Environmental Clean Technologies Ltd.

PFAS is the "new asbestos" and the bill is coming due

Share Price: A$0.096

ASX: ECT
Sector: Industrials
9 April 2026

On the 24th of December 2025, Environmental Clean Technologies (ASX:ECT) acquired the patent rights to Flash Joule Heating (FJH) technology for the remediation of PFAS in soil from Rice University. The technology was developed under Professor James Tour, who is widely recognised for pioneering this rapid heating method. ECT intends to deploy FJH to address one of the most significant environmental liabilities emerging globally, PFAS chemicals, a family of roughly 15,000 compounds often described as "forever chemicals" or the "new asbestos" due to their environmental persistence and health concerns.

PFAS spending is surging, but legacy solutions only move the problem

A core challenge in the PFAS remediation market is that spending is rising, while many legacy solutions remain structurally inefficient. In Australia and the United States, governments and industry are spending more than US$10 billion per year on contaminated site remediation, with budgets rising as standards tighten and more sites are identified. In the US, PFAS contamination is estimated to impact around 57,000 sites, while in Australia, approximately 1,700 sites have been identified. Traditional approaches, such as excavation and landfill, and many forms of soil washing, can be capital-intensive and expensive to operate at scale. More importantly, they often do not destroy PFAS. Instead, they relocate the problem or contain it, leaving a long-dated liability that can re-emerge through monitoring costs, compliance risk, and future remediation obligations. Early lab work at Rice University indicates Flash Joule Heating, which underpins ECT's technology, can destroy PFAS, including up to 99.98% removal of PFOA, one of the most prevalent PFAS compounds.

Valuation range of A$0.27 – A$0.34 per share

We valued ECT using a peer-weighted approach anchored to Metallium's market capitalisation of A$445m, implying A$95m or A$0.27 per share in our base case and A$120m or A$0.34 per share in our bull case under normalised market conditions. ECT looks broadly comparable to where Metallium was valued in January 2025, before it re-rated as it moved from strong laboratory testing into early commercial traction. We think ECT is at a similar stage today.

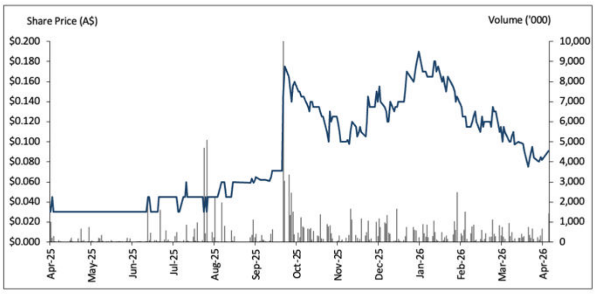
We expect ECT to re-rate over the next 6 to 12 months, supported by positive FJH testing results, technology optimisation, and potential collaborations with industrial machinery companies. This supports our valuation range of A$0.27 to A$0.34 per share. See page 28 for our valuation rationale and page 32 for key risks.

Market cap. (A$m)	36.7
# shares outstanding (m)	358.8
# shares fully diluted (m)	497.2
Market cap ful. Dil. (A$m)	47.73
Free float	86.2%
12 months high/low	0.20/0.03
Average daily volume (x1,000)	511.2
Website	https://ectltd.com.au/

Source: Company, Pitt Street Research

[1] Excluding ELFs

Share price (A$) and avg. daily volume (k, r.h.s.)



Source: Refinitiv Eikon, Pitt Street Research

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Disclosure: Pitt Street Research directors own shares in Environmental Clean Technologies.

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Introducing Environmental Clean Technologies (ASX:ECT)

Environmental Clean Technologies Limited (ASX:ECT) is an Australian-based company founded in 1995 that is developing a portfolio of high-impact and disruptive intellectual property technologies. Over the past two years, the company has undergone a strategic reset, repositioning itself as a technology developer focused on scalable, low-emissions industrial solutions.

ECT's ambition is to build and commercialise innovative patented intellectual property, developing a diversified IP portfolio that can unlock large-scale, cross-industry applications through a licensing-led model. Historically, ECT's core IP has centred on its COLDry platform, a low-emissions industrial processing technology with potential applications across waste-to-energy, slow-release fertilisers, low-emissions iron making, and hydrogen production. These technologies are outlined in more detail in the appendix. While COLDry remains a meaningful component of ECT's broader technology portfolio, the company's strategic focus has shifted following the completion of the Terrajoule acquisition on the 24th of December 2025. This transaction provided ECT with rights to Rice University's Flash Joule Heating supporting PFAS remediation treatments, and now forms the central focus of this report.

Through Terrajoule and a partnership with Rice University, ECT is positioning itself at the forefront of PFAS remediation, targeting one of the most pressing environmental challenges globally. PFAS are a family of synthetic chemicals first developed in the 1930s by 3M and began commercial ramp-up in the 1940s with companies like DuPont. The carbon-fluorine bond in PFAS are defined as some of the strongest organic chemical bonds known, which is why they can persist in environmental settings for up to 1,000 years[1]. These same properties made PFAS commercially useful due to their heat resistance, oil and water repellence and low wear characteristics. However, these properties have also made them exceptionally difficult to remove once released into soil and water systems. A growing body of academic and scientific research has linked PFAS exposure to a range of human health concerns, including elevated cancer risk. As regulatory pressure increases and liability awareness grows, effective remediation methods are becoming increasingly important for governments, corporates, and landowners alike.

The key reasons to look at ECT

1. **There is a clear unmet need in PFAS remediation.** Legacy methods like soil washing and excavation with landfill disposal often fail to destroy PFAS and require heavy upfront capital plus high operating costs per tonne, which quickly absorb government budgets and leave PFAS as a persistent long-term liability. From an operating costs per tonne standpoint, ECT FJH technology is around 25% - 62% more cost-efficient than soil washing and 47% - 84% more cost-efficient than soil removal.
2. **Flash Joule Heating aligns with the direction regulators are pushing.** When applied to PFAS-contaminated materials, it is designed to break the carbon–fluorine bonds and mineralise fluorine into stable, non-toxic calcium fluoride, a natural form of fluorine, supporting durable, long-term remediation outcomes with minimal harmful by-products. This is a crucial outcome for ECT as the possibility for government funding increases with

[1] Duong, C. (2023) 'Trying to solve the "forever problem" of PFAS pollution', *UNSW Newsroom*, 22 March.

treatments that create non-harmful byproducts and actually destroy PFAS (A large unmet need).

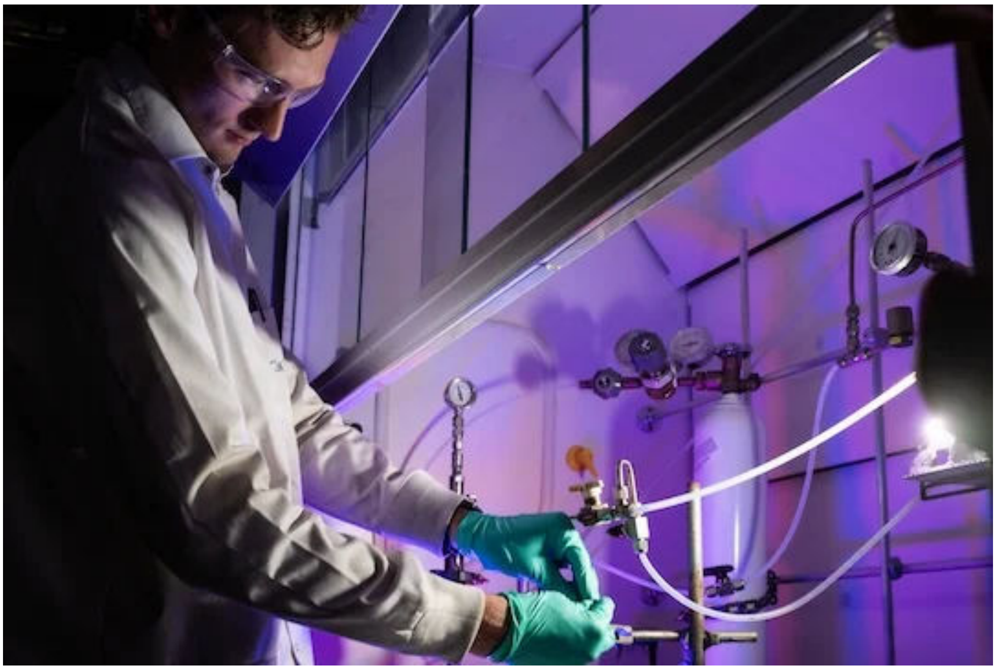
3. **ECT is targeting a large addressable market with forced, not discretionary, demand.** Australia and the US alone are deploying roughly US$10 billion toward PFAS remediation across soil and water systems, with budgets expected to expand further. In the US, Department of Defence spending remains a major driver, with around US$9.3 billion allocated in FY25 as contamination across bases and training grounds continues to be assessed and remediated.
4. **ECT's model can scale without becoming a headcount-heavy remediation contractor.** The company is positioning itself as an IP developer, pursuing licensing partnerships to embed FJH into high-powered systems, including a pilot "remediation tractor," rather than performing remediation directly. If executed, this structure supports a capital-light, high-margin growth profile. Key investor watch points over the next 6 to 18 months include first licensing terms, per-tonne economics, and the calibre of commercial partners.
5. **ECT has credible technical leadership and direct domain expertise.** CTO Justin Sharp previously worked at Rice University alongside James Tour during the development of Flash Joule Heating and also supported Metallium (ASX: MTM) through early integration and validation work. With MTM now a sizable, listed peer at a $602 million market capitalisation, and ECT continuing to collaborate with Rice University while expanding its engineering team, the company has a strong technical foundation to progress FJH from validation toward commercial deployment.
6. **Credibility and network effects via high-profile PFAS leadership.** ECT has added heavyweight advisory credibility through Robert Bilott, a prominent US environmental attorney best known for his decades-long legal action against DuPont over PFAS contamination in West Virginia. His work helped expose the scale of "forever chemical" pollution and drove major settlement outcomes of $1B for impacted communities. Importantly, Bilott's network sits directly within PFAS liability, regulators, and affected stakeholders, creating potential access to real remediation demand and commercial partnerships.
7. **Lewis Utting also sits on the board of Environmental Clean Technologies and runs SciDev**, a useful comparable for ECT. SciDev delivered $103.4 million in revenue and supplies specialty chemicals, plus engineered treatment and dewatering systems into water-intensive end markets like mining, infrastructure, and industrials, including contaminated water streams such as PFAS-impacted water.
8. **Asymmetric upside typical of pre-revenue platform plays.** Pre-revenue companies can be interesting when the prize is large, and the early milestones are binary. For ECT, a credible pilot plus one partner plus one paid deployment can change the valuation framework materially.
9. **In March, ECT expanded its licensing agreement with Rice University to include the right to apply FJH to PFAS-contaminated water systems** through adsorbents, materially expanding its addressable market beyond soil and opening a longer-term growth pathway into the global PFAS water contamination problem.

The origins of the Flash Joule Heating technology

ECT has secured the exclusive Rice University Flash Joule Heating for PFAS remediation in soil patent portfolio led by Professor James Tour.

Investors may already be familiar with Flash Joule Heating through Metallium (ASX: MTM), which has successfully applied the technology to process critical minerals and electronic waste. Early commercial results have validated FJH's ability to break strong chemical and mineral bonds at very high yields, providing real-world proof of concept beyond just the laboratory. ECT's Chief Technology Officer, Justin Sharp, was part of the original research team at Rice University, working under James Tour, the inventor of Flash Joule Heating (Figure 1). That same team supported Metallium during its early proof-of-concept phase[2]. Sharp is now leading the commercial and technical development of FJH for PFAS remediation at Environmental Clean Technologies, creating a clear continuity from academic invention to industrial validation.

Figure 1: Justin Sharp's early work on FJH at Rice University



Source: Rice University

Flash Joule Heating generates ultra-high temperatures in seconds by pulsing current through electrodes.

How FJH works

At its core, FJH is an extreme form of resistive heating that generates ultra-high temperatures in seconds by passing an electric current through a low-resistance pathway. In simple terms, electricity is converted into heat almost instantly because the material's electrical resistance forces energy to dissipate as thermal energy, consistent with Joule's Law[3]. Joules law basically describes that when electric current flows through something with resistance, electrical energy gets turned into heat.

[2] Rice University (2025) *Flash Joule Heating lights up lithium extraction from ores*. Rice News, 2025.
[3] University of Hawaiʻi at Mānoa *Ohm's law, Joule's law, and series–parallel formulas*.

The approach gained mainstream attention after a 2020 breakthrough from James Tour's research group, which demonstrated that graphene could be produced in a matter of seconds by "flash heating" low-cost carbon feedstocks such as coal, tyres, biomass, and plastic waste. Since then, FJH has attracted growing research interest across multiple industrial applications.

Rice University Laboratory testing has validated temperatures upwards of 3,000°C.

Laboratory and pilot work has validated temperatures exceeding 1,000°C within seconds, with peak temperatures demonstrated above 3,000°C. ECT holds licensed rights to apply this Rice University-developed technology to PFAS-contaminated materials, where such temperatures are sufficient to break the exceptionally strong carbon–fluorine bonds that make PFAS so persistent in the environment. Commercially, FJH is most compelling at the most expensive and constrained step in the remediation chain: PFAS destruction. Unlike landfill or immobilisation, which primarily shift contamination elsewhere, FJH is designed to destroy PFAS outright, while also producing a non-toxic byproduct[4].

Figure 2: ECT initial lab testing of FJH with small soil sample size

Source: Company

Rice University Laboratory testing has validated temperatures upwards of 3,000°C.

How efficient is Flash Joule Heating?

Rice University researchers have validated this destruction pathway in a downstream laboratory test by treating PFAS-saturated granular activated carbon (GAC) after PFAS capture in water treatment. GAC is a carbon-based filtration media commonly used to remove PFAS from water[5]. In the experiment, the team loaded GAC with PFAS, mixed the spent carbon with

[4] Ma, X., Zhang, Y., Zhang, X., Wang, J., Peng, W., Cao, Y. and Wang, C. (2025) *A review of flash Joule heating for the sustainable synthesis of graphene: principles, development, and applications in energy storage*.
[5] Heycarbons *Activated Carbon for PFAS Removal*, (Heycarbons Granular Activated Carbon Manufacturer From China).

simple mineralising salts such as sodium and calcium, and then applied a high-voltage electrical pulse using Flash Joule Heating.

Published lab results showed greater than 96% defluorination efficiency and 99.98% removal of PFOA.

Published results showed greater than 96% defluorination efficiency and 99.98% removal of PFOA, one of the most common PFAS compounds[6]. ECT has recently extended its licencing agreement to prioritise this specific GAC pathway. This provides a strong proof point that FJH has been scientifically validated as an effective PFAS destruction method. ECT's core focus is applying the same electrothermal destruction principle to scalable soil remediation, while continuing research collaboration with Rice University on extensions into water treatment applications, which will significantly expand ECT's addressable market.

ECT targets the PFAS pain point

Soil washing is capital-heavy upfront, while excavation simply relocates the liability.

As investors will see throughout this report, legacy PFAS remediation methods are structurally inefficient. Soil washing requires significant upfront capital investment in fixed infrastructure, water treatment systems, and site utilities. Critically, soil washing does not destroy PFAS. It transfers contamination into a liquid phase or concentrated fines stream that must still be treated or disposed of. Excavation and offsite disposal, by contrast, simply relocate PFAS-contaminated material rather than eliminating it. In both cases, costs escalate rapidly, and long-term liability often remains unresolved. The initial commercial opportunity for Flash Joule Heating lies in targeting highly concentrated PFAS streams, where disposal costs are already embedded in remediation budgets. These include PFAS-rich fines, and other concentrated media generated during soil remediation. By focusing on these high-concentration inputs, ECT can address the most expensive and constrained step in the remediation chain without disrupting upstream processes or bearing the costs.

The market opportunities for ECT

The commercial path to making FJH easy to adopt

ECT plans to embed Flash Joule Heating into existing industrial equipment platforms.

Looking more closely at ECT's commercial pathway to take advantage of this opportunity, firstly, the United States and Australia together represent a significant opportunity, with combined government and defence-led PFAS remediation spending exceeding US$10 billion across sectors including defence, aviation, and commercial infrastructure[7]. The revenue opportunity for ECT lies not in competing with existing remediation contractors, but in integrating Flash Joule Heating into established industrial workflows. ECT will utilise electrodes to apply a powerful, short-duration electric pulse that generates extreme temperatures, sufficient to break the strong carbon–fluorine bonds found in both short- and long-chain PFAS[8]. ECT's strategy is to embed FJH into existing industrial machinery through electrode-based electrothermal systems, with a strong focus on improving cost and energy efficiency relative to traditional remediation methods (Figure 3)[9]. This integration-led approach is designed to lower adoption friction while targeting the most expensive and constrained stages of remediation.

[6] Rice University (2025) *Rice scientists pioneer method to tackle "forever chemicals"*. Rice News, 2025.
[7] U.S. Government Accountability Office (GAO) (2025) *Persistent chemicals: DOD needs to provide Congress more information on costs associated with addressing PFAS.*
[8] See page 15 of Environmental Clean Technologies Limited (2025) *Developing a diversified portfolio of high impact & disruptive technologies: Investor presentation* (ASX: ECT), 1 December.
[9] See page 15, Environmental Clean Technologies Limited (2025) for Figure 3: Future workstreams for ECT technology development conceptual schematic.

The company's priority is scaling its engineering capability to design and deliver high-voltage, high-frequency electrothermal systems.

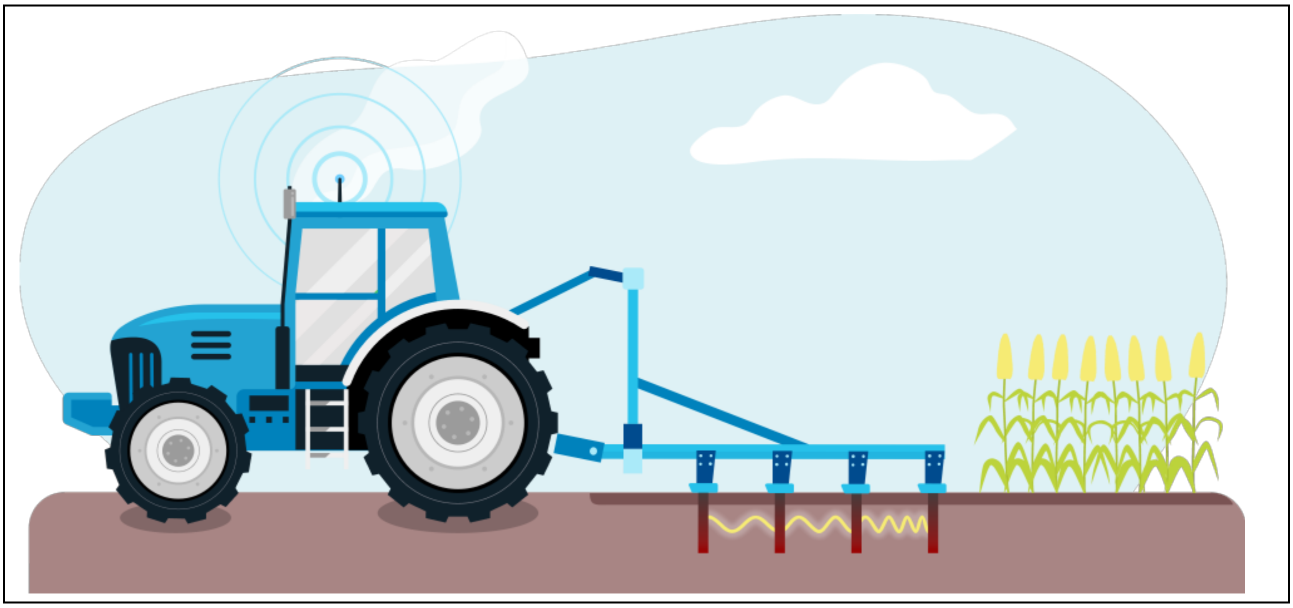
At present, the company is prioritising engineering optimisation rather than rapid deployment. High voltage electrothermal systems must operate reliably under continuous vibration, elevated temperatures, and long duty cycles. These conditions create nontrivial engineering risk and are a key reason ECT has strengthened its technical bench. The company has hired an engineer with dual qualifications in electrical engineering and earth science, combining high voltage, high power electronics expertise with practical insight into subsurface operating environments. The hire's background in high power embedded control systems, including motor drive implementations for permanent magnet synchronous motors (PMSM), is directly relevant because it sits at the intersection of power electronics and real time control. This is the capability required to stabilise pulse delivery, manage switching dynamics, and maintain consistent energy transfer across variable field conditions.

Development efforts are concentrated on three areas: shock absorption, long term electrode durability (degradation), and performance versatility across different soil types and site conditions. Once these milestones are achieved, ECT intends to pursue partnerships with large agricultural and industrial machinery manufacturers to integrate FJH systems into existing platforms. This partnership-led model supports scalable commercialisation by leveraging established manufacturing, distribution, and servicing networks, while retaining a capital-light, licensing-oriented (high-margin) business model.

Flash Joule Heating converts PFAS fluorine into a stable, non toxic byproduct: calcium fluoride.

One of the most important aspects of this process, we believe, is that the destruction of the fluorine bond in PFAS creates a stable, non-toxic calcium fluoride known as (CaF_2). This is a critical distinction for regulators, as it represents permanent destruction rather than containment or relocation, while producing a benign and natural end product that can safely remain in the environment. Importantly, early testing also indicates the treated soil can be revitalised and reused to support plant growth, reducing the need for large-scale excavation, transport, and off-site disposal.

Figure 3: Future workstreams for ECT technology development conceptual schematic



Source: Company

From lab to field, one milestone at a time

Lab testing is currently underway, and ECT is working towards 5 kg of soil treated within 30 minutes.

Based on discussions with management, the company has taken a proactive approach to de-risking commercialisation milestones through ongoing collaboration with Rice University. These partnerships are focused not only on validating research and development outcomes, but also on refining the engineering pathways required to transition Flash Joule Heating from laboratory success to commercial deployment. In parallel, ECT has been expanding its internal engineering capability by recruiting specialists with direct experience in Flash Joule Heating systems and adjacent high-temperature electrothermal applications.

For investors assessing the development timeline of these milestones, ECT's management team has taken a disciplined, milestone-driven approach. To date, the company has validated its electronic Flash Joule Heating systems at laboratory scale, including early field-style testing in flower beds and small garden pits with electrodes inserted directly into soil which was displayed in (Figure 2). Current lab-scale capacity is working towards approximately 5 kg of soil treated in 30 minutes.

The Environmental Protection Agency is allocating up to US$9 billion for PFAS remediation.

Over the next three months, the engineering team is focused on finalising the first commercial iterations of the hardware and associated safety systems. This phase includes stress-testing the electronic systems over hundreds of continuous operating hours to confirm stability, durability, and operational reliability. Following successful validation, the subsequent three to six-month phase will concentrate on pilot development. This stage will assess scalability and focus on integrating the electrothermal FJH system into a mobile unit design, establishing a clear pathway toward field deployment and commercial use.

PFAS cleanup now comes with a cheque

"The final rule policy" is looking to reduce PFAS exposure to ~100 million people.

Alongside the commercial pathway, the second major opportunity for ECT is access to government and defence-linked funding programs. PFAS remediation is no longer treated as a peripheral environmental issue. It has become a funded policy priority across multiple jurisdictions. In the United States, the Environmental Protection Agency is allocating up to US$9 billion under the Bipartisan Infrastructure Law (BIL) to address PFAS and other emerging contaminants in drinking water, delivered through dedicated EPA financing and grant programs[10]. This is arguably the cleanest funding pathway for PFAS remediation because it is not just regulation. It embeds capital investment directly into the policy framework, providing a clearer line of sight from identified contamination to funded remediation activity. "The final rule" will reduce PFAS exposure to ~100 million people, prevent thousands of deaths, and reduce tens of thousands of serious illnesses. The EPA is setting maximum containment levels are 4.0 parts per trillion for PFOA and PFOS, this standard will reduce exposure of these PFAS chemicals in drinking water to the lowest levels that are feasible for effective implementation[11].

ECT is additionally exploring IP pathways with Rice University for specific PFAS contaminated water remediation, which could give the company a dual pathway for possible future funding. The EPA has finalised a rule in the Superfund program designating PFOA and PFOS, two of the most common

[10] United States Environmental Protection Agency (EPA) (2024) 'Biden Harris Administration finalizes first ever national drinking water standard to protect 100M people from PFAS pollution.

[11] See "More details about the final PFAS drinking water standards." United States Environmental Protection Agency (EPA) (2024) 'Biden-Harris Administration finalizes first-evernational drinking water standard to protect 100M people from PFAS pollution', *News releases*, 10 April.

PFAS compounds found in contamination events, as "hazardous substances." This designation is a meaningful catalyst because it can accelerate investigation and clean-up requirements, and it strengthens cost recovery mechanisms that allow remediation costs to be pursued from responsible parties.

In parallel, the United States Department of Defence has materially increased its PFAS remediation commitment over the past decade. Funding has risen from US$2.6 billion in 2017 to estimated investigation and clean-up costs exceeding US$9.3 billion in FY25 and beyond, reinforcing defence sites as one of the most well-funded end markets for remediation technologies[12].

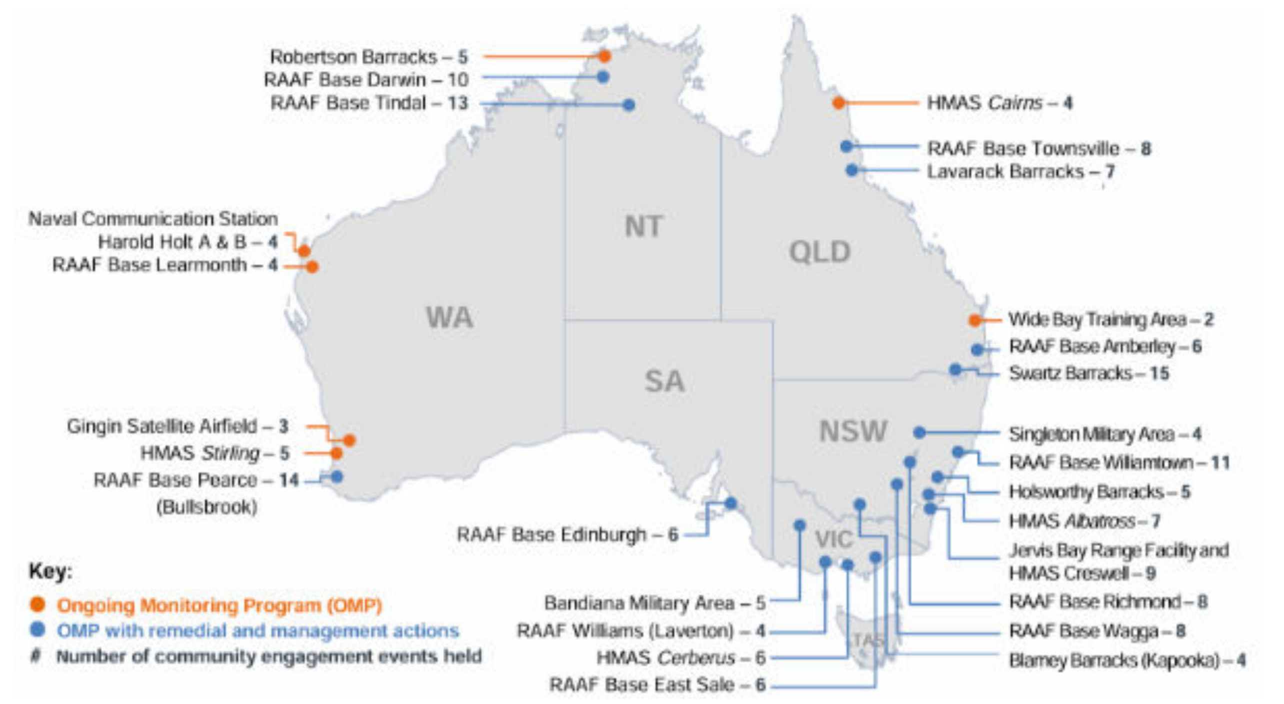
Australia is opening its wallet too

Australia has committed funding, with Defence and firefighting foam impacted sites now a priority for remediation spend.

A similar dynamic is evident in Australia, where funding, program execution and regulation are converging to accelerate remediation activity. A Senate Select Committee chapter on PFAS remediation notes that Defence has invested approximately A$807 million to date, including the removal of an estimated 160,000 tonnes of contaminated soil and the operation of 11 water treatment plants, which have already processed more than 11.5 billion litres of contaminated water[13]. Beyond Defence, a broad pipeline of PFAS monitoring and remediation programs is underway or planned nationally, administered across a mix of Commonwealth and state agencies. Australia's Department of Defence and Airservices Australia manage programs for sites within their jurisdictions, while state environment protection authorities oversee state-led remediation works. In aggregate, there are currently 28 priority PFAS remediation sites across Australia (Figure 4), with eight already under remediation and additional sites expected to enter active clean-up over the next year[14]. Regulatory momentum is also tightening. From 1 July 2025, Australia's national iChEMS framework prohibits the import, manufacture and use of key PFAS chemicals, including PFOS, PFOA and PFHxS[15].

[12] See "Why Gao did this study" U.S. Government Accountability Office (GAO) (2025).
[13] Parliament of Australia, Senate Select Committee on PFAS (per and polyfluoroalkyl substances) (2025) 'Chapter 5: Remediation of PFAS affected sites', *Interim report* (Report, March 2025), Parliament of Australia.
[14] See "Airservices National PFAS Management Program" in Parliament of Australia, Senate Select Committee on PFAS.
[15] NSW Environment Protection Authority (NSW EPA) 'Industrial Chemicals Environmental Management Standard', *NSW EPA.*

Figure 4: Defence PFAS investigation and management programs



Source: Parliament of Australia.

Staged funding for real PFAS destruction

Tightening regulation is a structural tailwind, expanding the pool of government-funded remediation programs.

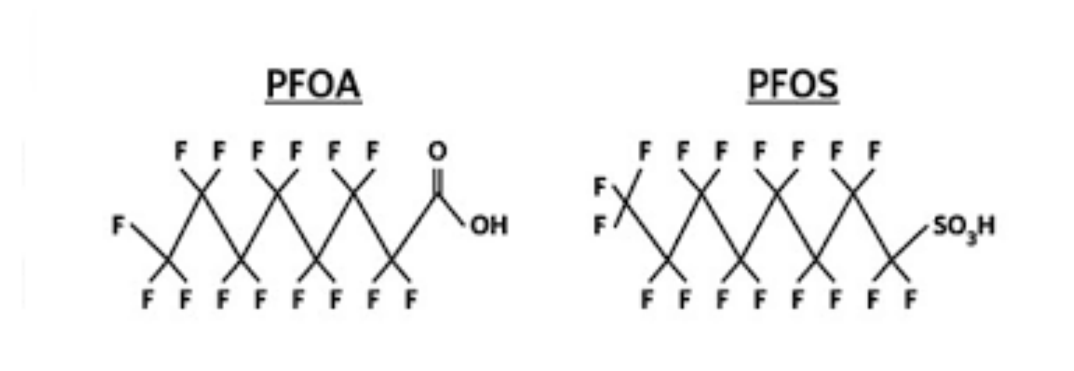
While regulatory frameworks and funding mechanisms are gaining momentum, the key takeaway is that governments are prioritising remediation solutions that deliver measurable, durable PFAS destruction rather than interim containment. For ECT, this creates a plausible funding pathway that aligns with its current stage of development. As an early-stage growth company operating within a strengthening regulatory tailwind, ECT may be positioned to access government-backed support for research, development, and pilot-scale milestones. This is not guaranteed, of course, However, if ECT continues to meet technical and commercial benchmarks, the company could become a credible candidate for government-led funding initiatives. Over time, this support could extend to scale up and early deployment, accelerating time to market while reducing capital intensity and execution risk. This type of staged funding progression is a common route for emerging technologies that address national priorities.

PFAS 101: The chemicals behind the contamination problem

PFAS is a vast chemical family with up to ~15,000 variants, with PFOS and PFOA among the most detected legacy compounds.

Looking more in depth at Per- and polyfluoroalkyl substances, referred to throughout this report as PFAS, are a large group of manufactured chemicals that have been widely used in industrial and consumer products since the 1940s. Today, there are thousands of known PFAS compounds, with estimates suggesting up to 15,000 synthetic variations with slight alternations to their chemical compounds[16]. The two most common types of PFAS which we have mentioned, are found in water systems and soil, are perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS)[17]. These compounds sit within the same family tree as PFAS (Figure 5) and are more commonly known and studied which we will detail throughout the report[18]. It is also important to note that some of these chemicals have been studied and linked to environmental and human health impacts, while many others remain poorly understood.

Figure 5: Molecular structures of PFOA & PFOS



Source: HDR (2021).

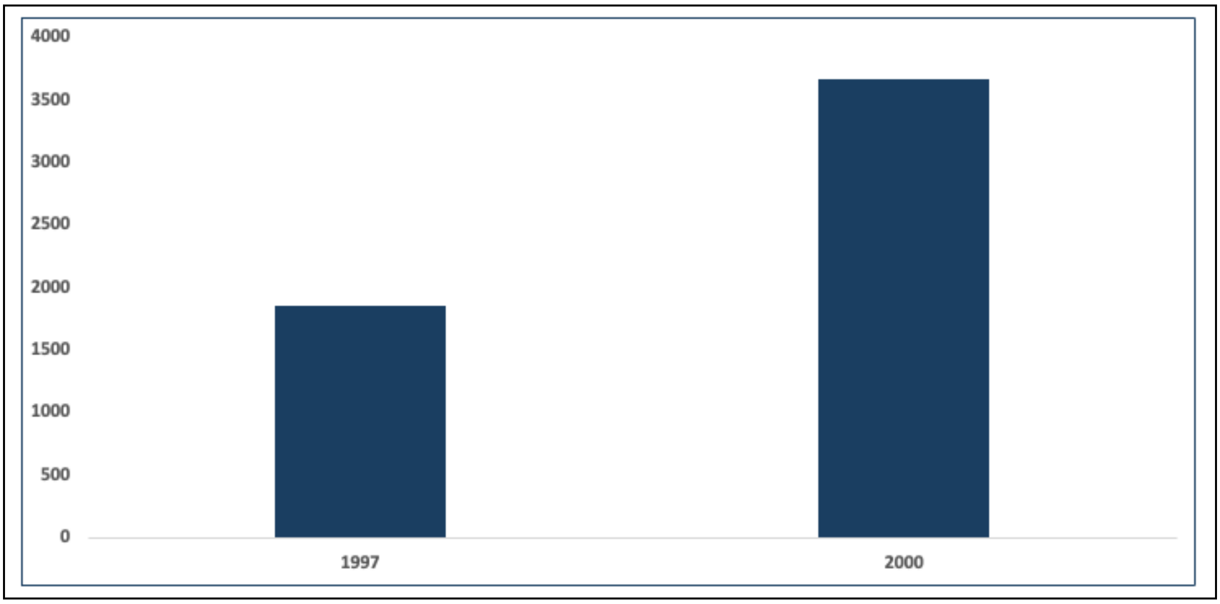
The 1940's PFAS boom leading to a long tail liability

PFAS production surged through the early 2000s, becoming a, high-margin profit business.

The widespread adoption of PFAS can be traced back to the late 1940s, driven primarily by two industrial leaders: 3M and DuPont. 3M first encountered PFAS almost inadvertently during fluorochemical research in the late 1930s[19]. Upon recognising their highly unusual performance characteristics, such that of thermal and water resistance, the company rapidly moved to commercial production, developing applications such as stain and water repellents, surface treatments, and protective industrial coatings. As PFAS use scaled globally, production volumes expanded materially. At peak levels in the early 2000s, the United States Environmental Protection Agency estimated annual PFOS output at approximately 3665 tonnes per annum (Figure 6), with 3M accounting for the majority of global supply[20]. Currently, over 600 PFAS compounds are bought and sold in the US.

[16] Commonwealth Scientific and Industrial Research Organisation (CSIRO) 'PFAS', CSIRO.
[17] HDR (2021) 'The Challenge of PFAS in Drinking Water Supplies', *HDR Insights*, 18 June.
[18] United States Environmental Protection Agency (EPA) *Our current understanding of human health and environmental risks of PFAS*, EPA.
[19] Interstate Technology & Regulatory Council (ITRC) (2020) *History and Use of Per- and Polyfluoroalkyl Substances (PFAS) found in the Environment* (Fact sheet, August 2020).
[20] See Page 10 OSPAR Commission (2006) OSPAR background document on perfluorooctane sulphonate (PFOS).

Figure 6: 1997 US PFAS production vs 3M production in early 2000's (Metric Tonnes)



Source: OSPAR Commission (2006).

At peak demand, DuPont was generating roughly US$1 to US$2 billion in annual revenue from Teflon.

DuPont emerged as another major commercial force in PFAS, although it did not invent the compounds themselves. Instead, DuPont became one of the most significant downstream users and value extractors, particularly through its flagship product Teflon, the brand name for a range of fluoropolymer materials. DuPont's early annual reports identify Teflon as one of the company's highest-margin specialty materials, generating an estimated US$1–2 billion in annual revenue at its peak[21]. These figures later came to light through disclosures associated with regulatory and legal proceedings. DuPont's manufacturing facility in Parkersburg, West Virginia would subsequently become one of the most heavily PFAS-contaminated sites globally, a case that has since become emblematic of the broader PFAS legacy issue and will be examined in detail later in this report.

Higher PFAS concentrations in blood are associated with an elevated risk of certain cancers.

By the 1980s, PFAS were firmly embedded within the global chemical and manufacturing ecosystem. For companies such as 3M, PFAS had evolved into a strategically important, high-margin product category spanning thousands of commercial and industrial applications. While regulatory scrutiny has intensified in recent years, the financial significance of PFAS remains evident. 3M has announced plans to exit PFAS manufacturing by the end of 2025, yet PFAS-related sales still generated approximately US$1.3 billion in revenue in 2023[22].

The slow-motion health problem

With a clearer understanding of how PFAS were adopted and scaled by major manufacturers such as 3M, it is important to note that widespread public recognition of human health risk did not emerge until the late 1990s and early 2000s, when evidence increasingly showed that certain PFAS can persist and accumulate in the human body. A major inflection point came in 2012, when the C8 Science Panel, established under the DuPont C8 class action settlement,

[21] Environmental Working Group (EWG) (2005) 'For DuPont, $1B a Year Rides on Teflon', *News & Insights*.
[22] 3M Company (2022) '3M to exit PFAS manufacturing by the end of 2025'.

reported "probable links" between PFOA exposure and several health outcomes, including kidney cancer and thyroid disease through a health project that enrolled up to 69,000 participants[23].

Even low-level exposure can accumulate because many PFAS have multi-year half-lives.

An important consideration in assessing PFAS health risk is that different compounds can behave differently in the body. Both long chain and short chain PFAS have distinct exposure profiles and toxicological characteristics, and the science continues to evolve across the broader PFAS class. However, a consistent theme is persistence: even at very low exposure levels, the body eliminates many PFAS extremely slowly. As a result, ongoing low-level exposure can translate into a meaningful cumulative body burden over time, which is central to why PFAS have become a long running public health and regulatory focus.

How PFAS gets in and why it stays

For most people, the primary routes of PFAS exposure are drinking water and food. More recently, elevated concentrations have also been identified in soils, which become the origin of water contamination. Once ingested, PFAS are readily absorbed and circulate primarily in the bloodstream. They bind strongly to blood proteins such as serum albumin and can also interact with liver transport proteins and other biological binding sites, allowing them to persist and distribute throughout the body. PFAS are cleared mainly through the kidneys. However, many PFAS compounds can be reabsorbed in the proximal tubules via specialised transporter proteins. This process effectively recycles PFAS back into the bloodstream rather than allowing them to be excreted, which explains why many PFAS have half-lives measured in years in humans.

A US study found PFAS in the bodies of 97% of participants.

Evidence of widespread exposure is well documented. A report by the US Centres for Disease Control and Prevention found detectable levels of PFAS in approximately 97% of a small control group of Americans tested[24]. Importantly, studies also indicate that blood concentrations of certain PFAS, such as PFOS, declined after these compounds were phased out of many consumer products in the early 2000s, highlighting the link between regulatory action and reduced exposure.

The health risks that build with time

The health effects associated with PFAS exposure vary widely across individuals, specific compounds, and exposure levels, and research into the long-term impacts of these chemicals remains ongoing. Importantly, many reported health outcomes are based on epidemiological associations rather than definitive causation, reflecting both the complexity of biological exposure pathways and the sheer scale of the PFAS universe. With an estimated ~15,000 distinct PFAS compounds, the strength and quality of available evidence vary materially between individual substances.

Depending on the compound, PFAS can persist in the body for roughly 3 to 15 years.

What is well established, however, is the exceptionally slow rate at which certain PFAS are eliminated from the human body. Studies examining biological elimination half-lives indicate that perfluorooctanoic acid PFOA persists in the body for approximately 2–3 years, PFOS for 5–8 years, and

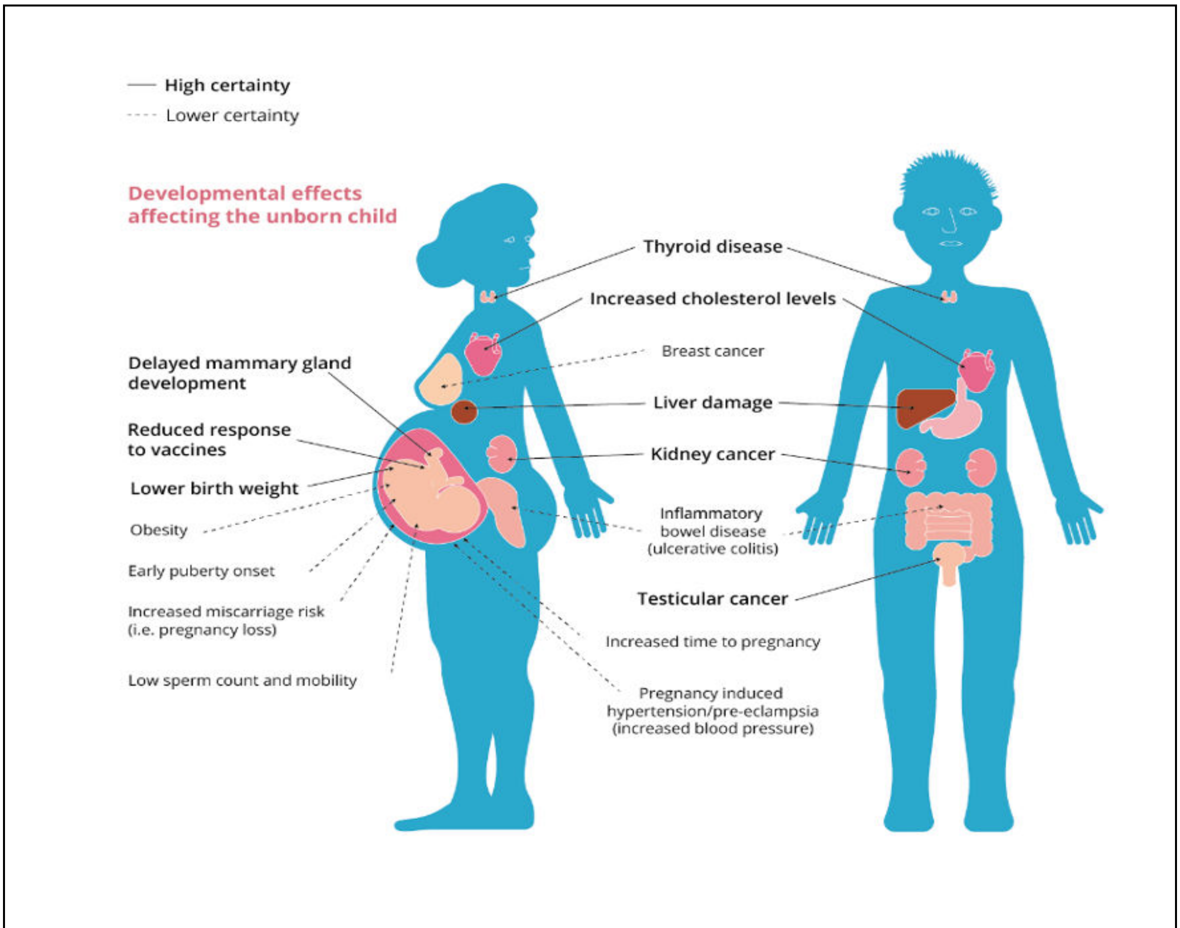
[23] Boston, C., Keck, S., Naperala, A. and Collins, J. (2025).
[24] National Institute of Environmental Health Sciences (NIEHS) *Perfluoroalkyl and polyfluoroalkyl substances (PFAS)*, NIEHS.

PFAS exposure has been linked to higher risks cancer.

PFHxS for 4–7 years. These extended half-lives mean that even relatively low, chronic exposure can lead to meaningful accumulation over time[25].

Despite broader uncertainties across the PFAS class, public health agencies have consistently identified associations between specific PFAS, particularly PFOA, and a range of adverse health outcomes. These include elevated cholesterol levels, immune system effects such as reduced antibody responses to certain vaccines, altered liver enzyme activity, testicular cancer, Thyroid cancer, and associations with kidney & liver disease in long-term population studies (Figure 7)[26]. Researchers have attempted to quantify the economic burden of PFAS linked health impacts in Europe. In one approach, they modelled a narrow set of PFAS associated diseases, including kidney cancer, and estimated that occupational PFAS exposure alone could cost EEA countries roughly €12.7 million to €41.4 million per year for kidney cancer in that limited sample. Broader estimates that incorporate wider population exposure and a larger disease set put total PFAS related health costs in Europe at approximately €52 to €84 billion per year[27]. These figures are inherently model based, but the direction is clear. PFAS is not just an environmental clean-up issue. It represents a large and recurring economic cost.

Figure 7: Effects of PFAS on human health



Source: EEA.

[25] Li, Y., Fletcher, T., Mucs, D., Scott, K., Lindh, C.H., Tallving, P. and Jakobsson, K. (2017) 'Half-lives of PFOS, PFHxS and PFOA after end of exposure to contaminated drinking water', *Occupational and Environmental Medicine*, 75(1), pp. 46–51.
[26] European Environment Agency (EEA) (2020) *Effects of PFAS on human health*.
[27] European Environment Agency (EEA) 2022, *Cross cutting story 3: PFAS*, Zero Pollution Monitoring Assessment, European Environment Agency, Copenhagen.

The real PFAS bill starts underground

PFAS hotspots are typically concentrated around military bases, firefighting training grounds, and commercial airports.

While the health impacts of PFAS contamination are often the headline, the true economic and remediation challenge begins in the soil. A comprehensive academic review by Concawe analysed data from more than 1,000 documented PFAS-contaminated sites globally[28]. The study identified PFAS manufacturing facilities, firefighting training grounds, commercial airports, and military bases as the locations exhibiting the highest concentrations of contamination. These findings are consistent with historical PFAS usage patterns, particularly the extensive use of aqueous film-forming foams (AFFF) in firefighting applications, which are among the most PFAS-intensive products ever deployed (Figure 8)[29].

Figure 8: AFFF firefighting foams – high PFAS concentration products

Source: Envato.

Some hotspot concentrations are roughly 2,900x to 153,000x above household soil guideline levels.

Across the dataset, PFOS emerged as the most prevalent PFAS compound detected in soils. Reported PFOS concentrations ranged from as low as 0.4 micrograms(µg)/kg to extreme levels of 460,000 µg/kg, with a median concentration of 8,722 µg/kg. For context, HIL NEMP PFAS sets a guideline value for Australian household soils at 3 µg/kg[30]. On a median basis, PFOS concentrations at contaminated sites are therefore around 2,900 times higher than background household soil guideline levels. At the upper end of the dataset, concentrations approaching 460,000 µg/kg equate to roughly 153,000 times the residential guideline threshold. These figures underscore the severity of PFAS contamination at industrial, defence, and aviation-linked

[28] Brusseau, M.L., Anderson, R.H. and Guo, B. (2020) 'PFAS concentrations in soils: background levels versus contaminated sites', *Science of the Total Environment*, 740, 140017.
[29] See "contaminated sites" Brusseau, M.L., Anderson, R.H. and Guo, B. (2020).
[30] Heads of EPA Australia and New Zealand (HEPA) (2025) *PFAS NEMP 3.0 Supporting Document 2: Derivation of ecological guidelines for wildlife diet and indirect soil exposure to perfluorooctanoic acid (PFOA), perfluorooctane sulfonate (PFOS) and perfluorohexane sulfonate (PFHxS)*, Department of Climate Change, Energy, the Environment and Water (DCCEEW), Canberra.

sites, and highlight why conventional remediation approaches struggle to operate economically at scale.

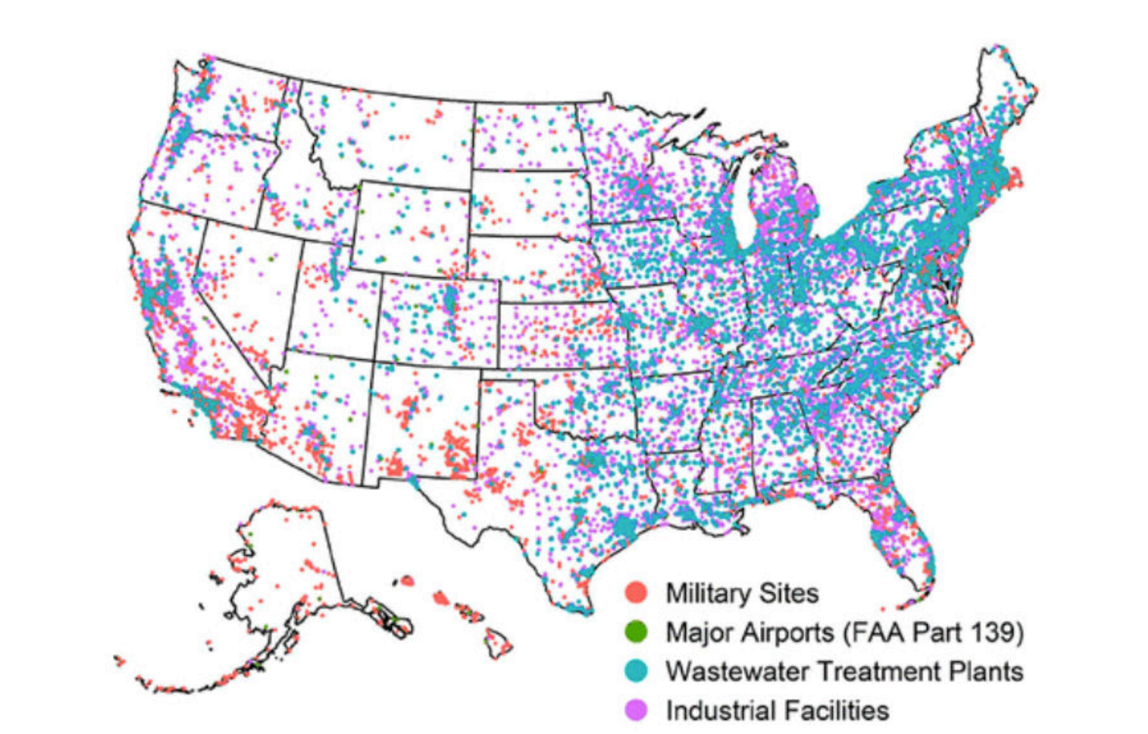
The study also examined the vertical distribution of PFAS within soil profiles. Most sites exhibited the highest concentrations at shallow depths, with concentrations declining exponentially with increasing depth. This pattern aligns with broader peer-reviewed literature, which shows that longer-chain PFAS compounds such as PFOS tend to adsorb strongly to organic matter and mineral surfaces, resulting in accumulation closer to the soil surface.

Long-chain PFAS tend to sorb near the surface, while short-chain PFAS are more mobile and spread through soil.

57,000 Sites, rising spend, the US PFAS market is massive

Looking more closely at the geographic distribution of PFAS contamination, the United States stands out as one of the largest and most economically significant addressable markets for ECT. A peer-reviewed presumptive contamination model (Figure 9) identified 57,412 sites to be impacted by PFAS across the US. This is an estimation, but it does highlight the scale and need for improved regulation[31]. The data set identified 49,145 industrial facilities, 4255 water treatment plants, 3943 former military sites and 519 major airports[32]. This is why regulatory momentum is building in the US, with now around 20 states having established enforceable drinking water standards or health based limits for at least one PFAS compound[33]. While the study states that data is incomplete about the scale and scope of severity of PFAS contamination it does highlight the need for tighter regulatory policies.

Figure 9: Presumptive PFAS contamination sites across the US estimates



Source: ACS Publications, Salvatore et al. (the presumptive contamination model).

[31] Salvatore, D. et al. (2022) *Presumptive Contamination: A New Approach to PFAS Contamination.*
[32] See Salvatore, D. et al. (2022) analysis of the 57,412 potential contaminated sites.
[33] Association of State and Territorial Health Officials (ASTHO) (2025) 'States continue addressing PFAS in food and water', *ASTHO Blog*, 10 April.

The DoD can't ignore the PFAS health risks

A US study led by Mark Purdue found Air Force personnel at PFAS-impacted bases faced a significantly higher risk of testicular cancer.

PFAS remediation is not a peripheral issue for the US defence establishment. It is increasingly viewed as a core operational and health priority. This is partly driven by growing evidence linking PFAS exposure to adverse health outcomes among active duty service personnel. A nested case-control study led by Mark Purdue, a senior investigator, examined the relationship between blood PFAS concentrations and cancer risk among active-duty US Air Force servicemen. The study found that elevated blood levels of PFOS, one of the most persistent and widely detected PFAS compounds, were associated with a higher risk of developing testicular cancer[34]. Importantly, this finding sits alongside a broader body of literature linking PFAS exposure to additional health risks, including immune system disruption, liver dysfunction, and hormonal effects. Given the evidence of associations between PFAS contamination and long term health outcomes for servicemen and women, remediation has become a strategic focus for the United States Department of Defence.

Why PFAS cleanup is lagging across US defence sites

In the United States, PFAS contamination across defence facilities represents a large and costly remediation challenge. The United States Department of Defence has estimated total cleanup costs of approximately US$9.3 billion, covering assessment activity across 718 identified military sites[35]. However, only 370 sites progressed beyond preliminary assessment into formal remedial investigation, and none had entered a long-term cleanup phase.

Across 718 military sites assessed so far, but none have yet reached the long-term cleanup phase.

This wide gap between investigation and physical remediation reflects the practical limitations of incumbent treatment approaches. Many conventional methods are capital intensive, technically complex, slow to deploy, and difficult to scale across large or operationally constrained sites. As a result, monitoring and investigation continue to absorb a disproportionate share of total spend, while meaningful remediation activity remains limited, prolonging environmental exposure and associated health risk. The Department of Defence has also indicated that PFAS cleanup cost estimates have more than tripled since 2022[36], with further increases expected as regulatory standards tighten and the scope of affected sites expands. If ECT continues to meet technical milestones and demonstrates credible scale up, it could help convert years of investigation-heavy spending into real cleanup activity. The core opportunity is to offer a PFAS destruction pathway that is faster to deploy, more scalable across complex sites, and potentially lower cost per tonne at higher contamination levels, where incumbent methods tend to become uneconomic or slow to execute.

[34] Purdue, M.P. et al. (2023) "A Nested Case Control Study of Serum Per and Polyfluoroalkyl Substances and Testicular Germ Cell Tumors among U.S. Air Force Servicemen", *Environmental Health Perspectives*.
[35] U.S. Government Accountability Office (GAO) (2025) *Persistent chemicals: DOD needs to provide Congress more information on costs associated with addressing PFAS* (GAO-25-107401) (PDF).
[36] See chart Department of Defense (DOD) Estimated Future Costs for the Investigation and Cleanup of Per- and Polyfluoroalkyl Substances (PFAS)by Fiscal Year.

Australia's PFAS bill is flying higher

Australia has an estimated 1,700 PFAS-contaminated sites, with 28 classified as high priority.

Looking more locally, Australia also represents a meaningful and growing market for PFAS remediation, particularly given the concentration of contamination linked to defence and aviation infrastructure. In 2024, the Australian Department of Defence spent approximately A$804 million managing and remediating PFAS-contaminated sites nationwide. To date, ECT states more than 1,700 sites have been identified, with 28 classified as high priority across Australia[37]. These high-priority sites are largely associated with elevated concentrations of firefighting foam exposure, indicating a strong linkage to military bases and defence training facilities where aqueous film-forming foams were historically used[38].

At a state level, the NSW Select Committee on PFAS highlights the breadth of contamination. Under the NSW PFAS Investigation Program, more than 1,100 sites have been assessed, with 51 sites identified as having significant PFAS contamination requiring further investigation or active management[39]. These sites span a mix of industrial areas, defence adjacent locations, and critical infrastructure corridors.

Australia turns the PFAS destruction dial up

Australia's PFAS National Environmental Management Plan is already on its third iteration.

Regulatory settings are also evolving. Australia's PFAS National Environmental Management Plan (NEMP) has progressed through multiple iterations and is now in its third version, reinforcing that PFAS remains an active policy priority rather than a settled framework. Notably, the latest version includes a more substantive discussion of remediation methods and treatment strategies than earlier editions, including greater acknowledgement of destructive pathways. For ECT, this is an encouraging directional signal because it suggests regulators are increasingly focused on solutions that move beyond containment and monitoring. Civil aviation infrastructure has also emerged as a material exposure pathway. Airports, where firefighting services historically relied on PFAS containing foams, represent a concentrated source of contamination. Under the national "Airport Investigation Program", investigations commenced in 2024 at Archerfield, Camden, Gold Coast, Jandakot, Moorabbin, Mount Isa and Townsville airports, with the broader program expected to be completed by 30 June 2027[40].

A$130 million has been committed to an airport PFAS investigation program.

In support of this effort, the Australian Government has committed A$130.5 million to a national PFAS Airports Investigation Program, with 25 airports currently participating[41]. The program is designed to determine the nature and extent of PFAS contamination through independently audited whole of site testing, and to develop robust management plans to address any identified risks.

[37] Parliament of Australia, Senate Select Committee on PFAS (per and polyfluoroalkyl substances) (2025) 'Chapter 5: Remediation of PFAS affected sites', *Interim report* (March 2025), Parliament of Australia.
[38] See 5.26, State-level management and remediation, Parliament of Australia, Senate Select Committee on PFAS.
[39] See 5.28, State-level management and remediation, Parliament of Australia, Senate Select Committee on PFAS.
[40] See 5.20, PFAS Airports Investigation Program, Parliament of Australia, Senate Select Committee on PFAS.
[41] See, "The Australian Government has committed $130.5 million for the PFAS Airports Investigation Program at civilian airports where the Commonwealth historically provided firefighting services using PFAS-containing foams."

ECT's go to market strategy matches the PFAS policy shift

ECT's go-to-market strategy aligns neatly with Australia's tightening PFAS policy framework.

There are clear synergies between ECT's go to market strategy and the direction of PFAS policy in both Australia and the United States. Defence agencies increasingly need a scalable "wedge" that shifts remediation from containment and monitoring toward durable destruction because the "forever" liability ultimately has to be addressed. A technology that can credibly destroy PFAS in situ or ex situ and materially reduce long term liability becomes strategically attractive. ECT's commercial model is well aligned with this requirement. By licensing an FJH integrated process into industrial machinery, ECT could supply modular treatment units that can be deployed site by site. That structure lends itself to monetisation through per site fees, throughput-based royalties, and recurring revenue streams tied to usage and performance. While this is conceptual for now, it highlights the clearest pathways to commercial revenue.

If ECT can scale FJH reliably, the commercial upside is substantial.

In Australia, as in the US, the Department of Defence PFAS program spans hundreds of installations, yet progress into remedial action has been slow, reflecting the cost, complexity, and operational friction of incumbent methods. If FJH can demonstrate high defluorination performance at meaningful throughput, deliver compliant byproducts which has already been demonstrated, and achieve a competitive cost per tonne, ECT could build a multi-channel revenue stack via equipment supply, project based licensing, and longer duration service revenue through partnerships with established remediation contractors. The strategic opportunity is not to capture the full Defence remediation budget. It is to win repeatable deployments across the subset of high concentration, high tonnage sites where destruction is required and where modular treatment units can be implemented with minimal disruption to base operations.

Why incumbent methods fail the forever chemical test

Legacy remediation is structurally inefficient and highly capital-intensive.

When comparing ECT's remediation strategy with incumbent approaches, it is important to understand both the advantages and limitations of existing methods, and where Flash Joule Heating provides a differentiated solution focused on permanent PFAS destruction. Globally, PFAS remediation is still dominated by a narrow set of legacy techniques, most notably excavation and landfill disposal. These methods are widely used because they are operationally straightforward and deliver an immediate reduction in on-site exposure risk. However, they do not destroy PFAS compounds. Instead, contamination is transferred offsite, shifting long-term liability rather than eliminating it, a common issue within the PFAS remediation value chain.

Excavation looks cheap until you do the maths

While excavation and landfill disposal is often viewed as the simplest remediation option, real-world case studies show it can become one of the most expensive pathways once site scale, regulation, transport distances, and disposal capacity constraints are factored in. According to the Federal Remediation Technologies Roundtable, soil excavation and disposal costs range from $270 to $460 per tonne, depending on contamination levels and excavation methods[42].

Average operating costs typically range from roughly US$270 to US$460 per tonne.

In Belgium, PFAS contamination around a major 3M industrial area near Antwerp became a high-profile issue as construction progressed on the Antwerp ring road and tunnel program (Figure 10). The project, estimated at roughly €4.5 billion, required the handling of around 14 million cubic metres of soil, and the extent of PFAS contamination became increasingly clear as earthworks expanded[43]. Reported remediation economics illustrate the core challenge: PFAS mass in soil can be relatively low per tonne, meaning extremely large volumes of soil must be excavated and managed to remove a small quantity of PFAS. In this case, estimates suggested it could take roughly 30,000 kg of soil to remove around 1 kg of PFAS, implying an effective cost of around €10 million per kg of PFAS removed[44]. 3M has also previously settled to fund clean-up volumes at the site, but the broader takeaway remains that scale makes excavation-based solutions rapidly uneconomic.

Figure 10: PFAS contamination around a major 3M industrial area

Source: David PINTENS Getty images

The project carried an estimated €4.5 billion price tag and involved handling roughly 14 million cubic metres of material.

Even when excavation is executed successfully, landfill disposal does not destroy PFAS. It relocates contamination into a contained waste cell, and the long-term liability shifts to containment performance and preventing future leakage. A US disposal example highlights the same cost pressure. At one US airport site, disposal costs were reported at roughly US$71,000 to remove 76 cubic metres of contaminated soil, equivalent to around US$585 per tonne[45]. This helps explain why excavation and disposal often dominates remediation

[42] Plamann, D. (2025) 'Evaluating contaminated soil removal costs and considerations', *Fehr Graham*, 7 March.
[43] Baker, S. (2022) '3M's "Forever Chemicals" Crisis Has Come to Europe', *Bloomberg*, 10 June.
[44] Horel, S. and Aubert, R. (2025) 'Excavating soil, changing lake water, no playing outside: PFAS-contaminated Flanders' dystopian disaster', *Le Monde* (Les Décodeurs), 15 January.
[45] Jacobs U.K. Limited (2023) *PFAS: Evaluating the economic burden of remediating high-risk sites*. PFAS Risk Screening Project, Phase 4, Work Package 4.

budgets before any on-site treatment is even considered, and why scalable destruction-based technologies are increasingly sought by regulators and site owners (Figure 11).

Figure 11: Real World Excavation Remediation Case Studies

Real World PFAS Remediation Case Studies + Opportunities for ECT			
Project Name	**Location**	**Remediation volume (m³)**	**Total removal cost**
Macquarie Point Precinct Plan	Australia	540	US$17m
Melbourne Airport	Australia	1,000,000	US$85.5+
West gate Tunnel	Australia	1,500,000	US$3-3.3b
Chemours 1,300 contaminated locations	Europe	Not disclosed	US$30m - US$60m
3M PFOS contamination	Zwijndrecht, Belgium	Not disclosed	US$675m
Former Naval Air Station Brunswick	USA	~ 50,971	US$1.5b
Antwerp Project	Belgium	14,000,000	US$5.3b

Source: PSR Estimates

The trade off in soil washing

Soil washing can outperform excavation on treatment outcomes, but it demands substantial upfront capex.

Soil washing is another established remediation method and is often positioned as a better cost-control strategy than excavation and relocation. It targets the physical behaviour of PFAS in soils, where contamination tends to bind to fine particles such as clays and silts rather than coarse sands and gravels. In practice, contaminated soil is mixed with water and processed through screening and separation equipment, producing a cleaner coarse fraction and a smaller, highly contaminated fines stream.

[46] *The Age* 2021, 'West Gate Tunnel project faces $4b blowout amid contaminated soil crisis'
[47] PFAS Central 2024, 'Chemours to fund costly cleanup of PFAS contaminated gardens in Dordrecht', *PFAS Central*
[48] Military Poisons 2024, 'Calculating Brunswick's cleanup price tag', Military Poisons
[49] Tasmanian Planning Commission 2025, Annexure S: AECOM Australia environmental condition of the site (31 January 2025), Tasmanian Government

Why soil washing struggles to scale

Operating costs are typically ~US$100 to US$200 per tonne, excluding capex.

There are three common soil washing configurations: physical separation, chemical extraction of the full soil mass, and hybrid systems that combine both. While operating costs are often quoted at US$100 to US$200 per tonne, these figures typically exclude the substantial capital required to build and commission the plant[50]. For soil washing to be economically viable, projects generally need minimum volumes of around 10,000 tonnes and a sustained throughput of 20 to 50 tonnes per hour[51]. At this scale, the infrastructure build is significant and demands meaningful financing capacity. Importantly, the headline cost also doesn't account for the downstream handling of the "dirty leftovers", the PFAS-rich fines stream. These fines usually require additional treatment or disposal, and this downstream step can be one of the most expensive parts of the entire soil washing workflow.

The key constraints are capital intensity and site logistics. Significant upfront investment is required for plant infrastructure, civil works, water supply, power, and wastewater management. These capex requirements often represent the largest source of value destruction. Performance is further challenged in clay-rich soils, which generate large fines streams that frequently require secondary treatment or disposal, driving costs materially higher.

Bring on the heat

Electrothermal remediation delivers a better outcome at a materially lower cost.

The key advantage of ECT's electrothermal remediation is that it can destroy PFAS, rather than relocate it. A critical point for readers is that PFAS is not a single chemical. Different PFAS compounds have different bond structures, and some are materially harder to break than others, which is why high temperature destruction pathways matter. On an operating cost basis, electrothermal treatment is estimated at roughly US$75 to US$143 per tonne in electricity costs[52]. Relative to legacy approaches, this implies electrothermal remediation can be around 25% to 62.5% more cost-efficient than soil washing, and around 47% to 84% more cost-efficient than excavation and landfill disposal, depending on site conditions and contamination severity[53]. These ranges should be viewed as lower and upper bound estimates rather than fixed outcomes. Importantly, these operating cost figures do not include capital expenditure. However, once ECT progresses into an industrial partnership and moves toward an integrated mobile unit design, capex should become clearer. At this stage, it is reasonable to expect capex intensity to be materially lower than the fixed infrastructure required for large soil washing and water treatment plants, which typically require substantial civil works, utilities, and permanent site buildouts.

High heat kills PFAS, but consistency is the real moat

Electrothermal remediation can destroy PFAS.

The Environmental Protection Agency also highlights a key advantage of high-temperature treatment: PFAS can be mineralised, converting fluorine into stable, non-toxic end products such as calcium fluoride. The challenge is chemistry. The carbon–fluorine bond is exceptionally strong, and bond-energy calculations indicate that destroying some PFAS species may require temperatures up to around 1,000°C. Flash Joule Heating has been validated at

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[50] United States Government Accountability Office (2025) *Persistent chemicals: DOD needs to provide Congress more information on costs associated with addressing PFAS.* Report to Congressional Committees, GAO-25-107401.
[51] See Considerations for managing PFAS and PFAS-containing materials, United States Environmental Protection Agency (2024) *Interim guidance on the destruction and disposal of perfluoroalkyl and polyfluoroalkyl substances and materials containing perfluoroalkyl and polyfluoroalkyl substances, Version 2, interim guidance for public comment.*
[52] Cheng, Y. *et al.* (2024) 'Electrothermal mineralization of per- and polyfluoroalkyl substances for soil remediation', *Nature Communications.*
[53] Pitt Street Research estimates based on comparison of cost per tonne on legacy remediation methods.

temperatures capable of meeting and exceeding this threshold. ECT's current engineering focus is ensuring this performance is repeatable in the field, through a versatile electrode and power system that can consistently deliver the voltage and energy needed across both weaker and stronger PFAS bonds.

Soil moisture and PFAS mix can materially shift the voltage and energy required to hit destruction conditions.

Site conditions introduce further variability. Soil moisture, mineral composition, and electrical conductivity can materially affect how efficiently heat is generated and distributed, and therefore what voltage settings are required. While early tests suggest consistent remediation outcomes across multiple soil types, operating parameters, and energy demand are unlikely to be uniform from site to site. This is a technical challenge ECT is addressing as it moves from lab validation toward field deployment, and a core reason ECT is focusing on expanding its engineering team.

ECT near-term catalysts, the path to field readiness

For investors assessing the Environmental Clean Technologies investment case, it is important to recognise the company remains in an early stage of its lifecycle. Over the next three months, the key catalysts are primarily technical (Figure 12).

The electrical system is the near-term milestones

1–3 months: The first milestone is finalising hardware and safety system sign-off. Investors should look for evidence of repeatable performance through hundreds of hours of continuous operation testing, supported by robust electronics that can adapt to variability in soil conditions and PFAS profiles. The next milestone is demonstrating a stable operating configuration and credible run rate, with a focus on electrical system reliability and performance consistency over time.

From a market perspective, these near-term technical milestones are more likely to drive a modest re rating. However, they matter because they validate repeatability and field readiness and reinforce execution momentum as ECT expands its engineering capability and continues R and D collaboration with Rice University.

The next re-rating catalysts are the technical milestones that de-risk delivery of the high-voltage electrical system.

ECT moves toward commercial proof

3-9 months: Pilots and Mobile Unit Design. The more material inflection point is expected in the following 3-6 months, when ECT begins the transition from technical validation to commercial pilots and a mobile unit design. At this stage, investors will want to see defined specifications and throughput targets, along with pilot testing that demonstrates performance across a range of soil types, moisture conditions, electrode spacing configurations, and energy per tonne outcomes. This is where the narrative shifts from a science project to a product pathway, and where re rating potential moves from medium toward medium to high if execution is strong.

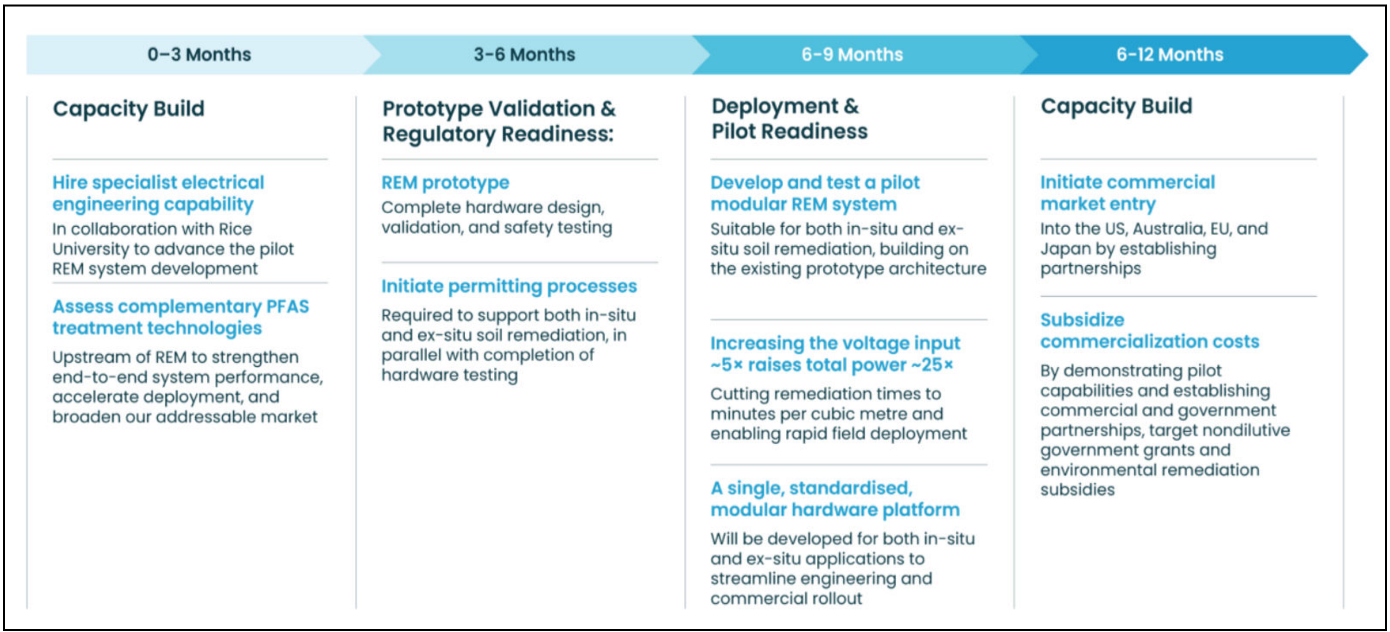
The key de-risking step

9-18 months: Scaled Pilots and a Clear Monetisation Path. Once ECT has delivered its technical milestones and pilot unit design, the next stage is proving the pilot program at a meaningful scale. This involves higher throughput operation in real-world soils, supported by secured partnerships

Landing a commercial partnership with a major industrial machinery OEM is the inflection point for ECT.

that define the deployment pathway across equipment providers, remediation contractors, and end customers. Importantly, scaled pilots should also quantify key commercial variables such as energy per tonne, performance consistency across different soil types, and overall system robustness. This phase is also where the revenue model becomes clearer. Successful pilots can translate into early commercial structures such as equipment supply, licensing, throughput-based royalties, and per site fees, providing investors with a more tangible line of sight to monetisation. The re rating potential at this point is high because it meaningfully reduces the two largest valuation discounts. First, it validates performance outside the lab in realistic operating conditions. Second, it establishes a credible monetisation pathway and commercial framework, which is essential for underwriting long-term value creation.

Figure 12: ECT's technology development roadmap



Source: Company

Comparable companies

Metallium's FJH execution proves the playbook. It shows ECT how to cross from lab proof to commercial scale.

We have focused our peer set on ASX listed companies across the waste management and sustainable technology sector (Figure 13). This approach is deliberate. At this stage, we believe ECT should be valued in line with how the market is currently pricing early-stage environmental technology platforms in Australia, where valuation is driven less by near term cash flows and more by technical milestone progression and early commercial traction.

Within this universe, Metallium is a particularly relevant reference point. Metallium has incorporated flash joule heating into its platform and is now moving from laboratory validation into demonstration and early commercial execution, with emerging evidence of value creation as technical and commercial risk is progressively retired. While business models and end markets differ, the milestone-based pathway from proof to scaled deployment provides a useful analogue for framing how the market may re rate ECT as it advances through its own commercialisation roadmap.

The market has de-rated, ECT's technology has not

It is important for investors to note that geopolitical tensions and a sharp tightening of risk appetite have driven significant multiple compression across the peer group and the small-cap universe. This reflects exogenous sentiment-driven de-rating rather than any fundamental change in ECT's underlying technology or commercial pathway. Figure 13 illustrates how quickly this compression occurred as global tensions escalated. We include a sensitivity analysis below to show how shifts in market sentiment and milestone progression interact to affect our valuation range.

Figure 13: ECT Comparable Analysis

Company	Code	Market Cap (A$m)	Location
ASX-Listed			
Metallium Ltd	ASX.MTM	445.8	Western Australia
Scidev Ltd	ASX.SDV	36.1	Sydney, Australia
Environmental Group Ltd	ASX.EGL	78.0	Mount Waverley, Australia
Hazer Group Ltd	ASX.HRZ	94.3	Perth, Western Australia
Calix Ltd	ASX.CXL	161.8	Sydney, Australia
Environmental Clean Technologies Ltd	**ASX.ECT**	**36.7**	**Perth, Western Australia**

Source: PSR Estimates

ECT's ASX listed peers

Metallium (ASX:MTM) is an emerging critical minerals recovery company commercialising Flash Joule Heating (FJH) to extract valuable metals from ores and industrial waste streams. The underlying FJH approach originated from Professor James Tour's group at Rice University in Houston and has been licensed by MTM as the core of its recovery platform. The process delivers an ultra-high temperature electrical pulse through a feedstock, rapidly converting complex waste materials, such as end-of-life circuit boards, into recoverable mineral phases that can be re processed into their underlying ore equivalents. This can include lithium bearing minerals such as spodumene and rare earth bearing minerals such as monazite.

MTM is now building commercial momentum through early-stage partnerships that de risk scale-up. Glencore is supplying up to 2400 tonnes of the feedstock for Metallium's Stage 1 pilot program, which targets approximately 8,000 tonnes per annum of circuit board material. In addition, Metallium has announced that Element USA has executed a binding letter of intent to deploy FJH for the recovery of gallium, scandium, and related metals from red mud in the United States[54].

SciDev (ASX:SDV) is a water and wastewater solutions company that supplies a blend of specialty chemicals and engineered treatment and dewatering systems. Its products are deployed primarily into water-intensive end markets, including mining, infrastructure, and industrial applications, as well as contaminated water streams, including PFAS-impacted water.

A key feature of SciDev's model is its recurring revenue engine. In many deployments, SciDev supplies ongoing chemistry and consumables into an

[54] Metallium Inc, *Metallium Inc.*

installed treatment process, creating repeat purchases alongside longer duration service relationships. In parallel, the company also wins project-based contracts to design and construct treatment infrastructure. One example is the Western Harbour Tunnel project, where SciDev is delivering water treatment plants designed for continuous operation. These plants run 24/7, treating up to 35 L/s at the southern portal facility and 15 L/s at each plant at the northern portal[55].

Environmental Group (ASX:EGL) is an industrial environmental solutions provider that designs, manufactures, installs, and services engineered systems for industrial customers. Its solutions are used to control air emissions, support energy and industrial infrastructure, and treat contaminated water streams, including PFAS-impacted water. The business model is primarily project-driven. Revenue can be lumpy due to the timing and size of capital projects, but the company benefits from repeat contract wins and an installed base that supports ongoing service and maintenance work over time. Based on its FY25 reporting, Environmental Group generated approximately $111 million in revenue[56].

Hazer Group (ASX:HZR) is a useful analogue for ECT's platform-style commercialisation approach, particularly when framing the COLDry opportunity. Like ECT, Hazer is an IP led company focused on taking a proprietary process from development into commercial deployment. Hazer's core technology, the HAZER Process, converts methane-based feedstocks into two saleable outputs: hydrogen and high-quality synthetic graphite. At a high level, the process is designed to produce hydrogen with a lower emissions profile than conventional fossil-based hydrogen routes, by converting a larger share of the carbon into a solid graphite product rather than emitting it as CO2. Commercially, Hazer's model is built around licensing its technology and partnering for deployment, with the company's valuation and investor perception largely driven by milestone progression as projects advance through development, pilot validation, and commercial agreements[57].

Calix (ASX:CLX) is another relevant comparable within the industrial decarbonisation and sustainability technology cohort. The company is built around a core platform that uses direct, radiative heating to process minerals more efficiently and, in certain applications, enable separation and capture of CO2. Calix is also progressing electrification pathways and renewable integration, aligning with the broader shift toward lower emissions industrial processing. We reference Calix alongside other IP-led peers because it illustrates a similar commercial logic. Calix has developed proprietary, patented technology and is scaling through licensing and partnerships, a model that can deliver attractive margins if adoption accelerates and the technology becomes embedded in customer processes. This licensing-oriented scaling mechanism provides a useful comparison for how ECT may be valued as it moves from technical validation toward commercial deployment.

[55] SciDev Ltd, *SciDev Ltd*.
[56] The Environmental Group Limited (2025) *FY25 Annual Report (Annual Report 2025)*.
[57] Hazer Group Limited *Commercialising the Hazer Process.*

Our valuation of ECT

We have applied a peer-weighted valuation framework to ECT. At this stage, we view a full DCF as premature, given the company remains in the engineering and early commercialisation phase. However, it is reasonable to triangulate value using comparable peers at similar stages of technical validation and early partner engagement, where the market is primarily pricing milestone progression and commercial pathway credibility rather than steady state cash flows.

The market pays for milestones

A useful reference point is Metallium, which successfully re rated as it transitioned from strong laboratory results into its first meaningful commercial partnership and commenced the move toward demonstration scale execution. ECT today is comparable to where Metallium sat around January 2025, when Metallium was valued at approximately A$114 million market capitalisation and was progressing from validated lab performance to early commercial traction alongside the Texas demonstration plant build-out phase. While Metallium's end markets, business model, and capital requirements differ from ECT's, the underlying investment mechanics are the same. In both cases, the market is underwriting a milestone-based pathway from laboratory proof to scalable commercial deployment. In this case, that is why we have valued ECT at 21% to 27% of Metallium's current market capitalisation, as we think that is a conservative view of where ECT could realistically get to.

We also believe ECT's path to key milestones may be faster. ECT is primarily scaling an electronic system with a capital-light, IP-led commercial model, which can be iterated and deployed more rapidly than a heavy, plant-based demonstration build. On that basis, the Metallium precedent is informative for framing ECT's potential re rating range as execution risk declines.

Our valuation range and what must go right

We have created a sensitivity valuation range using Metallium's market capitalisation of $445 million as the starting point, as this likely reflected the market's genuine assessment of the technology's value[58].

Valuation of A$0.27 to A$0.34 per share.

In our base case, we value ECT at approximately A$95 million, or A$0.27 per share. To support this outcome, ECT would need to deliver its near-term technical milestones mentioned in the previous chapter, including clear validation of system progression and improved operational continuity, alongside early evidence of commercial engagement with potential partners. In our view, this is consistent with what the market has historically been willing to pay for comparable milestone progression in early-stage environmental technology platforms.

In our optimistic (bull) case, we value ECT at approximately A$120 million, or A$0.34 per share, representing a 25% premium to the base case. This assumes results exceed expectations, timelines compress relative to market perception, and the company demonstrates tangible progress toward a licensing led commercial model, including credible partner discussions and early deal structures.

[58] See: Valuation benchmark based on Metallium's Intra-day market capitalisation on 8 April 2026.

Figure 14: Our ECT Valuation

ECT Valuation Points to Major Upside		
Fundamental & Milestone Driven Valuation		
Valuation	**Base Case**	**Bull Case**
Equity of Metallium (A$m)	445.8	445.8
% Market Cap Applied	21%	27%
Implied Equity of ECT (A$m)	**95.4**	**120.4**
Shares Outstanding (m)	358.8	358.8
Implied Price Target (A$)	**A$0.27**	**A$0.34**
Current Share Price (A$)	A$0.096	A$0.096
Upside (%)	**177%**	**250%**

Source: PSR Estimates

Environmental Clean Technologies management

The company's current board and leadership composition is as follows (Figure 15):

Figure 15: ECT leadership composition

Environmental Clean Technologies management	
Name and Designation	**Profile**
Faldi Ismail Executive Chairman	Faldi is a seasoned corporate advisor and entrepreneur with over 20 years of experience in capital markets, specialising in identifying, structuring, and financing emerging growth companies. He has been instrumental in the establishment and public listing of numerous ASX-listed entities, particularly across the resources, energy, and technology sectors. Mr Ismail has a proven track record in corporate strategy, capital raising, and M&A, and has held board and advisory roles in a range of successful ventures.
Justin Sharp Chief Technology Officer	Justin holds a master's degree in chemical engineering from Rice University and a Bachelor of Science in Chemistry from James Madison University. He is currently a Research Assistant in the Department of Chemistry at Rice University and previously served as a USRA Graduate Researcher at NASA. Mr Sharp has developed several patents related to flash joule heating and joule heating technologies. He has also authored numerous publications on mineral separation techniques and flash joule heating.
Prof. James Tour Advisory Board Member	Professor James Tour is a global authority in chemistry, nanotechnology and advanced materials, and the inventor of the patented Flash Joule Heating (FJH) process that underpins ECT's PFAS soil remediation solution. He is a Professor of Chemistry and Professor of Materials Science and Nanoengineering at Rice University. Professor Tour is internationally recognised for his scientific leadership and innovation, with numerous awards and honours including induction into the National Academy of Engineering and the National Academy of Inventors, and being named among The World's Most Influential Scientific Minds by Thomson Reuters. A number of his inventions and research initiatives at Rice University have been successfully licensed for commercial development.
Justin Mouchacca Non-Executive Director	Justin, a Chartered Accountant and Fellow of the Governance Institute, holds a Bachelor of Business degree with a focus on accounting. He currently leads a chartered accounting firm that provides outsourced company secretarial and accounting services to public and private entities in the resources, technology, bioscience, and biotechnology sectors. With over 18 years of experience in accounting, Justin has expertise in public company responsibilities, including ASX and ASIC compliance, corporate governance, statutory financial reporting, company reorganisations, and shareholder relations.

Jefferson Harcourt Non-Executive Director	Jefferson Harcourt is a seasoned technology commercialisation leader with more than 25 years of experience bridging research and industry. He is currently Executive Director of Eco Detection, where he oversees the development and deployment of advanced continuous water quality monitoring systems for governments and research organisations globally, and Founder and Executive Chairman of Grey Innovation, a commercialisation group that works with universities and research institutions to bring innovations to market. His experience spans environmental technology, healthcare, and national policy. During COVID-19, he coordinated a consortium of manufacturers, research partners, and government agencies to rapidly produce thousands of medical ventilators.
Lewis Utting Advisory Board Member	Mr Utting has over 20 years' experience across the chemical industry, water treatment and mineral processing sectors. He is a former BASF executive, where he held senior roles in specialty chemicals and mineral processing solutions. Mr Utting previously served as CEO and Managing Director of SciDev (ASX:SDV), where he led the company's transformation and was instrumental in building the first PFAS remediation business on the Australian Securities Exchange through the strategic acquisition and commercialisation of advanced water-treatment and PFAS-management technologies. He has authored and co-authored several technical papers and is an inventor on a patent application relating to tailings (mining waste) disposal.
Robert Bilott Advisory Board Member	Robert is a Partner at the US law firm Taft Stettinius & Hollister LLP, a lecturer at the Yale School of Public Health, and author of "Exposure: Poisoned Water, Corporate Greed, and One Lawyer's Twenty-Year Battle Against DuPont." He specialises in environmental law and is widely regarded as a subject matter expert in Per- and polyfluoroalkyl substances (PFAS). Over his 35-year legal career, he has secured billions of dollars in recoveries for clients affected by PFAS in soil and other environments and has built a substantial global network of individuals and organisations impacted by PFAS contamination, many of whom are actively seeking remediation solutions. Mr Bilott is a recipient of the international Right Livelihood Award (the "Alternative Nobel Prize") for his decades-long work on PFAS issues and is widely recognised as a global leader in the fight against PFAS contamination.
Hirokazu Minami Advisory Board Member	Mr Minami is a highly respected leader in Japan's energy and industrial sectors. His career has been defined by successfully introducing advanced technologies to the Japanese market and scaling complex industrial businesses. Mr Minami brings over a decade of executive leadership roles across Japan's heavy industry, chemicals, energy, aerospace, and defence sectors. He has served as a Representative Director across nine companies within the Mainami Group and is the Group's largest shareholder, primarily operating in aviation fuel and petroleum-related businesses. The Mainami Group is a leading aviation fuel and petroleum logistics operator in Japan. Its Aviation Division provides aircraft refuelling services at 11 major airports, supported by advanced fuel hydrant systems, a fleet of 150 trucks and more than 500 employees. The Group also operates extensive fuel logistics networks across Kyushu and the Kansai region under contracts with major petroleum suppliers.

Source: Company

Key risks facing ECT

We see the following risks facing ECT as a company and an investment:

- **Scale up and field performance risk:** A key risk is that laboratory performance may not translate cleanly into heterogeneous field conditions, particularly in wet, clay-rich, or organic-rich soils. In real ground, energy can couple unevenly, leading to hot spots, cold spots, and incomplete treatment. This creates execution risk in the transition from lab proof to pilot-scale deployment. ECT is prioritising this issue through early testing across multiple soil types and by focusing on repeatable operating performance under extended run time conditions, with the aim of building a treatment system that remains effective across variable site characteristics.
- **Engineering execution risk:** Building a pilot system and transitioning to a mobile unit can take longer than forecast because high voltage engineering is specialist-intensive. Iteration cycles are often unforgiving, and a single design flaw can require rework and reset timelines. Delays can increase cash burn and may require dilutive capital raises before key value inflection points are achieved, while this is not a likely risk, it is still a headwind. What to watch is the calibre and pace of hiring in the electrical engineering team, alongside disciplined milestone reporting that includes quantified outputs such as run time hours, throughput, stability metrics, and repeatability across operating conditions.
- **Commercialisation and procurement cycle risk**: Government, defence, and large industrial remediation buyers often run slow procurement processes. If timelines extend, ECT could face a funding gap as pilot progress outpaces contract conversion. A related risk is that strong pilot results may not translate into scaled agreements quickly, delaying revenue visibility. There is also partner dependency risk. If pilot deployment and mobile unit rollout rely on third-party contractors, OEMs, or site operators, timelines and outcomes can be constrained by external execution. Even with a strong technology, this can cap near-term upside or push out commercial milestones. If ECT's strategy relies on partnerships and licensing, execution is partly in other people's hands.
- **Key personnel risk**: There is the risk the company may lose key personnel and be unable to replace them and/or their contribution to the business.

Risks related to high growth small cap companies in general.

Small cap industrial stocks are typically highly volatile, particularly in macro environments characterised by higher interest rates, tighter liquidity, or recession risk. This volatility is a feature of the asset class and is common across early-stage companies, but it is still important for investors to factor in.

Valuations can also be milestone-driven, with share prices often reacting sharply to progress against technical, commercial, and funding inflection points. In addition, regulatory settings are a meaningful variable for environmental and sustainability focused businesses. Regulation can accelerate demand and funding, but it can also introduce uncertainty through shifting standards, permitting requirements, or compliance costs, making it a double-edged driver of risk and opportunity.

Caveat emptor. Investors are advised to be cognisant of the above mentioned specific and general risks before buying shares in any company issued in this report, including ECT.

Appendix I: Capital Structure

Security Class	Number	%
Ordinary shares	358,839,251	72.2%
Options	56,766,671	11.4%
Performance Rights	81,666,666	16.4%
Total	**497,272,588**	100%

Source: Company

Appendix II: ECT COLDry platform

ECT has also developed technologies that are further advanced in the development cycle, with successful demonstration plants already validated and commissioning activities underway. One of these is COLDry, ECT's patented lignite dewatering and densification process. Lignite (brown coal) typically contains very high moisture content, which makes it heavy, difficult to handle, and costly to transport. COLDry addresses this by removing the water and mechanically densifying the material into pellets that are dry, dense, and stable. This matters for the economic value of the feedstock because converting a low quality, high moisture feedstock into a consistent pellet format creates a standardised, higher utility input that can be used across multiple downstream pathways. In effect, COLDry acts as a front-end "gateway" feedstock, enabling optionality into end markets such as solid fuel for energy generation, or conversion into higher value products such as char and other carbon-based outputs.

The brown coal problem nobody prices in

The core challenge in brown coal processing is its high moisture content. Because so much of the material is water, lignite delivers lower usable energy per tonne, meaning less energy output for each tonne mined, handled, and transported. This materially limits its commercial attractiveness, since transporting lignite often involves moving significant "dead weight" for relatively little energy value. High moisture also increases emissions intensity. Before lignite can generate meaningful heat or electricity, a portion of the energy input is effectively consumed evaporating water. This reduces conversion efficiency and requires more coal to be burned per unit of electricity produced, lifting CO_2 emissions per MWh. In practice, these characteristics make lignite harder to monetise under tightening emissions policies and rising carbon cost pressures.

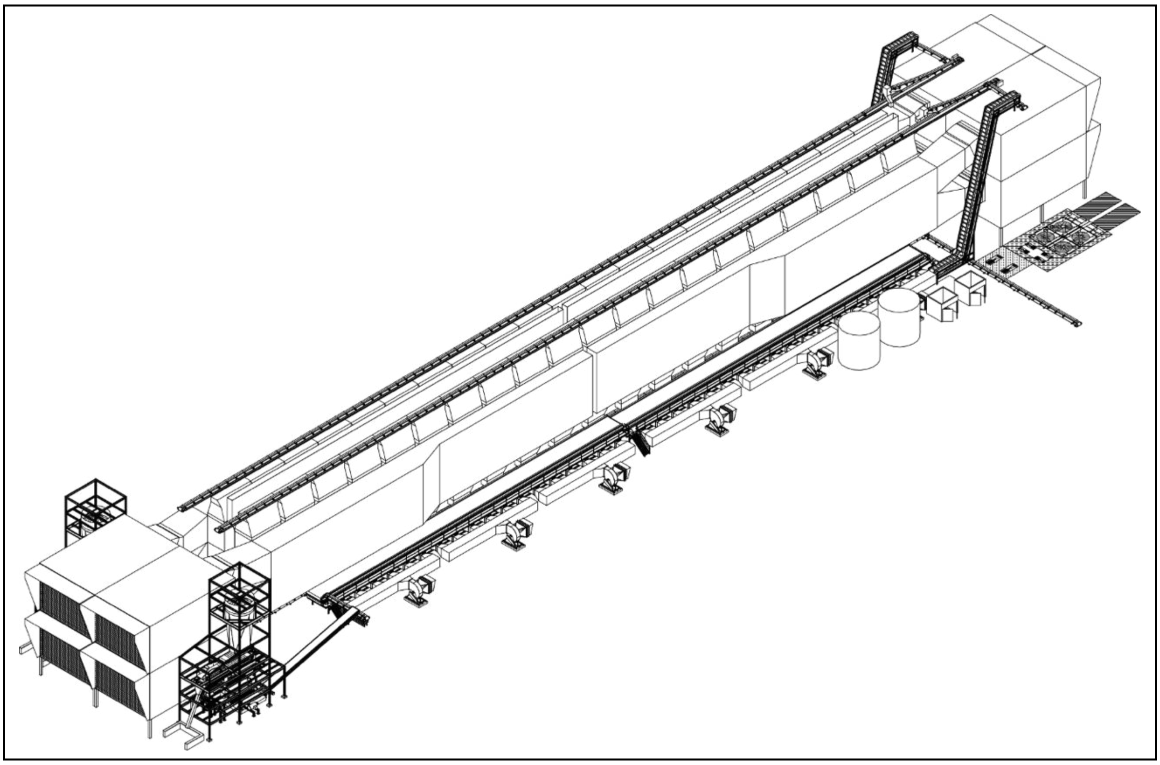
Turning waste heat into a drying engine

ECT's approach is to utilise low grade waste heat that many industrial sites already generate. This heat is typically too low temperature for efficient power generation, often around 35 to 45°C, but it is still sufficient to drive drying processes[59]. ECT is piloting a modular system built from pre-fabricated units that can be shipped and assembled on site, including in remote locations (Figure 16)[60]. The modular design supports faster deployment with minimal

[59] Environmental Clean Technologies Limited (ECT) 2022, COLDry.
[60] Environmental Clean Technologies Limited (ECT) COLDry Detail.

custom engineering and, critically, reduces downstream capital intensity. Instead of funding large new plant builds, operators can integrate modular units into existing workflow streams. This architecture also improves scalability, as additional modules can be added incrementally as throughput requirements grow.

Figure 16: ECT Modular and prefabricated COLDry Unit



Source: company

Less heat, less pressure, less cost

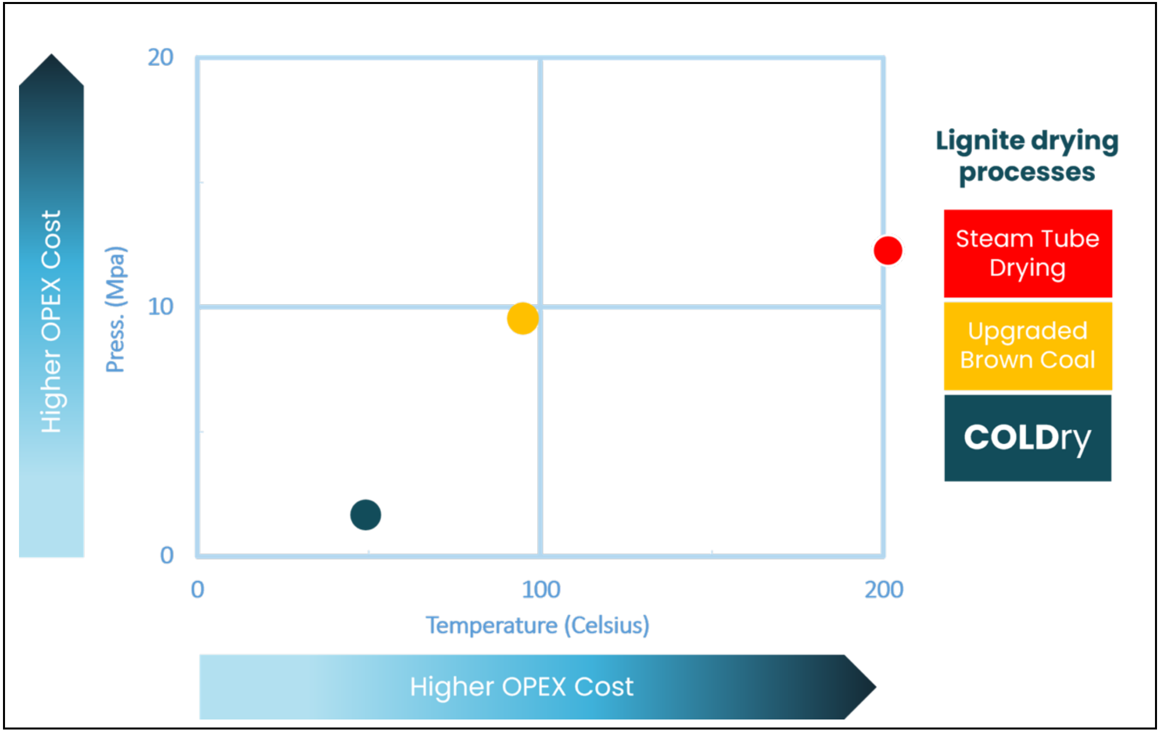
From an operating cost perspective, the key benefit is lower capital intensity and improved mechanical simplicity. With fewer moving parts and fewer complex subsystems, a modular unit can be inherently more reliable, with fewer components that can fail. This matters because lignite, particularly from regions such as Victoria's Latrobe Valley, can carry very high moisture content. At around 60% moisture, a large portion of what is transported and combusted is effectively water, which materially reduces net energy yield and inflates logistics and handling costs[61].

Against this backdrop, the process conditions in (Figure 17) highlight a clear intensity gradient across drying and upgrading pathways. Steam tube drying sits at the high end, operating at roughly 200°C and around 12 MPa, making it the most energy intensive and capital heavy option, and typically requiring a more complex plant. Conventional upgraded brown coal sits in the middle at approximately 100°C and 10 MPa, still meaningfully pressurised and heated, implying moderate to high operating costs. By contrast, COLDry operates at materially lower conditions, around 50°C and roughly 2 MPa. This positions it as a lower intensity process with reduced high temperature and high pressure

[61] See "Features & Benefits" Environmental Clean Technologies Limited (ECT) COLDry Detail.

requirements, supporting a simpler plant design and, in turn, a structurally lower operating cost profile relative to the higher intensity alternatives.

Figure 17: Opex comparison chart



Source: company

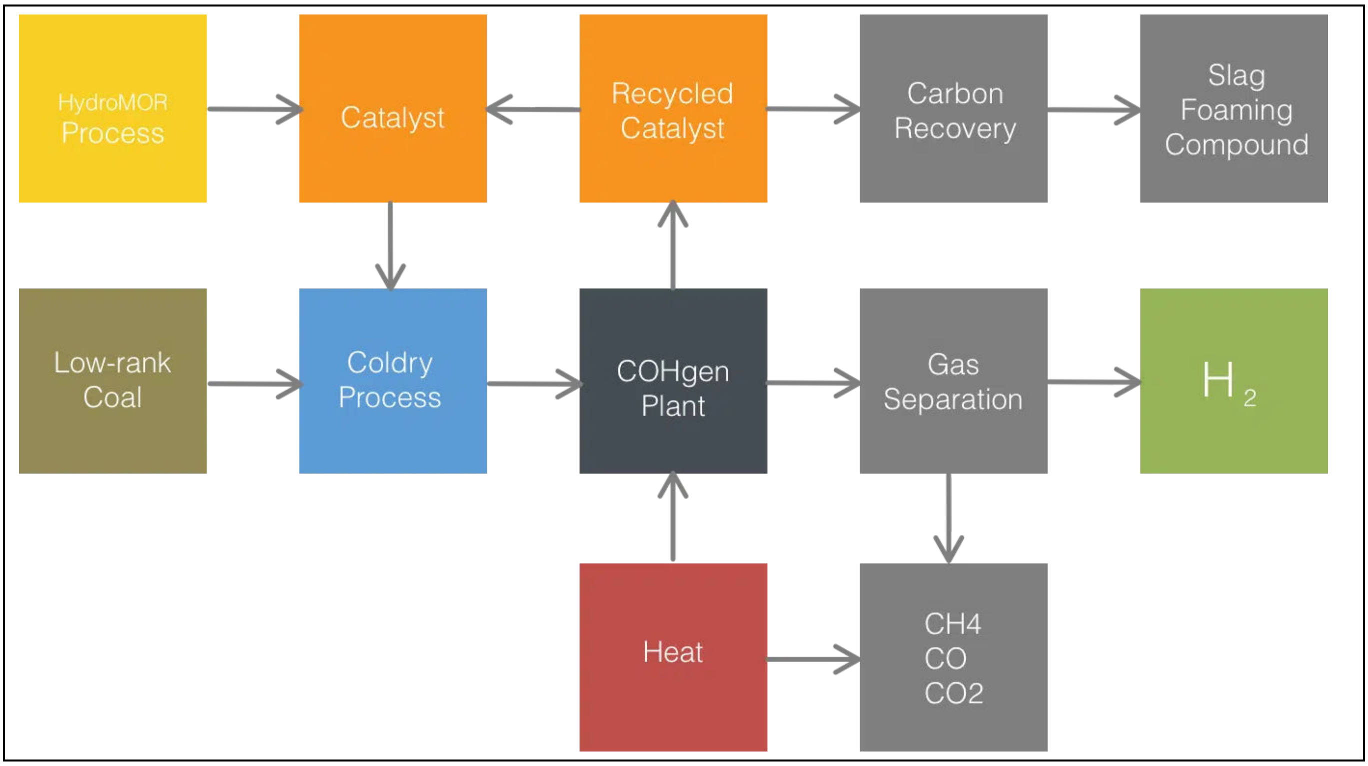
Appendix III: ECT COHgen platform

COHgen is ECT's lignite to hydrogen process that uses a lower temperature, catalyst driven pathway instead of conventional high temperature coal gasification. The intent is to lift hydrogen yield while improving the cost and emissions profile. By operating at lower temperatures, the process is designed to reduce operating costs and improve energy efficiency. ECT also highlights a potential emissions advantage: around 60% to 70% of the carbon generated is deposited as a solid rather than being released as CO2[62]. If achieved at scale, this could lower the amount of carbon capture and storage required, and therefore reduce the cost burden associated with carbon management.

In practical terms, the process works as follows displayed in (Figure 18)[63]. Lignite is first used to generate hydrocarbon vapours. These vapours are then passed through a catalyst, which helps decompose the hydrocarbons at lower temperatures and produces a hydrogen rich gas stream. A material portion of the carbon ends up as a solid deposit instead of converting into CO2, which ECT positions as a core economic and emissions advantage. ECT states they are still in lab scale work, but they do claim higher hydrogen yield at lower temperature than standard lignite gasification.

[62] Environmental Clean Technologies Limited (ECT) *COHgen*.
[63] Environmental Clean Technologies Limited (ECT) COHgen Detail.

Figure 18: How the COHgen process works



Source: company

The economic value of hydrogen rich gas streams

The main output is a hydrogen rich gas stream, which industrial users can monetise in two primary ways. First, industrial companies can sell the hydrogen as a product. Hydrogen is a core input for ammonia production and is widely used across downstream industrial processes, including metals, chemicals, and refining. Second, the hydrogen can be burned as a source of process heat. This creates a practical decarbonisation pathway for existing operations that currently rely on natural gas or coal for thermal energy[64]. In both cases, economic value is typically realised through a long-term offtake contract, where the buyer pays a contracted price per kilogram of hydrogen, and the producer focuses on optimising the delivered cost per kilogram through efficient, reliable production.

[64] See "The process & how it works." Environmental Clean Technologies Limited (ECT) (n.d.) COHgen Detail.

Appendix IV: Analyst certification

Stuart Roberts, lead analyst on this report, has been an equities analyst since 2002.

- Stuart obtained a Master of Applied Finance and Investment from the Securities Institute of Australia in 2002. Previously, from the Securities Institute of Australia, he obtained a Certificate of Financial Markets (1994) and a Graduate Diploma in Finance and Investment (1999).
- Stuart joined Southern Cross Equities as an equities analyst in April 2001. From February 2002 to July 2013, his research speciality at Southern Cross Equities and its acquirer, Bell Potter Securities, was Healthcare and Biotechnology. During this time, he covered a variety of established healthcare companies, such as CSL, Cochlear and Resmed, as well as numerous emerging companies. Stuart was a Healthcare and Biotechnology analyst at Baillieu Holst from October 2013 to January 2015.
- After 15 months over 2015–2016 doing Investor Relations for two ASX-listed cancer drug developers, Stuart founded NDF Research in May 2016 to provide issuer-sponsored equity research on ASX-listed Life Sciences companies.
- In July 2016, with Marc Kennis, Stuart co-founded Pitt Street Research Pty Ltd, which provides issuer-sponsored research on ASX-listed companies across the entire market, including Life Sciences companies.
- Since 2018, Stuart has led Pitt Street Research's Resources Sector franchise, spearheading research on both mining and energy companies.

Charlie Youlden is an associate equities research analyst at Pitt Street Research.

- Charlie holds a Bachelor of Business and Commerce from the University of Technology Sydney. He has also completed the Value Investing Program at Columbia Business School and the Wall Street Prep Financial Modeling course.
- He joined Pitt Street Research in 2025, following experience as the founder of his own business and as an FX hedging broker.
- Charlie has authored equity research reports on ASX-listed and US technology companies and actively shares market insights with a growing professional audience.

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