfW Projects worldwide.

Indicative Project Timeline

Considering project approvals and construction, first waste acceptance and power generation is expected in 2026 when the centre commences commissioning.



Jobs				
The Site	**Construction > 1500**	→	**Operation ~50**
Related Developments	**Construction > 150**	→	**Operation ~35**

The approval process is rigorous and requires that the Project meets and exceeds global best practice

- The project would be classified a **State Significant Development** (SSD) and submitted for assessment to the Department of Planning, Industry & Environment (DPIE)
- Consultation is required with Community & Stakeholders throughout as part of the process
- DPIE works closely with the **Environment Protection Authority (EPA)** and **NSW Health** in its assessment of air quality and human health
- DPIE **engage independent experts** in energy from waste technology; air quality; and human health risk to assess EfW Projects
- All comments received as part of the exhibition stage **are required to be addressed and responded to** by the proponent publicly
- The Project will be assessed and determined by DPIE or the Independent Planning Commission (IPC) on a **merits-based assessment**

Early Consultation

Prior to lodging a development application (DA) for an SSD project, the applicant must consult with the Department. Following consultation, the Planning Secretary will issue the environmental assessment requirements (SEARs) for the project.

The SEARs will identify the information that must be included in the Environmental Impact Statement (EIS) for the project and the community engagement that must be undertaken.

Respond to Submissions

After exhibition, the Department will publish all submissions and ask the applicant to prepare a Submissions Report.

The purpose of the Submissions Report is to give the applicant a chance to respond to the issues raised in submissions and help the consent authority evaluate the merits of the DA.

Prepare EIS

The applicant must prepare the EIS in accordance with the SEARs.

The purpose of the EIS is to assess the economic, environmental and social impacts o the project and help the community, government agencies and the consent authority to make informed submissions or decisions on the merits of the project.

Assess DA

After publishing the submissions Report, the Department will assess the merits and the DA in accordance and prepare an Assessment Report.

This may include further community engagement, requesting additional information from the applicant, seeking advice from Government agencies and independent experts and preparing recommended conditions of consent.

Exhibit DA

All SSD Das must be exhibited for at least 28 days

This acknowledges the importance of community participation in the SSD process and gives the community a right to have a say on these projects before a final decision is made.

Determine DA

The Independent Planning Commission or a delegate of the Minister for Planning will be consent authority for the DA.

They must evaluate the merits of the DA against the matters in Section 4.15 of the EP&A Act and may approve the DA (subject to modifications or conditions) or refuse it.

Denotes key Council engagement in this stage

CLEANAWAY MACQUARIE

Meeting the objectives of Government

EfW at Wallerawang

- Utilise former thermal electricity generation site
- Site **away from high density residential** area
- **Direct rail connection** to the site
- Worlds **best-practice technology**
- Emissions **meet & exceed** world best practice
- **900 direct jobs** during 3 yrs of construction
- **1,200 indirect jobs** during 3 yrs of construction
- **85 full time** operational jobs for the community
- **~55 MW** of base load power
- **Offtake opportunities** for local power & steam
- **Catalyst** for the Greenspot precinct
- **>95% diversion from landfill**
- **390,000 tonnes** of CO2e avoided (vs landfill)
- Investment of **over $700m**
- **Compliance** with EfW Policy & Draft Regulation

Source: Energy from Waste Infrastructure Plan - September 2021

Comments, questions, next steps

In a nutshell:

- ***Shared purpose***
- *Commitment to **collaborate***
- *Commercially **feasible***
- ***Accelerates** plans for jobs, industry transition and tourism*

Discussion

- **Feedback** on Greenspot's approach and overarching vision for Wallerawang site
- Agree to ongoing **collaborative engagement**
- Consider a united approach to **keep an *option* alive for investment in EfW:** Specifically get Wallerawang Power Station formally included on the EfW map rather than the current position of being included in the text to the legislation but not specifically on the representative map.

FURTHER INFORMATION AND CASE STUDIES

CLEANAWAY MACQUARIE

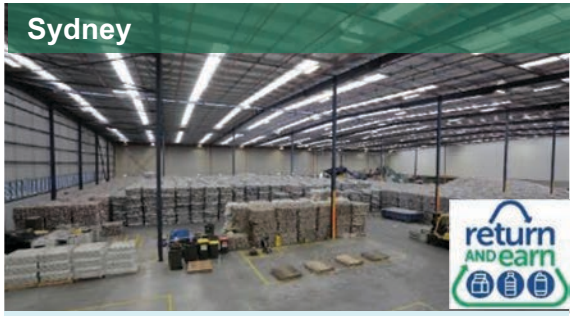
Cleanaway Footprint 2025 Strategy – Investing in the circular economy

In the last four years we have invested heavily in advanced infrastructure to increase resource recovery rates and meet waste management requirements for the circular economy.

Recycling

2019: Materials recovery facilities in Melbourne and Tasmania are revitalising the recycling market

Sydney



2018: New sorting and recycling facility in Eastern Creek

Sydney

2018: New 150kt traditional waste transfer facility with cutting edge sorting technology

Albury

2021: Construction of a new 28ktpa PET recycling facility in Albury

Organics

2019: State-of-the-art organics facility in Melbourne to sort, decontaminate and shred 100kt of 'FOGO'

Energy Recovery

Sydney

2018: New advanced resource recovery in Wetherill Park turning 250kt of waste into a process engineered fuel to substitute coal

Macquarie Capital has significant global expertise

Macquarie Capital through its Green Investment Group has invested in over 30 waste and bioenergy projects, including Avertas Energy, the first to commence construction in Australia.

Avertas, Perth, energy-from-waste

Covanta, Dublin, energy-from-waste

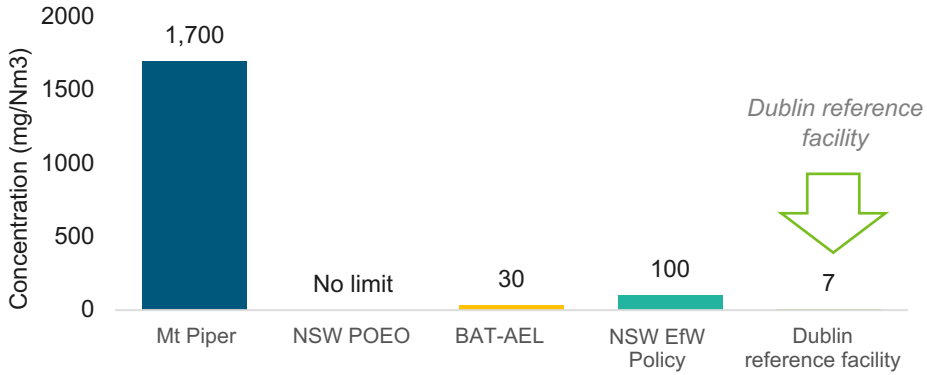
Selected projects	MW	Transaction Type	Client/Partner
Avertas energy-from-waste	36	Development	DIF, VEOLIA, acciona
Protos energy-from-waste	49	Equity	COVANTA, Biffa
Newhurst energy-from-waste	42	Equity	COVANTA, Biffa
Rookery energy-from-waste	60	Equity	COVANTA, VEOLIA
Earls Gate energy-from-waste	21	Development	brockwell energy, COVANTA
Dublin energy-from-waste	60	Equity	COVANTA
MGT Teesside	299	Development	MGT POWER, pka, aip, SAMSUNG C&T, tj
Tilbury Green Power	40	Development	ESB, BWSC, AET
Belfast energy-from-waste	15	Equity	RiverRidge, equitix, P3P, SOUYGUES
Ferrybridge Multifuel 2	68	Debt	Wheelabrator, SSE
Kemsley	50	Debt	Wheelabrator, CNIM
Cramlington	28	Equity	John Laing, ESTOVER, BWSC
Derbyshire	14	Debt	Interserve, Shanks
Evermore Biomass	16	Equity	Foresight, BWSC
TOTAL (across all projects)			

CLEANAWAY MACQUARIE

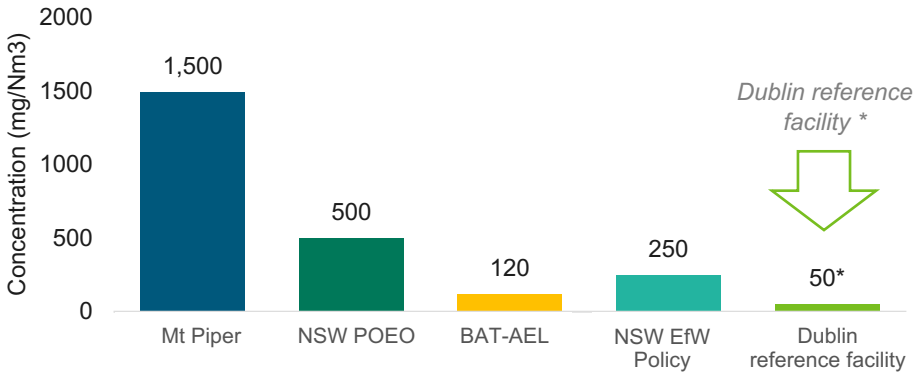
Air Emissions – Our reference site is global best practice.

Air emissions will meet & exceed world best practice. Air emissions must always comply with the NSW EfW policy limits and apply international best practice techniques to minimise emissions as far as feasible

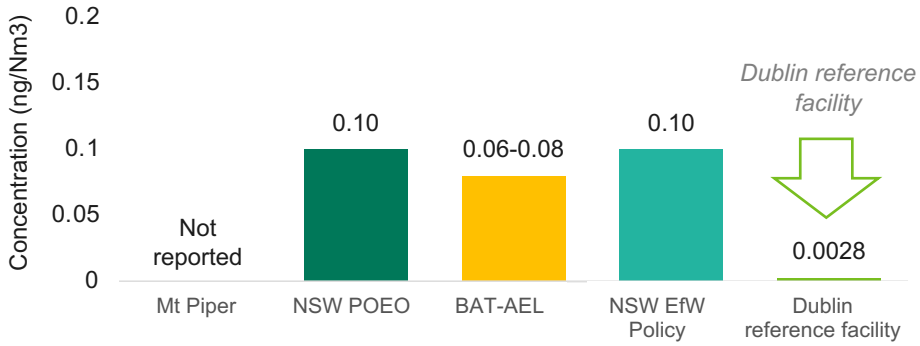
Sulphur dioxide (SO_2)



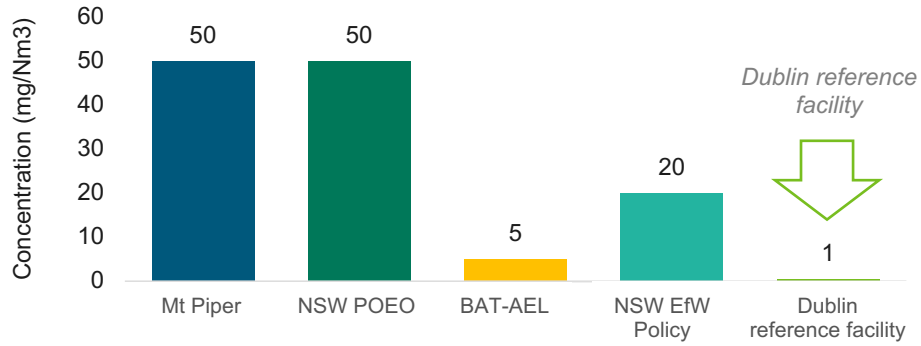
Nitrogen dioxide (NO_2)



Dioxins & Furans, TEQ



Particulate matter (PM)



Legend

- Mt Piper Power station Limits
- NSW POEO [1]
  POEO: Protection of the Environment Operations Act 1997
- BAT-AEL [2]
  BAT-AEL: best available techniques associated emission levels
- NSW EfW Policy
- EfW Reference facility – Dublin plant (Covanta)

[1] 1-hour average limits (for electricity production >30MW, using solid fuel) [2] 24-hour average levels
* Dublin will achieve 50mg/Nm^3 with new SCR technology currently being installed

CLEANAWAY MACQUARIE

EfW and Odour: the facts

- EfW facilities **do not generate external odour**
- The receival hall is under **negative pressure** with **fast closing automated doors**.
- Air from the receival hall is used in the combustion process and **odours are destroyed**
- Waste deliveries will be in enclosed rail containers to ensure no odour
- An example is Cleanaway's Erskine Park facility which operates under negative pressure with doors to the facility only opening when a truck is ready to make a delivery, similar to how the EfW facility will operate

Cleanaway's Erskine Park Resource Recovery & Transfer Station

Transport – Rail Haulage

- Majority of waste will be delivered to the site **via rail connection** to the main Western Line
- Some **local and close-proximity waste** may be delivered by trucks (expected less than 10%)
- **One (1) rail delivery per day only** with minimal impact to stakeholders (currently Centennial Coal has the ability to make 6 movements per day from Wallerawang siding)
- **Intermodal terminal** and multiple-track sidings proposed to be constructed on the site with direct connection to the main Western line
- Rail spur will **further enable access** to the remainder of the GreenSpot precinct for further rail-centred activities
- **Sealed, leak-proof containers** for transporting waste via rail

Sealed containers for waste transport

Rail Haulage to site (~90% of waste deliveries)

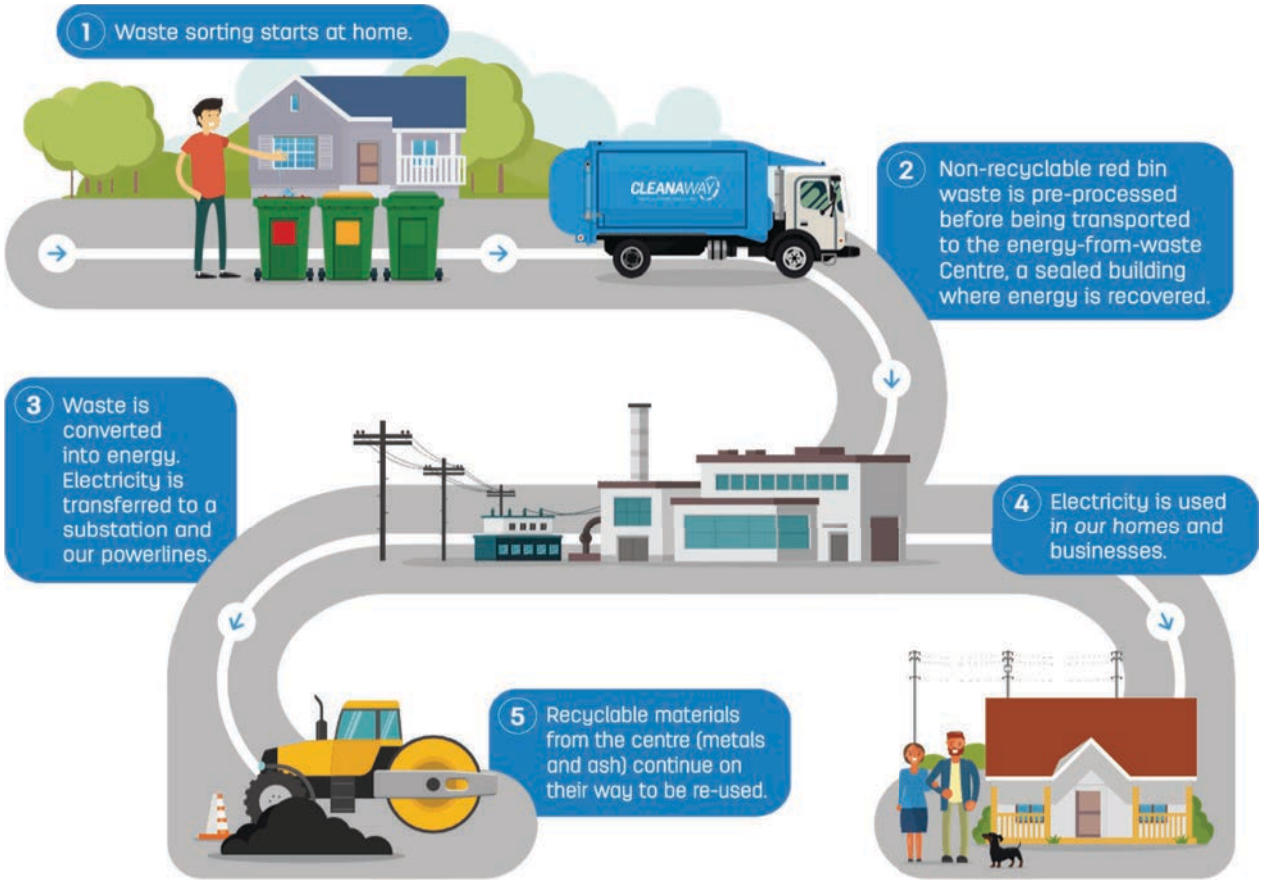
Cleanaway Transfer Trailer (~10% of waste deliveries)

Social Licence – Engagement Strategy & Collateral

Engagement Strategy

- **Doorknocking** at announcement stage and out-reach to wide range of groups
- **Collateral information** including case studies, fact sheets, detailed project brochure
- **Stakeholder briefings**
- **Project website** with video tools, long FAQ, interactive question and answer format and regular updates
- Large deliberative **project start up workshop**
- **Pop up information stalls** at local shopping centres
- **Recruited Citizens Panel** to examine air and health methodologies
- **Interviews with people who live near energy from waste facilities** in other countries

Collateral Examples



Social Licence – Community investment considerations

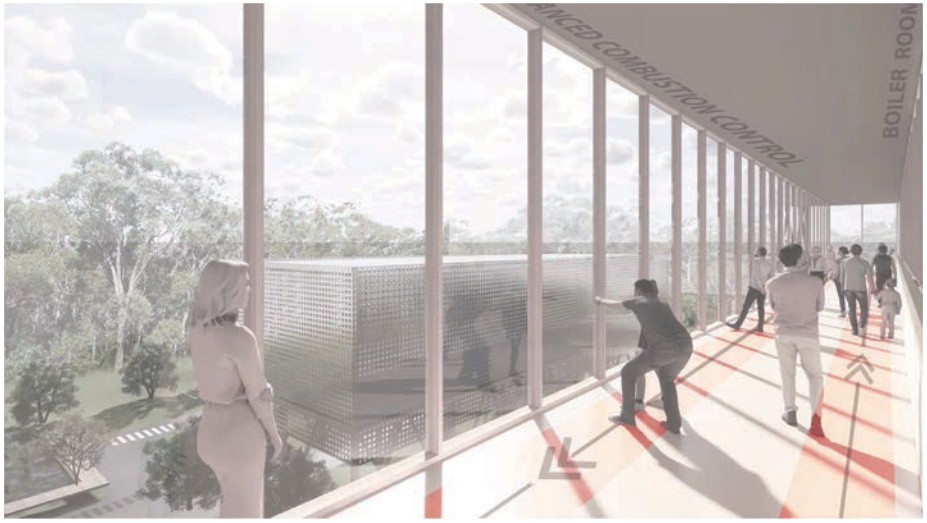
A community investment package will be developed to give back to the local community hosting the project. The framework will be finalised, with input from the community and the establishment of a Community Reference Group

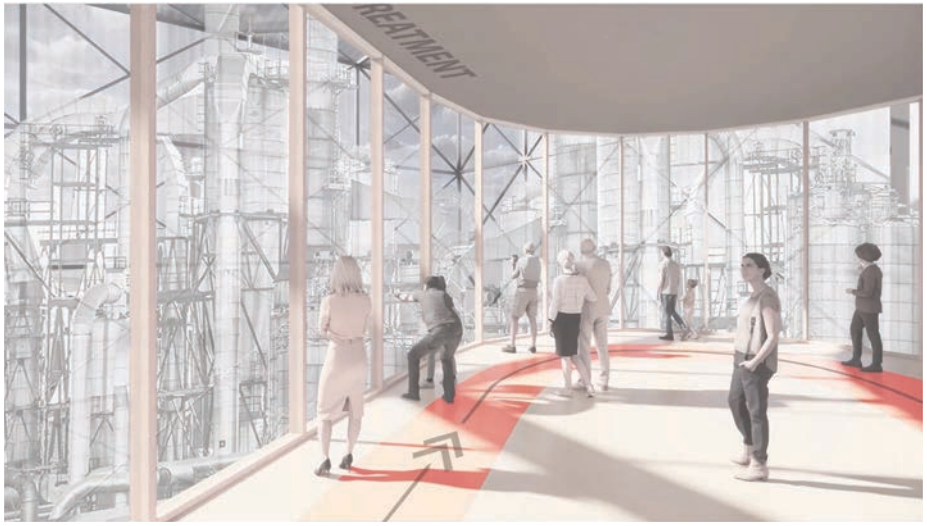
- Tree planting will be proposed for use as screening from the highway and the revitalisation of existing bushland areas. Potential for ideas such as ‘green walls’
- Native plantings to expand the bushland corridor and surrounding areas such as Lake Wallace

- Community funding program to invest in key environmental and social projects, for example sporting and recreation facilities, lighting, water protection etc.
- Potential savings on electricity bills for residents within 2km of the project

- Dedicated education and visitor centre on site to promote the circular economy, recycling and resource recovery and the contribution of energy from waste
- Community education programs

Visitor and education centre





CLEANAWAY MACQUARIE

Visual Amenity to fit with heritage and surrounds

Reference facilities – Using global benchmarks

Selecting a suitable reference facility was a key consideration

- Potential reference facilities visited in the UK in 2019
- Reference facilities have:
  - **Similar waste mixes** (MSW & C&I) and calorific value
  - **Same technology** including **advanced flue gas treatment** systems
  - Located **close to cities** and are taking cities' waste
  - Comparable size
  - Good community outreach programs and ongoing **community investment and education**

Filborna EfW

Dublin EfW (Macquarie has a stake in this project)

Case Study – Earls Gate EfW

Co-located heat and power in industrial park

Macquarie Capital | Green Investment Group (GIG) jointly developed the Earls Gate EfW plant, investing 25% of the equity and leading the debt raising process for the Sponsor group

- 216,000 tpa Combined Heat and Power plant located on the Earls Gate industrial park in Grangemouth, Scotland
- Heat and power connection arrangements with the EfW facility connecting into an existing supply network
- The project will provide steam and electricity to businesses located in the Earls Gate industrial park via the estates services provider with surplus electricity exported to the grid
- Provided via conventional moving grate EfW and 30 MWh of gas fired backup boilers

23.7MW
Gross electrical capacity

29%
Net Electrical Efficiency (Power Only)

20%
of Scottish residual waste processed

£175m
Capex

Financial close	December 2018
Construction period	~3 years
Expected completion	Late 2022
Waste throughput	216,000 tonnes per annum
Electricity output	21.5 MW (net)
Useful life of asset	≥ 30 years

CLEANAWAY MACQUARIE

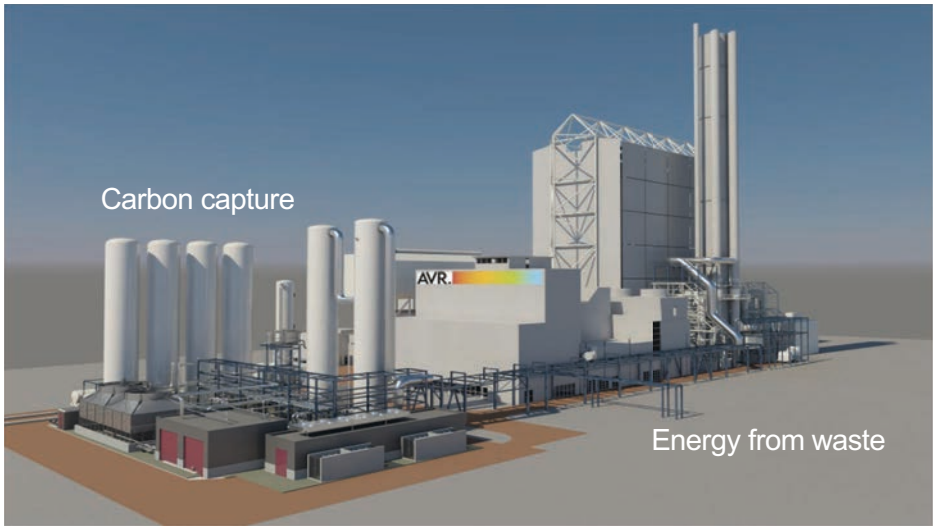
Case Study – Duiven EfW

CO_2 captured and purified for greenhouses

AVR, the largest waste management company in the Netherlands, is operating an EfW facility in Duiven, Netherlands that will use CO_2 capture and storage for export to greenhouses

- Air Liquide and AVR signed an agreement to recover and distribute CO_2 captured from the plant:
  - 60,000 tonnes of CO_2 (15% of total CO_2 emissions) will be captured, purified and liquefied for export
  - Carbon capture is performed through amine scrubbing stripping to provide pure CO_2 gas
  - The CO_2 is cleaned and compressed, before it is transferred to tank truck filling stations and directly exported to local and regional greenhouses
- AVR estimates a future annual CO_2 export of 800,000 tonnes of CO_2 in the Netherlands
- Supply of heating to the greenhouses as an additional benefit is currently being explored

Operational start date	1990
Waste throughput	360,000 tonnes per annum
Electricity output **Heat output**	147 GWh (net) per annum Heat export 164 GWh per annum
CO_2 captured for export	60,000 tonnes per annum
Expected operational life	>2035



CLEANAWAY MACQUARIE