



The House of Representatives Standing Committee on Industry, Science and Resources

Inquiry into and report on developing advanced manufacturing in Australia.

Smart Energy Council submission – 6 April 2023

Summary

Australia has a huge task ahead to meet our legislated emission reduction goal of 43% by 2030 and to increase our renewable power generation to 82% within the same timeframe. These are targets that can and must be met and will require a whole of government approach.

There are significant headwinds and challenges facing Australia over the next decade including supply chain issues and workforce shortfalls. These challenges must be faced head-on if we are to reach our renewable goals and meet our potential to be a smart energy superpower.

If Australia is to become an advanced manufacturer of renewable energy products the Smart Energy Council recommends a clear focus on the following areas.

- Manufacturing high-energy goods using renewable energy and exporting the goods as a zero-carbon product.
- Manufacturing and exporting renewable energy components such as batteries, solar panels, wind turbines, etc.
- Making hydrogen and ammonia using 100% certified renewable energy sources and exporting it on ships, as we do with LNG now.
- Growing other exports such as engineering expertise and software services.

THE INDEPENDENT BODY FOR THE SMART ENERGY INDUSTRY IN AUSTRALIA

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**PUTTING ENERGY
INTO ACTION**

A decorative graphic consisting of several parallel, slanted green lines of varying lengths, creating a sense of movement and energy, located in the bottom right corner of the page.

There is a clear abundance of resources, a competitive advantage in technical know-how, and a sector that is up to the challenge of delivering on these areas of focus. What is needed is a clear plan, a pipeline of priorities and investment, and a commitment to achieve these goals.

The Smart Energy Council supports the newly established Climate Capital Forum which recently outlined a zero emissions vision for Australia's future, and an outline of the policies and practices that need to be put in place to achieve this vision including what that means in an advanced manufacturing context. The forum's recent report entitled: Modernising and decarbonising our economy to position Australia as a Global Leader in Zero Emissions Trade and Investment outlines critical issues to build a strong future economy and long-term job opportunities that will benefit Australia and our region. The full report can be found here: <https://smartenergy.org.au/articles/climate-capital-forum-discussion-paper/>

The Smart Energy Council is pleased to provide this submission and would welcome the opportunity to appear before the committee.

About the Smart Energy Council

The Smart Energy Council is grateful for the opportunity to provide a submission to the House of Representatives Standing Committee on Industry, Science and Resources Inquiry into and report on developing advanced manufacturing in Australia.

The Smart Energy Council is Australia's peak independent body for renewables including solar, batteries, and green hydrogen. The council has over 950 members and 65 years of experience in the sector having been established by the photovoltaic pioneers in the 1950 and 60s who designed and built some of the world's first solar panels and solar hot water systems.

The Council understands Australia's transition to a net-zero emissions economy will deliver massive business and economic benefits; it will deliver jobs, attract investment, innovate, and make our economy more productive and competitive, all while delivering a safer climate. Achieving a strong economy and a safe climate is not just possible, it is critical if we are to confront the challenges of the future.

We actively connect the smart energy industry across Australia, building momentum and unlocking the barriers that hold us back from embracing a smart energy future.

The SEC's 950+ members provide us with real-world, empirical insights via thematic working groups which assist the SEC with drafting, testing and advocating for fit-for-purpose smart energy policy. The discussion and outputs of the SEC working groups provides the basis of the evidence provided in this submission.

With the world's best renewable energy resources, and innovative people and businesses, Australia has the opportunity to be a smart energy leader. As such the Smart Energy Council offers a range of initiatives for consideration.

Summary of recommendations

Recommendation: The Australian Government urgently reviews the Inflation Reduction Act (IRA) and considers what elements of the IRA need to be matched or bettered in order to create the environment for advanced manufacturing in the renewables sector to be viable and to attract investment.

Recommendation: The Australian Government should strongly consider the introduction of an advanced manufacturing tax credit as part of a response to the Inflation Reduction Act.

Recommendation: The Australian Government should acknowledge that Australia has a strategic gap in our ability to supply the products and services needed for our renewable energy supply chains. This gap should be outlined in similar terms to how many days' worth of supply we have similar to the days of oil Australia has available that is reported to the International Energy Agency.

Recommendation: The Australian Government co-invests with the smart energy sector, in industry programs to promote the take up of smart energy jobs throughout our economy.

Recommendation: The Australian Government seek a partner with existing iron ore exporters to develop new methods of processing hematite for its use in green steelmaking.

Recommendation: The Australian Government should partner with states to find viable pathways to extract magnetite, process the product and utilise it in upgraded furnace facilities to produce green steel for domestic use and export. Green, processed magnetite should be promoted as our primary export iron ore product.

Recommendation: The Australian Government develops a strong, multiyear plan of investment based on the need to decarbonise existing key sectors (e.g., steel, aluminium, cement) to ensure their future. A concurrent plan needs to be in place, no later than June 2023, to develop Australia's renewable energy component sector. Raw materials must have value-added onshore before being exported to ensure Australia reaps the rewards of our next minerals boom.

Recommendation: The Australian Government promotes at-scale renewable hydrogen and the implementation of a viable, trusted certification scheme to ensure the value of the product is properly captured.

Recommendation: The Australian Government increases investment in renewable product innovation, design, and development. This investment should be continued and expanded through the existing ARENA grants program mechanisms.

Recommendation: Consider the Smart Energy Councils' budget submission requests including a \$12 billion over 10 years Powering Our Homes package to electrify Australian homes in the context of creating a local market for Australian manufactured goods.

Recommendation: The Government consider a Small-scale Renewable Energy Storage Scheme to promote the uptake of household battery storage. The expansion of the market for household batteries as well as a government incentive for local battery manufacturing is vital for Australia's future grid needs and to meet our emissions targets.

Australia's investment opportunity for its domestic smart energy transition

The Australian Government has committed Australia to reducing its greenhouse gas emissions by 42% by 2030 and to deliver 82% renewables within that same timeframe. We also need a renewable energy storage target to meet this challenge. To put this into perspective Australia produced just 29%¹ of its energy mix from renewables in 2021. There are different calculations underpinning the size of the investment opportunity afforded this decade by the energy transition; from AEMO's \$66 billion in large-scale renewables and \$27 billion in rooftop solar and battery storage² to the Investor Group on Climate Change's \$131 billion.³

The opportunities from our transition are considerable. Just improving and building out a battery supply and manufacturing supply chain, is estimated to be worth as much as \$7.4 billion over the coming years.⁴

The Smart Energy Council has long understood that Australia has some of the best renewable energy resources in the world and the greatest opportunity to become a renewable energy superpower that exports significant amounts of zero-carbon energy to the rest of the world – directly or by being embodied in locally processed and manufactured goods.

With the appropriate policy and investment mix, Australia could become the world's biggest exporter of smart energy within the next 10 years.

The challenge ahead of us

Supply chain constraints

There are headwinds that Australia must navigate to meet our stated goals. The most significant is a shortfall of currently available input resources that is increasing the global price for renewable energy goods in the solar, storage, and wind sector. This has primarily been attributed to the global supply chain being reliant on Asia for most products. Covid related closures in China have seen large disruptions in

¹ <https://www.energy.gov.au/data/renewables>

² AEMO's 2020 Integrated System Plan

³ IGCC, Making the change happen (2022, Sept), <https://igcc.org.au/wp-content/uploads/2022/09/IGCC-Policy-2025-PrioritiesWeb.pdf>

⁴ Accenture (2021, June) Future Charge, <https://fbicrc.com.au/wp-content/uploads/2021/06/Future-Charge-Report-Final.pdf>

that value chain. Demand is also exacerbated by the fact that the markets in which goods are manufactured have regulations that require local demand be met ahead of export. Australia is late to the party and so without negotiating sizeable offtakes from other countries or overseas companies, Australia will be forced to find its own local production to match the ambition and pace of our own smart energy transition.

Seeing our supply chains squeezed means Australia has a strategic obligation to create an onshore advanced manufacturing sector that can supply at least a part of our domestic supply chain needs. Building and maintaining our energy infrastructure in Australia should be calculated in similar terms to the way we calculate our oil reserves now and report them to the International Energy Agency under the 'Agreement on an International Energy Program treaty'.

Recommendation: The Australian Government should acknowledge that Australia has a strategic gap in our ability to supply the products and services needed for our renewable energy supply chains. This gap should be outlined in similar terms to how many days' worth of supply we have similar to the days of oil Australia has available that is reported to the International Energy Agency.

The shortfall of available labour

The scope of the workforce challenge cannot be understated. Australia cannot meet its 43% emissions reduction target by 2030 unless substantially more people can be found, trained, and engaged to work in the sector. Some reports indicate there is a shortfall of up to 15,000 electricians in the system right now and potentially 41,000 engineers not to mention the jobs required throughout to support those roles⁵. Notably, there is almost no data available on shortfalls in manufacturing because most of our renewables are manufactured offshore. According to Reputex's modelling of the Government's Powering Australia policy to transform Australia's energy grid to 82% renewable by 2030 (to meet our national ambition of reducing greenhouse gas emissions by 43%), 600,000 direct and indirect workers are required by 2030. The Smart Energy Council is very concerned that by 2030, without significant intervention and investment, the total workforce deficit will cripple our efforts to transform our energy network.

⁵ Infrastructure Australia (2021, Oct), Market Capacity for electricity generation and transmission projects, <https://www.infrastructureaustralia.gov.au/sites/default/files/2022-05/Market%20Capacity%20for%20Electricity%20Infrastructure%20220511.pdf>

There is a clear need for an all of industry plan to embrace these challenges in order to overcome them and to set Australia up to become a smart energy superpower.

Recommendation: The Australian Government co-invests with the smart energy sector, in industry programs to promote the take up of smart energy jobs throughout our economy.

The Smart Energy Opportunity for Australia

There are obvious benefits for Australia in a smart energy future. Several studies have placed dollar value estimates on what a climate transition coupled with a clear industry plan could mean for the Australian economy. The IGCC September report lists these:

- Deloitte Access Economics found Australia would grow its economy by \$680 billion, increase GDP by 2.6 percent and add 250,000 jobs by 2070 by adopting a comprehensive transition approach.⁶
- The Grattan Institute found Australia is well positioned to develop an export green steel industry and that capturing 6.5 percent of global trade would generate \$65 billion in export earnings and create 25,000 manufacturing jobs in NSW and Queensland.⁷
- ACIL Allen forecast that Australian hydrogen exports could be worth up to \$5 billion by 2040.⁸
- The Office of the Chief Economist projected that by the end of 2025–26, a surge in Australian export earnings of metals used in technologies central to the global energy transition – copper,

⁶ Deloitte Access Economics (2020), A new choice: Australia's climate for growth, <https://www2.deloitte.com/content/dam/Deloitte/au/Documents/Economics/deloitte-au-dae-new-choice-climate-growth-051120.pdf?nc=1>.

⁷ Grattan Institute (2020), Start with steel: A practical plan to support carbon workers and cut emissions, <https://grattan.edu.au/report/start-with-steel/>.

⁸ ARENA (2018), Opportunities for Australia from hydrogen exports, <https://arena.gov.au/assets/2018/08/opportunities-for-australia-from-hydrogenexports.pdf>.

lithium, and nickel – will replace the fall in thermal coal earnings arising from the net zero emissions transition.⁹

The US Inflation Reduction Act

Australia needs a response to the US Inflation Reduction Act (IRA) if it is to have any hope of attracting the capital and the projects needed in the renewables manufacturing sector.

The US Inflation Reduction Act came into effect in August 2022, and is designed to reduce emissions and reform the US energy landscape by creating a solid manufacturing base of renewables products and transforming American homes by helping them switch off from fossil fuels.

The IRA offers direct support to U.S. manufacturing by providing production tax credits for the manufacture of solar panels, wind turbines, batteries and critical minerals processing. It also establishes bonus credits if components are produced domestically, with a new clean electricity investment tax credit for investment in qualifying zero-emissions electricity generation facilities or energy storage technology.

The IRA provides tax credits for household decarbonisation through the conversion of home furnaces and water heaters to heat pumps, the installation of rooftop solar, and energy-efficient retrofits of homes, apartments, and affordable housing.

Minister Husic has been quoted as saying “If you are very quiet, that whooshing sound you can hear is the renewables capital in Australia leaving to go to the US”. The Smart Energy Council knows this only too well with many of our member companies in the process of moving facilities to the US or considering the offering.

⁹ Department of Industry, Science, Energy, and Resources (2021, March), Resources and Energy Quarterly, <https://publications.industry.gov.au/publications/resourcesandenergyquarterlymarch2021/index.html>.

The primary driver for capital flight to the US is the advanced manufacturing production tax credit contained in the IRA. The credits apply to:

- Solar energy components. Solar modules, photovoltaic cells, photovoltaic wafers, solar grade polysilicon, torque tubes, structural fasteners, and polymeric backsheets.
- Wind energy components. Blades, nacelles, towers, offshore wind foundations, and related offshore wind vessels.
- Battery components. Inverters, electrode active materials, battery cells, and battery modules.
- Critical minerals. Aluminium, antimony, barite, beryllium, cerium, cesium, chromium, cobalt, dysprosium, europium, fluorspar, gadolinium, germanium, graphite, indium, lithium, manganese, neodymium, nickel, niobium, tellurium, tin, tungsten, vanadium, yttrium, and other minerals.

The IRA payment amounts for Solar, Batteries and Critical Minerals are detailed in the table below:

Solar Energy Components	Credit Amount
Thin film photovoltaic cells	4 cents per direct current watt capacity
Crystalline photovoltaic cells	4 cents per direct current watt capacity
Photovoltaic wafers	\$12 per square meter
Solar grade polysilicon	\$3 per kilogram
Polymeric backsheets	40 cents per square meter
Solar module	7 cents per direct current watt capacity
Torque tube	87 cents per kilogram
Structural fastener	\$2.28 per kilogram

Battery Components	Credit Amount
Electrode active materials	10 percent of production cost
Battery cell	\$35 per kilowatt-hour of capacity
Battery module	\$10 per kilowatt-hour of capacity
Battery module that does not use battery cells	\$45 per kilowatt-hour of capacity

Critical Minerals	Credit Amount
Any applicable critical mineral	10 percent of production cost

The program involves a phase-out sunset clause where the payments are reduced to 75% for a component sold in 2030, 50% in 2031, 25% in 2032, and 0% after 2032. These payments are uncapped, meaning that the total cost to the US Budget is unknown.

It is now time to consider these payments and to what extent they need to be applied to compete to create our own advanced manufacturing industry. The Smart Energy Council has publicly called for a government response to the IRA and is advocating an Australian version of the advanced manufacturing tax credit policy.

Recommendation: The Australian Government urgently reviews the Inflation Reduction Act (IRA) and considers what elements of the IRA need to be matched or bettered in order to create the environment for advanced manufacturing in the renewables sector to be viable and to attract investment.

Recommendation: The Australian Government should strongly consider the introduction of an advanced manufacturing tax credit as part of a response to the Inflation Reduction Act.

Australia's opportunity to develop advanced manufacturing in the renewables sector.

Australia has a number of options to become take advantage of our renewable energy resources which should be utilised to promote advanced manufacturing.

- Manufacturing high-energy goods using renewable energy and exporting the goods as a zero-carbon product.
- Manufacturing and exporting renewable energy components such as batteries, solar panels, wind turbines, etc.
- Making hydrogen and ammonia using 100% certified renewable energy sources and exporting it on ships, as we do with LNG now.
- Growing other exports such as engineering expertise and software services.

Manufacturing high-energy goods using renewable energy and exporting the goods as a zero-carbon product.

Steel, Aluminium, and Cement

High-energy products such as Steel, Aluminium, and Cement can be produced in Australia utilising low or no-carbon energy fuel stocks and energy sources. The production of these products and marketing as green products will enable Australia to add value to our abundant resources that are primarily exported in their original form. For the purposes of this submission, we will focus on green steel, however, should the committee require more information on Aluminium or Cement we can provide details as needed.

Green steel using an electric arc furnace.

Secondary steel production in an electric arc furnace using scrap metal generates around 90% fewer greenhouse gas emissions than Iron Ore furnace production. By 2050, the International Energy Agency models that 46% of steel could be produced from scrap feedstock, compared to 32% in 2020, as more products reach their end-of-life.¹⁰

Whyalla based Liberty Steel recently announced its coal-based steelmaking will be phased out and a new electric arc furnace installed that will slash emissions by 90 per cent by 2025. Whyalla is changing as a direct result of the safeguards mechanism which imposes caps on the nation's largest polluters, who must cut their emissions by a cumulative 28.5 per cent by 2030.

More of these plants should be encouraged and should make up a large part of Australia's plan for a circular economy.

Hematite v Magnetite Iron Ore for green steel

Traditionally most of our iron ore is exported in its raw form missing a significant proportion of the value created from the product. Australia has two primary iron ore types, hematite, and magnetite. Hematite has an iron content of between 56 and 62 per cent while magnetite is a lower grade containing between

¹⁰ International Energy Agency (2021), Net Zero by 2050: A Roadmap for the Global Energy Sector

25-40 percent iron. Hematite constitutes around 96 per cent of Australia's current iron ore exports and is generally shipped in a raw form. Magnetite represents the remaining 4 per cent of our exports but is processed into pellets that can then be used in steelmaking, this process means that the final product has a higher iron content¹¹.

Hematite is not suitable for electric arc furnace steel production and requires additional R&D to get the process right to produce the product with a combination of electricity and hydrogen. This can and should happen if Australia intends to continue to mine our vast swathes of Hematite reserves.

Recommendation: The Australian Government seek a partner with existing iron ore exporters to develop new methods of processing hematite for its use in green steelmaking.

Alternatively, Australia could expand its current magnetite exploitation with a view to processing, using the product to create green steel using electric arc furnace processes. The steel could be used for domestic purposes with a view to export some of the product and the offtake processed magnetite could be exported still with a value-add component. Magnetite is currently underdeveloped in an Australian context, but Geoscience Australia estimates that it represents around 30 per cent of the total available iron ore remaining in Australia. South Australia's iron ore deposits are 90 per cent magnetite and around 81 percent of Australia's magnetite is in Western Australia.

Recommendation: The Australian Government should partner with states to find viable pathways to extract magnetite, process the product and utilise it in upgraded furnace facilities to produce green steel for domestic use and export. Green, processed magnetite should be promoted as our primary export iron ore product.

¹¹ Australian Industry Energy Transitions Initiative – Phase 3 report, February 2023

Manufacturing and exporting renewable energy components such as batteries and solar panels and green hydrogen electrolyzers

The Smart Energy Council acknowledges an industry plan and urgent investment is required to ensure our existing manufacturing industries can transition to renewable fuel stocks. Renewable steel and aluminium are key to this idea but so is the use of low-carbon products in the construction sector such as concrete and other building materials.

The Smart Energy Council firmly supports an Australian-made manufacturing sector for all elements of our renewables value chain. Australia's abundant supplies of lithium and nickel, key components in battery manufacturing, mean the country is uniquely placed to build out a sector that can supply a significant proportion of the world's needs for energy storage for decades to come. Australia has a long history of successfully mining raw materials and exporting them for value-add overseas. In this next phase of Australia's story, we must move up the value chain and produce more of the end products onshore capturing more of the benefits from these minerals for the advancement of all Australians.

Investment in our existing manufacturing base and in new smart energy componentry in Australia is critical to the success of Australia's transition to becoming a smart energy superpower.

Solar Manufacturing

Australia currently possesses a very limited domestic solar manufacturing industry with just one operator still producing products in South Australia. Australia should have the capability to produce the basic materials of a solar panel including the tempered glass, the silicone solar cells, and other component materials. Given Australia will soon be reliant entirely on imports for a product that makes up over 12% of our current total power generation and sits on the rooftops of almost 3.3 million homes this represents a strategic gap that must be filled.

There are a number of current operators that are Australian based however they manufacture solar panels and components overseas. Some of these manufacturers are fast becoming world market leaders in their niches. Many of these companies would very much like to produce all or some of their

products in Australia. With some investment from the recently legislated National Reconstruction Fund, these manufacturers could easily onshore some or all of their product manufacturing.

Battery Manufacturing and Lithium mining

The global market for lithium Batteries is expected to hit around \$100 billion by 2025 with around half being used in EV batteries and the remainder split between increasingly popular household batteries for behind the metre storage and in other consumer products such as drills, vacuums, etc.

In Australia, we possess significant volumes of high-quality lithium, potentially the largest deposits in the world in terms of accessible deposits. We also possess an obvious competitive advantage in Mining. Currently, Australia is the world's largest producer of unrefined lithium, and we produced \$1.4 billion in exports in 2018–19 (Australian Department of Industry, 2019). The value in 2023 is expected to be \$3.8 billion (statista.com, 2023)

This lithium is mined and sent overseas for value add, similar to other valuable metals we export including iron-ore and to a large extent bauxite.

The obvious value add here is to move our lithium process up the value chain. The Lithium-ion battery value chain consists of the six main stages, which include extraction of raw materials, processing the material, creating active battery cell materials, manufacturing of cells, and recycling the product for reuse.

At an absolute minimum, Australia should be developing lithium mining operations with a view to processing the material before it is exported.

The next phase in the process should be to build the capacity to produce the precursor, anode, cathode, and electrolyte components of the battery construction phase. Australia currently produces nine of the 10 mineral elements required to produce most lithium-ion battery anodes and cathodes and has commercial reserves of graphite which is the remaining element and could easily be exploited. Australia also has secure access to all of the chemicals required for lithium-ion battery production¹².

Significant investment in lithium extraction and processing with a view to building batteries in Australia could and should be a huge boost to the Australian economy. Given the size and availability of the

¹² The Lithium-Ion Value Chain, Austrade 2020

resource in Australia, to some extent, we have a moral imperative to exploit this resource as quickly as possible in order to meet the challenges presented by climate change, at the same time we should be attempting to add value to the Australian economy by offering a cleaner version of the product to the world.

Green Hydrogen

Australia is already shaping up to be a big player in the production of Hydrogen. This industry is in its infancy and needs a strong certification policy that will mean Australia develops its hydrogen industry from clean, green fuel sources and not from other traditional dirty fuel sources such as coal or gas.

In December 2020, the Smart Energy Council launched its Zero Carbon Certification Scheme. It is an industry-led Guarantee of Origin style scheme which promotes the uptake and distribution of renewable hydrogen products and their derivatives in Australia and overseas. The scheme, which will be delivered through the Smart Energy Council's Hydrogen Australia division, will assess the embedded carbon in participating hydrogen, ammonia, and metals produced within Australia.

There is an opportunity to develop and manufacture the many electrolyzers that will need to be built for the industry to use in the production of hydrogen. Because these electrolyzers are relatively simple to build and manufacture, are in very high global demand, and will be needed at scale domestically there is a very real opportunity now to invest in the manufacturing capability to produce the electrolyzers that will power our hydrogen industry.

Recommendation: The Australian Government develops a strong, multiyear plan of investment based on the need to decarbonise existing key sectors (e.g., steel, aluminium, cement) to ensure their future. A concurrent plan needs to be in place, no later than June 2023, to develop Australia's renewable energy component sector. Raw materials must have value added onshore before being exported to ensure Australia reaps the rewards of our next minerals boom.

Making hydrogen and ammonia using 100% certified renewable energy sources and exporting it on ships, as we do with LNG now.

Hydrogen is the most abundant chemical in our world, it can be processed into an energy carrier using a renewable method such as electrolysis, or traditionally through steam reformation.

The produced hydrogen can be safely stored and used in a multitude of ways including in power generation and energy storage, as fuel for hydrogen vehicles, or as a feedstock for chemical products.

In December 2020, the Smart Energy Council launched its Zero Carbon Certification Scheme. It is an industry-led Guarantee of Origin style scheme which promotes the uptake and distribution of renewable hydrogen products and their derivatives in Australia and overseas. The scheme, which is delivered through the Smart Energy Council's Hydrogen Australia division, assesses the embedded carbon in participating hydrogen, ammonia, and metals produced within Australia.

This industry-led initiative is cognisant of the Australian Government's work in this area as part of the National Hydrogen Strategy and will complement international certification work.

Our aim is to accelerate the development and deployment of renewable hydrogen, green ammonia, and green metals in Australia and around the world.

The Smart Energy Council's current certification projects are:

- Bristol Springs Pre-Certification
- Project YURI Pre-Certification
- ACT Hydrogen Refueler Certification

The Smart Energy Council's view is that hydrogen created through renewable power stacks up environmentally and economically in many situations as a viable product for use in Australian industry and export to the world. Properly certified, carbon-free hydrogen can be sold at a premium and once generated at scale will be a significant export earner for Australia.

Recommendation: The Australian Government promotes at-scale renewable hydrogen and the implementation of a viable, trusted certification scheme to ensure the value of the product is properly captured.

Services export such as engineering expertise and software products.

The Smart Energy Council strongly believes that a true strength of Australia's energy sector is its workforce expertise and its innovation products.

Projects such as Sun Cable and CWP Global's Asian Renewable Energy Hub project prove Australia can lead the world in engineering expertise in the global transition to renewables. In the short term, there is a significant deficit of available labour for the domestic build-out. As explained earlier in this submission, this deficit is a critical problem that must be addressed. If this skills shortage can be addressed and the workforce is trained to Australian Standards these workers will be in high demand and our expertise can and will be sought after worldwide. This will see Australian firms bidding for overseas projects and future buildouts.

Our software ecosystem, underpinned by our highly developed university sector is already producing goods that can be marketed around the world. A recent CSIRO partnership with Chinese company Thermal Focus enables the manufacture, marketing, and sale of CSIRO's heliostats, field control software, and design software in China.

In many cases the

Recommendation: The Australian Government increases investment in renewable product innovation, design, and development. This investment should be continued and expanded through the existing ARENA grants program mechanisms.

Other considerations that will lead to an Australian advanced manufacturing sector

Electrifying Households and providing rebates for Australian content

The electrification of our homes and the removal of fossil fuels from everyday lives is a vital part of our transition process, it is also a significant way to reduce household energy costs. The electrification of households over the next 10 years is an incredibly important measure that will allow Australia to stay on track to meet our climate goals because the technology to do this is available and accessible now.

Setting strong home electrifying households targets and including local content provisions in subsidised product offerings would create a local manufacturing boom that would propel our advanced manufacturing sector in the renewables space.

The Smart Energy Council has been calling for a significant focus on electrifying homes and in particular, for a \$12 billion over 10 years Powering Our Homes package to electrify Australian homes and help Australian families get off gas. Recently our budget submission which is available here: <https://smartenergy.org.au/articles/23-24-budget-submission> called for the inclusion of a suite of measures including:

- Concessional finance through the Clean Energy Finance Corporation, including low-interest loans, direct and supported by targeted rebates for smart energy products installed in homes;
- A Low-Income New Energy (LINE) scheme to help low-income earners in public and private housing reduce their power and fuel bills;
- Minimum energy efficiency and climate performance standards and disclosures for appliances, energy services, and rental properties;
- An \$80m national education and communications campaign on household energy performance, solar, storage, and smart energy management;
- A new Powering Our Homes and Businesses Division in the Commonwealth Department of Climate Change to drive home and small business electrification. The Division would also coordinate policy and lead on improving efficiency and coordination across Australian governments; and
- A new Consumer Energy Resources Regulator to ensure Australian homes and businesses obtain quality smart energy products, services, and installations. The \$12 billion commitment, including \$4 billion over the 4-year forward estimates, is consistent with the commitment from the Minister for Climate Change and Energy, the Hon Chris Bowen MP, on 14 December 2022 for a “meaningful and substantial package” of electrification measures in the 2023-24 Federal Budget. Powering Our Homes would generate energy bill savings up to \$3,000 – \$5,000 per household per year in 2030.

Recommendation: Consider the Smart Energy Councils budget submission requests including a \$12 billion over 10 years Powering Our Homes package to electrify Australian homes in the context of creating a local market for Australian manufactured goods.

Small Scale National Energy Storage Scheme

A national Small-scale Renewable Energy Storage Scheme built as an extension to the existing Renewable Energy Target, providing Australian families with energy security would provide a viable local market and allow for the establishment of Australian battery manufacturing facilities to meet local demand.

Collectively, many small-scale storage systems, located behind the meter at the household, commercial, and industrial level, can act in an orchestrated way as a virtual power plant (VPP). This is otherwise known as Coordinated 'Distributed Energy Resource (DER) storage'. This process piece of the renewables puzzle will offer a significant part of the firming needed to shore up the grid.

The Reputex study modelling that underpinned the Australian Government's 82% renewable energy target assumed 8 gigawatts of household battery, which could theoretically also include bi-directional electric vehicles.

If one-fifth of the current 3 million solar homes were incentivised to invest in home storage, averaging 10-kilowatt hours, this would equate to 6-gigawatt hours of capacity, which is a significant part of the 20 gigawatts needed at a minimum to maintain our electricity grids stability as we transition away from fossil fuels.

Australia needs a Small-scale Renewable Energy Storage Scheme now to drive down the cost of household battery storage in much the same way that government solar rebates have driven down the cost of putting solar on 3 million households. This downward pressure on battery prices will see a greater local market created and will lead to battery manufacturing.

Recommendation: The Government considers a Small-scale Renewable Energy Storage Scheme to promote the uptake of household battery storage. The expansion of the market for household batteries as well as a government incentive for local battery manufacturing is vital for Australia's future grid needs and to meet our emissions targets.

The Smart Energy Council is pleased to see this inquiry established and should you wish to talk further about any elements of this submission including having an audience with any of the Smart Energy Council's 950+ organisations already involved in the energy transition helping make Australia and Smart Energy Superpower, please don't hesitate to get in touch.

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6 April 2023