

WMRR 2023 ENERGY FROM WASTE PRESENTATION - THURSDAY 2 NOVEMBER 2023

SLIDE 1 – Introduction

- 1. ["Good morning, thanks" and any comments on the preceding presentation from Andy Street, Founding Director SLR Consulting.]
- 2. It's a great pleasure to contribute to this conference and its theme of "Energy from Waste The missing piece in Australia's sustainable future".
- 3. Before I begin, let me acknowledge the Gadigal of the Eora Nation, the traditional custodians of this land and pay my respects to the Elders both past, present and emerging.
- Firstly, I'd like to share a little about me.
- For those who don't know me, I'm a chemical engineer.
- After graduating from Sydney University in 1996, I started my career at Shell where I spent 18 years and loved every minute.
- The highlight of my time at Shell was to lead the Geelong Refinery team as the last ever Shell Refinery Manager. I'm proud that that site and team operates the last of only 2 refineries in Australia.
- Following that, I joined Origin Energy where I had the privilege of leading the development of Queensland's abundant natural gas resources for the domestic and export markets.
- Why am I telling you this, well because when I left Shell and Origin Energy, I never thought I would operate another refinery or drill another well. How wrong could I be, where at Cleanaway we do both.
- Oil and gas and modern waste management have more in common than might initially be thought let me explain.

SLIDE 2 – Cleanaway overview

- Cleanaway's business model has been based on mobile assets, with a fleet of around 5,900 trucks that serve 130 local councils and more than 150,000 industrial and business customers.
- Cleanaway is now transitioning from a wheels business more and more towards fixed infrastructure assets.
- Our strategy is to **integrate and extend our infrastructure** assets together to provide customers with high circularity / low carbon solutions, great customer service and value for money prices.
- We're taking a multi-decade outlook as we expand our resource recovery and recycling infrastructure and at the same time minimise our greenhouse gas emissions by diverting waste from landfill and reduce demand for primary raw materials.

- Let me bring that to life.....
- This means investment in world-class fixed assets such as the state-of-the-art Material Recovery Facilities in South Guildford, Western Australia, and Blacktown, New South Wales.
- It means investment through the acquisition of the composting company Global Renewables to strategically position us in the FOGO market. Another \$40 million will be invested in upgrades over the coming years to be able to process FOGO and to increase the capacity from ~220ktpa to 300 ktpa.
- And in plastics where we have our **Albury pelletising facility** in a joint venture with Asahi Beverages, Coca-Cola and Pact Group which processes NSW CDS materials and our MRFs; And with the same partners we are commissioning the **sister plant in Altona**. And in Laverton we have a **joint venture with Pact for the HDPE/PP equivalent plant** for plastics from the likes of milk bottles, ice cream tubs and shampoo bottles. This means that if we pick up your comingled bin in Melbourne then its contents will become food grade and other pellets. When commissioning is complete those **3 plants will represent a \$150m investment in plastics**.
- Our commitment to high-circularity and low-carbon solutions also means development of energy from waste facilities in Victoria, Queensland and New South Wales with an **investment of up to \$1 billion per facility** including related infrastructure.
- All of these are very large, fixed assets that will transform our company at the same time as we maintain our laser focus on sustainable customer solutions and operational excellence.
- This brings me back to my background in oil and gas, where operations are based on long-term large scale fixed assets.
- The **vertically integrated model** of mobile collections fleet feeding scale post collections infrastructure that is integrated together for customers in the name of sustainability, we believe will continue to serve our customers all around Australia today and into the future.

SLIDE 3 – Reimagining the waste hierarchy

- Every month, I sit with our new employees, and we have a conversation. The first question I ask them is
 "what is written on the side of our trucks......". They say Cleanaway, 131339, and what I want is...... We
 then walk through what each word means and what are the important words. The last one is a trick
 question 'a' because there is not one way and because the way we do it in the future will be different to
 the past.
- The future being different to the past has led us to think more deeply about the waste hierarchy.
- Waste is no longer seen as having no value, but rather a valuable resource to be recovered, reused or recycled wherever possible.
- This is why Cleanaway has taken the well-known concept of the waste hierarchy and re-imagined it as the Cleanaway circularity hierarchy.
- You will notice '**recycling**' has been broken into **three segments** the first and most desirable being domestic recycling into the same of similar grade products, enabling a domestic circular economy, job creation and a reduced carbon footprint e.g. Our 3 plastics facilities.

- The **second being international circularity**, this is where reprocessed materials are sent overseas to be remanufactured into high end products. Eg the export of high-quality cardboard which is reprocessed into cardboard boxes in overseas facilities.
- The **least desirable is downcycling**, because in the easy example of a plastic bag turning into a park bench, it's just that it provides **one use** and there is nothing wrong with downcycling particularly where technology may not be available or be economic for more circular recycling
- Transitioning from the current linear "take-make-use-and-dispose" model to a truly circular economy will take time.
- In the meantime, at the bottom end of the hierarchy, there are some products that will, for the foreseeable future, require well-engineered and operated landfill capacity such as soils.
- There will always be a need for inert landfill.
- The **last element is energy recovery**. This is an exciting opportunity for various waste streams where recycling is either not technically feasible, economic or environmentally superior.
- Energy from waste provides an opportunity to **capture the embodied energy in residual waste** materials that would otherwise be lost if disposed to landfill.
- This includes energy-rich solid waste material that is not recyclable, including used nappies and coffee cups what's on the lid of your red bin.
- The issue here is that it's **not neither in terms of energy from waste or landfills**, we think it's an 'OR' statement and in some case 'AND'.
- Energy-from-waste presents a **complementary solution to landfill** in providing safe solutions for resources that cannot otherwise be recovered.
- The key driver for this technology is that it provides a genuine choice for customers who want to divert waste from landfill.
- As a society we are consuming ever increasing volumes of resources that end up in our waste streams. The National Waste Report 2022 showed that waste generation in Australia increased to 76 million tonnes in 2020-21, up two million tonnes in two years. That's a big number. That's the amount we take into MRL in one year.
- And as a lot of you know, EfW and landfills are long lead time projects which means we need to act now to ensure that we match residual waste supply volumes with energy from waste and land fill airspace capacity
- The final point on this slide is the reality that there is limited community support for greenfield putrescible landfills, and it's simply not the best environmental outcome for a number of reasons I will come to shortly.

SLIDE 4 - Cleanaway's renewable energy opportunities

- Excitingly as well as reimagining the waste hierarchy and our role in it, at Cleanaway we are also seeing a rapidly increasing suite of renewable energy opportunities as shown on the slide some of which we participate today and want to grow and some new ones which are actively working on.
- We think these are exciting opportunities which provide exciting opportunities to reduce our own carbon footprint, supply renewable energy streams to existing and new customers and in turn help those customers with their sustainability journey.
- To bring this to life last year we drilled 250 new wells across our landfills and produced 4.3PJ of gas of which 72% was turned into electricity or delivered to 3rd parties for energy. And this is still ramping up!

SLIDE 5 – EfW benefits

- There are numerous economic and environmental benefits of energy from waste.
- Energy from waste is crucial for governments to meet their landfill diversion targets. The Victorian and New South Wales Governments have landfill diversion targets of 80% by 2030 and the Queensland Government 90% diversion by 2050.
- The technology is safe and proven and relative to landfills provides for greenhouse gas savings I'll talk to that more in a moment.
- In addition to carbon savings, energy from waste allows for an estimated **13,000 tonnes** of **recyclable metals recovery** each year from a **400,000-tonne facility**.
- The baseload power generated is a key enabler for precincts. Energy from waste precincts have enormous
 potential to become self-sufficient precincts where energy from waste sits at the centre of a network of
 complementary industries, providing heat and steam, and creating jobs and innovation e.g. a 400kt p.c.
 plant produces 40 MW enough for 60,000 homes!
- There are also job opportunities as communities transition away from coal-fired power plants. Each of our projects will create over 800 jobs during construction and 50 ongoing expert roles during operation. I believe these roles are analogous to many coal power station roles and so a great opportunity to transition those workforces as power stations close over time.

SLIDE 6 - EfW emissions benefits vs landfills

- Energy from waste offers a societal carbon savings benefit over the life of the asset.
- We can **quantify these carbon savings** by comparing **two parallel worlds**: One where 40MW of electricity is generated by EfW, and another where the 40MW of electricity is drawn from the grid and the waste that would have been burned at the EfW plant is sent to a landfill.
- In Victoria, our analysis shows that if **electrons from energy from waste were to displace** the most carbon intensive electron on the grid, energy from waste would deliver approximately **3.1mt CO2e** emissions over the life of the plant.
- This is a **44% emissions saving** between **2028 and 2050**, equivalent to, on average, removing **30,000 cars** from the road per year over the same time frame.

- **Emissions** from energy from waste **can decrease over time** as fossil-fuels-based plastics are removed from the feedstock and additional post-combustion CO2 capture systems are installed.
- **Carbon dioxide emissions** that are captured from energy from waste **could be reduced** by providing carbon dioxide as feedstock for protective cropping, CO2 mineralisation, carbon capture and storage and offset with high-integrity carbon credits.
- Importantly, these **facilities are safe**: facilities in Europe and Japan are often located less than 400 metres from the local community.
- And, of course, energy from waste simply has less of a land footprint and requires no expansion over time. When I say that I mean less than 10ha for an EFW relative to hundreds of hectares for a landfill.

SLIDE 7 - Cleanaway's proposals

- Up and down the waste hierarchy, energy from waste in various shapes and forms can support Australia's energy transition.
- There are hundreds of facilities around the world that use this modern technology in Denmark, Germany, UK, USA, Singapore and Japan that use this modern technology. I visited a number of these over the last few months.
- Cleanaway is in a privileged position to be part of the solution, with an integrated network and the feedstock from our own collections. In addition, we have secure sites in good locations in heavy industrial areas.
- Cleanaway is exploring investments in up to three advanced energy from waste facilities to convert residual residential and commercial waste into energy and potentially heating / cooling.
- These plants represent an important step in improving waste outcomes for Australia.
- Australian Governments recognise energy from waste as part of the solution to waste management.
- Focusing on the east coast Queensland, Victoria and New South Wales all have an energy from waste regulatory framework policies and guidelines.
- In **Queensland** we have purchased a site in the Bromelton State Development area. We chose this location for that very reason. The Bromelton State Development Area is **designated by the Queensland Government as a home to high-impact and difficult-to-locate industries**.
- We investigated over 200 sites and, logistically, Bromleton works. It's just south of Brisbane and west of the Gold Coast.
- Victoria's energy from waste policy includes an initial 1 million tonne per annum cap on all new energyfrom-waste proposals. The projects will be allocated under the cap through an EOI process by Recycling Victoria.
- What is unique about Victoria's cap policy is a meritocracy under which **only the best projects will be awarded an allocation under the cap**.

- Proponents must demonstrate the use of the best technology and a guaranteed feedstock.
- The New South Wales policy has also adopted a requirement that proponents must have a fully operational reference facility to ensure all applications prove the proposed technology meets international best practice. This demonstrates it's the best technology and capable of handling the expected variability and type of waste feedstock.
- New South Wales has taken a different approach to Queensland and Victoria. Energy from waste facilities can only be developed in **designated energy from waste precincts**.
- There is a legislative requirement that the NSW policy must be reviewed before 2025. However, the reality is the current policy is what we must work with today.
- If NSW is to meet its landfill diversion target, the time for investment in energy from waste is now.

SLIDE 8 - Where to from here?

- Where to from here?
- The success of energy from waste projects depends on two things; social licence, and I'll come back to that in a moment; and stable policy.
- Investments require a stable and secure policy environment that provides industry with confidence; that
 provides customers with the confidence to enter agreements that will help to underwrite these projects;
 and investors with the confidence to commit hundreds of millions of dollars upfront without making a
 return for several years. In other words, in a market economy, debt and equity investors need to be
 reassured that their risk-adjusted investment makes commercial sense.
- The scale of investment is a big deal for the waste industry where previously a large investment at a single asset level might be \$100-200 compared to these facilities at around \$1b all in.
- To be blunt, attaching levies and fees to energy from waste facilities would put the development of projects at risk.
- Landfill levies increase the cost of disposal and incentivise and enable the development of resource recovery infrastructure. A tax or levies on top of resource recovery or energy from waste, will increase the cost of resource recovery and place the economic viability of energy from waste as risk.
- I'd like to make the point here that the Victoria Government introduced into Parliament an energy from waste **licencing scheme without consultation** we, and our investors, will be watching this development very closely.
- Simple message is tax what you don't want, incentivise what you do want.
- There are **two things** that **governments can do to support** the cost-effective delivery of energy from waste projects. First, **increase landfill levies** and **harmonise** them throughout Australia. Secondly, ensure that Australia remains a **stable jurisdiction** for investment by **not changing the rules** once an investment is made.
- Moving to social licence...

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- Governments are very conscious of community sentiment. But it is up to **industry to wear the risk** of these projects not the government.
- It is the job of the proponent to bring the **best available and proven residual waste technology** thru reference facilities that the community can see.
- It is the job of the proponent to **take the local community on the journey**, to educate them, to meaningly engage and listen to and address their concerns. Most of all, to be transparent in the community where you need the social licence to operate.
- Energy from waste presents a lot of **social and economic opportunities for local communities**, including **jobs during** construction **and ongoing** jobs including expert roles. We are also exploring **apprenticeships and traineeships** for a variety of roles through partnerships with local training organisations.
- And **EfW is about precincts**, we have to be able to **demonstrate adjacent jobs and benefits** of these facilities **through co-location**. And we see this as Cleanaway facility and 3rd party facilities who benefit from the various streams.
- If we are to realise these benefits, time is not on our side.
- Energy from waste projects require **5 to 7 years from initial design to steady state operations** to develop.
- Which means we have to **plan ahead with governments** so the EfW facilities are ready to commission to match supply of waste with air space availability and EFW capacity.
- Everyone in the value chain needs to work together to get the job done.
- The solution requires all of us *working together* to get this job done.
- It's why in early 2022 added *together* our Cleanaway purpose because we knew we couldn't do it alone. Together with our employees but also together with community, regulators, shareholders and customers
- Our industry is the last to lay its hands on materials that are at the end of their originally intended life.
- This means that we have a special responsibility to help enable and deliver solutions to, for example, reach our national target of **80 per cent average resource recovery by 2030**.
- But we are not alone. All stakeholders in the value chain need to work closely together to be part of the solution.
- Supportive policy plays a pivotal role, creating regulatory stability that encourages investment: taxing what we don't want as a society, and rewarding what we do want.

SLIDE 9 – Q&A

• Any questions?