HILT CRC Response on:

Emissions Reduction and Resilience Plan for Tasmania's Industrial Processes and Product Use Sector

7 October 2024

About HILT CRC

The heavy industrial sector contributes significantly to the Australian economy, with an annual direct economic output of approximately $140 billion, representing around 9% of the national economy. However, the sector is also carbon intensive, with the iron/steel, alumina and cement/lime sectors alone accounting for approximately 9% of Australia total CO_2 emissions, and the global downstream processing of Australia's resources accounting for three times all of Australia's direct emissions.

Tasmania has a particularly substantial heavy industry presence, as represented by the Industrial Processes and Product Use (IPPU) Sector. As summarised in the IPPU State of Play report, it contributes directly to ~1.5 Mt CO2 equivalent emissions per annum, as well as contributing significant emissions indirectly via the transport and energy sectors, and is "critical to Tasmania's economy and are a key provider of high paying and skilled jobs."

The IPPU sector is well placed to decarbonise in Tasmania given the state's already high renewable energy penetration and commitment to increase this to 200% by 2030. However, as recognised in the IPPU Emissions Reduction and Resilience Plan, while some progress has been made in the decarbonisation of Tasmania's heavy industries, further innovative technologies and transformative processing pathways are required to meet 2050 net zero emissions targets.

The Heavy Industry Low-carbon Transition Cooperative Research Centre (HILT CRC) was created as a catalyst to propel Australia's heavy industries towards a sustainable future. Through industry-led research, HILT CRC endeavours to mitigate risks and pave the way for effective decarbonisation strategies with a focus on the iron/steel, alumina and cement/lime sectors. Since commencing operations in November 2021, HILT CRC has successfully embarked on groundbreaking research in collaboration with over 60 Partners across industry, research organisations and government, and currently has 25 active research projects underway.

Grange Resources is one of HILT CRC's Core Industry Partners and also one of the significant companies within the Tasmania IPPU sector. Grange is an active participant in HILT with involvement in almost all our iron/steel projects and the lead industry member in two projects regarding the use of hydrogen for heat in industrial processes. Although Cement Australia is not currently a Partner in HILT, we have a number of projects relevant to the cement sector including the use of biomass and other alternative fuels for industrial processes, carbon capture and utilisation options for industry in general and the cement industry in particular and the use of supplementary cementitious materials to reduce emissions. We have also recently launched a flagship project investigating energy infrastructure optimisation for decarbonisation, which is relevant to all heavy industry and will include assessment of Northern Tasmania as one of its case studies.

Ray Mostogl, CEO of the Tasmanian Minerals, Manufacturing and Energy Council (TMEC) is also a member of HILT CRC's independent board. Many of the key messages are consistent in HILT and TMEC's responses to the draft Emissions Reduction and Resilience Plan for Tasmania's IPPU Sector.

Figure 1 illustrates the core sectors HILT CRC is focussed on, the key technologies, decarbonisation pathways and interlinkages between them. Our projects that are relevant to these technologies and enabling actions are shown in Figure 2.

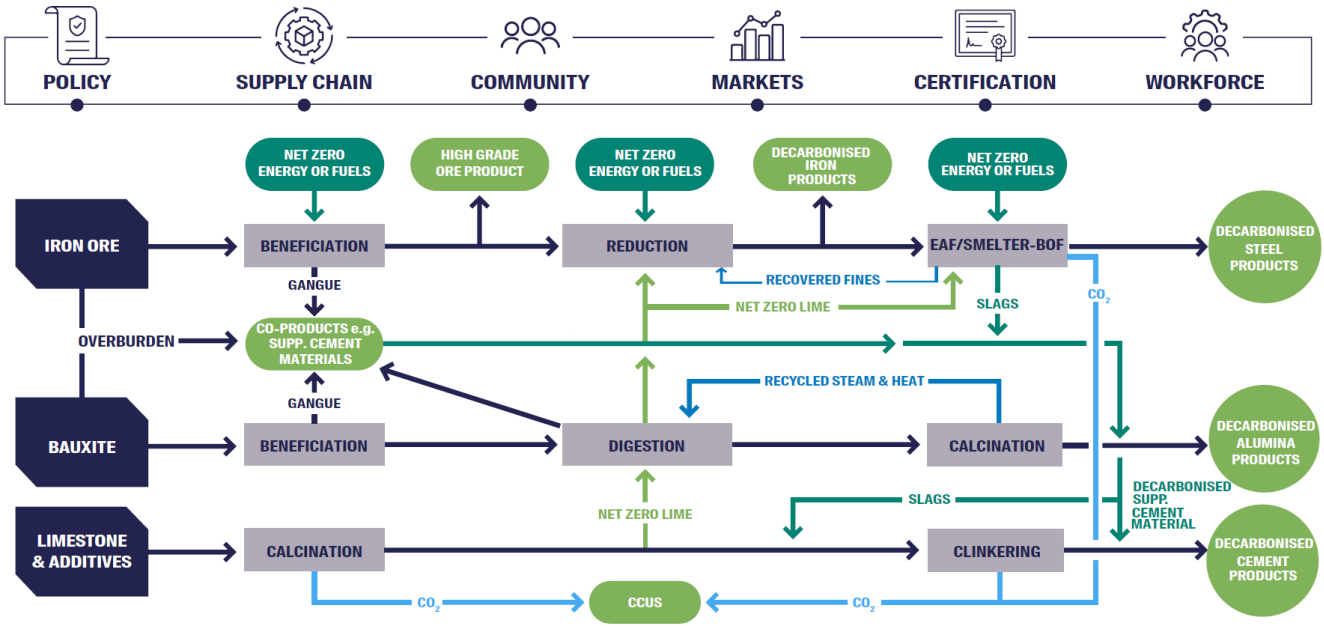

Figure 1: *HILT view on decarbonisation pathways for its focus industry sectors and key technology platforms for decarbonisation.*

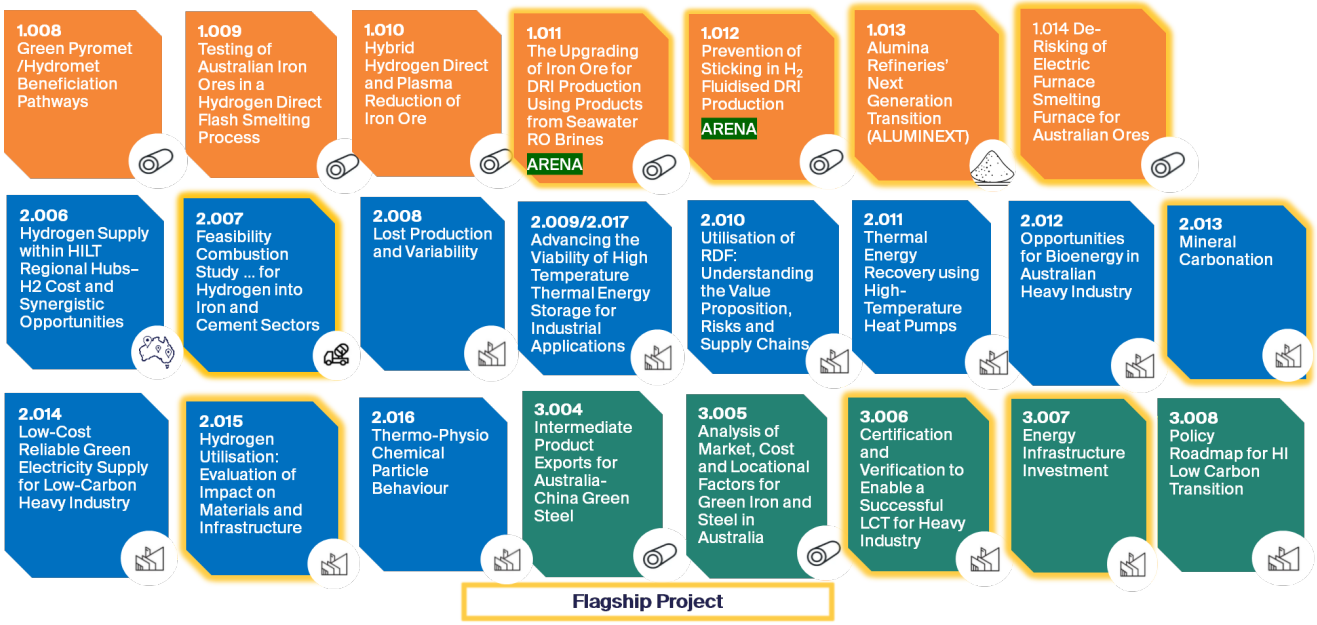

Figure 2: *HILT CRC current projects: orange = Program 1 (Core processing technologies), blue = Program 2 (cross-cutting technologies) and green = Program 3 (facilitating transformation).*

HILT CRC's Response

HILT CRC welcomes the opportunity to respond to the Tasmanian Government's consultation paper seeking input to the draft Emissions Reduction and Resilience Plan for Tasmania's Industrial Processes and Product Use Sector.

We acknowledge the excellent work done by Renewables, Climate and Future Industries Tasmania (ReCFIT) within the Department of State Growth, in preparing the IPPU State of Play report and comprehensive draft Emissions Reduction and Resilience Plan.

HILT's Key Messages in response to the draft Emissions Reduction and Resilience Plan are:

- Tasmania's opportunity is significant from both an economic and global emissions reduction perspective.
- Tasmania's IPPU sector has the opportunity to supply emerging markets for net zero products, but it must compete globally competitive with producers in other jurisdictions. Furthermore government and industry need to work together to attract the investment needed to deploy decarbonisation technology.
- Access to low cost, reliable, renewable / low carbon energy and energy infrastructure at scale is a significant challenge identified by our partners. Hence for the IPPU sector to decarbonise it needs additional net zero energy at globally competitive cost.
- New production technology relevant to the transition of Tasmania's IPPU sector will mostly come from overseas suppliers, but need further derisking for implementation in Tasmania. Coordination, knowledge sharing and collaboration between government, industry and research organisations is essential to attract and de-risk this technology.
- HILT has a broad research portfolio aimed at addressing these challenges, which can assist Tasmania's IPPU sector in delivering the Tasmanian Government's Emissions Reduction and Resilience Plan.

HILT CRC has also engaged extensively with Australian Federal Government departments and agencies recently on related submissions, in particular:

- Department for Industry, Science and Resources:
    - Consultation on Green Metals: A Future Made in Australia: Unlocking Australia's Green Iron, Steel, Alumina and Aluminium Opportunity
    - Net Zero Industrial Sector Plan
- Department of Climate Change, Environment, Energy and Water
- Climate Change Authority 2024 Issues Paper: Targets, Pathways and Progress
- Net Zero Economic Agency

Copies of documents provided to these Departments can be provided upon request.

Questions and HILT Response:

What future opportunities do you think will have the most impact on the IPPU sector in Tasmania?

The opportunities that HILT thinks will have the greatest impact on the IPPU sector in Tasmania are:

Market factors:

Tasmania's IPPU sector is heavily export orientated, both internationally and to mainland Australian customers. As such, evolving customer requirements, changes in international markets and Australian and international government trade policies will have a significant impact on the Tasmanian IPPU sector both from a decarbonisation point of view and global competition. This will include global demand for and competition to supply net zero products such as:

- Green iron from magnetite resources, as an input to global green steel supply chains,
- Net zero aluminium,
- Low carbon cement, and
- Hydrogen and other net zero fuels.

Tasmania's IPPU sector has the opportunity to supply these markets but must also remain globally competitive with producers in Australia and other jurisdictions internationally.

HILT CRC has investigated the influence of market factors on heavy industry in completed and current projects:

- RP3.003: Trade and regulatory issues in Australia's heavy industry low carbon transition
- RP3.004: Intermediate product exports for Australia-China green steel
- RP3.005: Analysis of market, cost and locational factors for green iron and steel in Australia
- Project RP3.006: Certification and verification to enable a successful LCT for heavy industry

Key outcomes from these projects relevant to Tasmania's IPPU sector are:

- The top 10 export industry competitors for Australian iron, steel and aluminium products are China, Germany, India and USA.
- China, USA, India, EU and Germany had the highest number of trade policy measures implemented to support their domestic iron/steel and alumina/aluminium industries in descending order.
- Australia's key future opportunity to supply clean processed products into international markets is likely in the form of green iron, supplied as an intermediate input to traditional steel making countries
- The outlook for Australian exports of green iron to China depends strongly on the relative costs of green hydrogen, and therefore renewable electricity, in Australia versus China.
- The appetite for green steel varies significantly across Europe, North America, and Asia, driven by differing regulatory environments, market demands, and industry commitments.

- A better understanding of future demand of green metals is key to reducing the low-carbon transition risk for heavy industry.
- The development of "green product value" – a premium to offset the high cost of investment in new plant – is required, which in turn requires processes for regulation and certification
- HILT CRC Partners have identified policy risk and uncertainty as a major barrier to investment in decarbonisation technology and equipment. Hence HILT has initiated a new project: RP3.008 Policy Roadmap for a Heavy Industry Low Carbon Transition, to identify policy measures that can be implemented to support heavy industry decarbonisation.

Ability to attract and secure investment:

Heavy industrial processes such as Tasmania's IPPU sector are capital intensive industries with generally long lifetime assets. Hence the scale of investment needed for retrofits and/or new plants will be significant and therefore it is likely that international investments will be needed, and these plants will have to compete globally to be the most attractive destination for this investment.

Outside of Tasmania (and Australia), environments with significantly lower capital costs, lower regulatory risk and greater access to green energy exist, which provide additional significant barriers for projects. Furthermore, Australia is a very high-cost country and incentives will likely be needed to make investment globally attractive.

HILT held industry roundtables across Australia in 2024. Specific suggestions arising these roundtables relevant to this challenge are:

- Reduce financing risk and cost of capital via the use of public partnerships and public ownership,
- Providing financial support for projects attract investment (grants, production tax credits), and
- Understand investment risk profiles for deploying and developing clean technologies required for decarbonisation.

Technology development and de-risking for Tasmania's IPPU sector:

The technology required to successfully decarbonise heavy industry, such as Tasmania's IPPU, is at different stages of technology readiness and commercial viability. The development and cost of such technology relevant to Tasmania's IPPU sector may have a significant on the impact the future of Tasmania's IPPU sector.

HILT CRC and its partners are addressing priority areas to de-risk and develop technology to enable heavy industry to successfully navigate the decarbonisation journey. In particular these include:

Program 1 – Processing Technology – focusses on two overarching classes of technology – beneficiation and reactor technology – within a series of projects that develop and integrate more specific technologies.

Program 2 – Cross Cutting Technology – supports the integration of two technology platforms that span different industries – energy technology and circularity (including carbon capture and utilisation) – through a series of projects that support a range of other applications and technologies.

Program 3 -Facilitating Transformation - addresses the broader processes needed to facilitate the low-carbon transformation.

In addition to technology maturity and cost, the majority of emerging technology relevant to decarbonising Tasmania's IPPU sector will come from overseas. Hence the ability to access or attract such technology to Tasmania as well as supply chains risks may impact the future of the IPPU sector. Furthermore, such technology also needs to be re-risked for implementation at Tasmanian operations.

Defining impact:

The opportunity and risk for Tasmania's IPPU sector is significant from both an economic and global emissions reduction perspective. However, these opportunities and risks span different scales and hence we suggest the Tasmanian Government consider these future opportunities in the context of what form and where the impact (positive and negative) may take, i.e.:

- Emissions reduction?
- Economic impact?
- Geographic impact:
    - Local: Regional
    - State: Tasmania
    - National: Australian
    - Global

Are there any priorities or future opportunities for the IPPU sector missing from the draft Plan?

HILT CRC endorses the overall analysis in the IPPU State of Play report that:

> *The key consultation themes highlight that there is no one-size-fits-all approach to reduce emissions and build resilience in the IPPU sector. A holistic, flexible approach is required to meet the diverse needs of Tasmania's major industrial businesses and ensure we can make the most of opportunities presented by emerging technologies.*

As such, HILT broadly agrees with the key priorities and opportunities identified in the draft Plan, but suggests some refinements based on our research projects and stakeholder engagement.

Energy

Access to low cost renewable / low carbon energy and energy infrastructure is the most significant challenge to decarbonisation as identified by our partners. For example, when asked during a survey at the 2023 HILT Conference: "What do you think are the key enablers HILT should prioritise to support Heavy Industries' decarbonisation transition", the top answer from HILT's partners was "affordable clean energy." As such, understanding the costs and requirements for the provision of clean, firmed, reliable energy has been a focus of HILT research projects, including:

- RP2.001: Green hydrogen supply modelling
- RP2.006: Hydrogen supply within HILT regional hubs
- RP2.003 Green heat for industry
- P3.007: Unlocking energy infrastructure investment in industrial hubs

The IPPU sector in Tasmania is well placed to decarbonise given the state's already high renewable energy penetration and plans to increase this. However, the low carbon transition for the IPPU sector will significantly increase demand for net zero energy, particularly electricity, and hence require further significant investment in enabling infrastructure. HILT CRC is beginning the process of developing scenario-based assessments to address this question based on multi-stakeholder assessments.

While this may be covered in the Energy Plan, we feel it is important to reiterate in HILT's response to the IPPU sector, due to its significance for our partners.

Investment in Enabling Infrastructure

HILT hosted a series of Roundtables with stakeholders, including industry partners and government representatives, across Australia in 2023 to discuss non-technical barriers holding back the deployment of decarbonisation technologies. These roundtables identified four key priority themes for non-technical barriers to the transition:

- Enabling infrastructure
- De-risking decarbonisation investment
- Policy signals and enablers
- Trade barriers and market drivers.

The provision of enabling infrastructure is crucial to support a successful IPPU sector in Australia including energy infrastructure, roads, rail, water and housing. As industries are likely to dominate the demand for energy and labour in regional Australia, focusing the deployment of shared enabling infrastructure in regional industrial hubs is an efficient option. Investments and development of this infrastructure needs to be staged, in alignment with the progressive transition of the sector.

Specific suggestions arising from the HILT's Program 3 roundtables include:

- Development of framework to assess infrastructure requirements for heavy industry, including regional development opportunities,
- Facilitation and coordination of common infrastructure in industrial hubs,
- Development of frameworks for industry-gov collaboration on shared infrastructure, considering models for co-investment/ownership, and
- Clarity on requirements for social license to enable build out of required infrastructure.

Priority Area 1: Supporting research and development into new technology and production processes.

While new technology for decarbonising Tasmania's IPPU sector will likely be developed overseas, it needs further derisking for the Tasmanian context. For example while magnetite such as mined and processed by Grange Resources can be processed to high grade iron with commercially available beneficiation technologies, as is needed for green iron/steel, such processing is expensive. There are significant opportunities to lower the cost, and water consumption, of beneficiation of magnetite ores with emerging technology. An equally important challenge is how to supply the hydrogen and associated clean energy at sufficient scale and cost for Tasmania's IPPU sector to be globally competitive.

Similarly, other technical challenges such as the supply and integration of Australia's superior renewable energy resources, alternative fuels, carbon capture and utilisation and non-technical challenges, such as policy, regulation, community engagement and workforce development all have unique, local aspects to them.

Priority Area 2: Streamlining regulatory and policy frameworks to support the adoption of low emissions technologies and processes.

As mentioned above, HILT's Program 3 roundtables identified policy signals and enablers as a key barrier to their decarbonisation transition. Further specific suggestions arising from these roundtables relevant to address this barrier and streamlining regulatory and policy frameworks include:

- Accelerate clean energy development by consistent, co-ordinated and streamlined regulations and approval processes across state and federal governments.
- Put in place enabling policies and regulations to assist Australian industry in attracting capital investment, in accessing technology and remaining internationally competitive with their products:
- The need for co-ordinated trade and market policy to support international competitiveness of Australian green products.
    - HILT investigated regulatory and policy needs in RP3.003: Review of trade regulatory implications, which identified key international competitors and reviewed their trade regulations. In particular, it identified the aluminium sector as being heavily affected by government interventions including subsidies, import tariffs and regulatory measures.
    - The need for green product certification and regulation: leading to a new project: RP3.006 Certification and verification to enable a successful LCT for heavy industry.
    - Use Government purchasing agreements / procurement contracts to create demand for green products, and
- Consistent, co-ordinated and streamlined regulations and approval processes across state and federal government so they do not overlap, clash and/or cause regulatory burden.
- Ensuring policies such as Safeguard and CBAM support local industry, particularly in sectors where Australia already has a competitive advantage by engaging with local industry to ensure that 'top-down' policy objectives are aligned with 'bottoms up' pathways of what is achievable.
- Long-term (non-partisan) policy commitment and support, commensurate with timescales of heavy industry infrastructure.

Priority Area 3: Supporting the transition to a low emissions economy

The draft Emissions Reduction and Resilience Plan acknowledges the significant importance of developing workforce capability to support the transition of the Tasmanian IPPU sector. HILT has an active education and training program aimed at upskilling and training heavy industry's workforce, enabling skilled personnel to transition to a low-carbon sector.

Our education and training program takes advantage of HILT's highly innovative environment, building capacity for innovation and leadership. The program is end-user driven, with a focus on:

- professional development based on micro-credentials and short courses,
- a suite of postgraduate research, education and training activities, and
- support for course development in industry-relevant undergraduate and vocational education and training programs.

Further actions HILT suggests the Emissions Reduction and Resilience Plan needs to consider is community engagement and the social licence to operate of Tasmania's IPPU sector. HILT's Program 3 has identified that community education and engagement regarding the significant changes and opportunities that will accompanying the transition of heavy industry and its supply chains, infrastructure and jobs is a significant risk.

Priority Area 4: Driving action through partnerships, collaboration and information sharing between governments, industry and key stakeholders.

The key steps HILT CRC anticipates industry will take to reduce emissions are:

1. Install 'transitional' technologies or low-carbon solutions for retrofits or brownfield installations to manage the risk of new technologies and the high capital cost of new plants.
2. Trial 'Transformational' technologies or low-carbon solutions in retrofit/brownfield installations to de-risk various components of a new production process.
3. Install new production facilities, with maximum emissions reduction benefit, once technology is fully de-risked and a robust business case for investment is demonstrated.

Given that the majority of technology for each of the above steps will be sourced from international suppliers, HILT suggests that co-ordinated partnerships between industry, research institutions and government at State and national level are needed – and that a particular focus of this is strategic international partnerships with key countries, where there are complementary strengths to enable win-win (e.g. countries with technology advantages, but resource and renewables constraints such as Germany or Japan) of technology development, de-risking and deployment. Further specific suggestions to address this are included in our response to the final question.

How can we collaborate with industry and business to reduce emissions and build resilience in the IPPU sector?

HILT believes that investment by government, industry and research organisations is needed to establish an eco-system of innovation, understanding and capacity building to accelerate heavy industry decarbonisation. The bespoke nature of both ore resources and large scale mineral processing plants, together with the rapidly changing technology landscape, implies that focussing on a few isolated factors or a single project/sector is a high-risk strategy. It will be much more effective to invest in the establishment of a highly skilled sector that supports collaborations between industry, research, government and community, which builds a comprehensive understanding of how to be at the forefront of a growing industry to process ores and bespoke processing plants with net-zero emissions at scale within a rapidly evolving environment.

The factors that HILT has identified that will accelerate heavy industry decarbonisation and enable Australia and Tasmania to be at the forefront of a growing global industry with net-zero emissions at scale and within a rapidly evolving environment include:

- Investment in a heavy industry innovation ecosystem, specifically funding to co-ordinate research and demonstration facilities, programs and develop international linkages,
- Investment in co-ordinated development of the network of RD&D facilities required for the transition and
- Enhancing knowledge sharing processes and agreements attached to government funding.

Building such an innovation eco-system requires investment in long-term partnerships between industry and research. HILT CRC Partners at the 2023 HILT CRC Annual Conference voted for “co-ordination and collaboration amongst stakeholders” as the number one need from industry need, in terms of RD&D and commercialisation, to de-risk their low carbon transition.

Importantly mechanisms to foster collaboration and knowledge sharing should not be confined to Tasmanian or Australian companies. Heavy industry is truly global in terms of technology, markets and impact. Furthermore, some local companies may find it easier to partner with international companies than Australian ones for various reasons. Hence collaboration and knowledge sharing should also have strategic global links.

HILT CRC is already taking a leadership role to support the decarbonisation of heavy industry by seeking to co-ordinate the research and development needed by its Partners. However, these activities are constrained by its current budget. Our vision is to expand HILT’s activities to co-ordinate knowledge sharing, RD&D facilities and international linkages.

Other comments or feedback

The HILT 2024 Conference will be held in Adelaide on October 17th and 18th. The projects and some of the topics included in HILT’s responses above will be discussed in more detail at the conference.

The HiTemp Forum will be held in Adelaide the week after the HILT Conference (October 21st to 23rd). It will cover similar topics but is open to the public. For more information see.