

**Submission to The House of Representatives
Standing Committee on Industry, Science and
Resources: SunDrive Solar**

**Opportunity for Solar Manufacturing in
Australia**

About SunDrive Solar:

SunDrive is an Australian Solar company looking to set up an advanced manufacturing facility in Australia or offshore. Phase one would create about 400-500 direct advanced manufacturing jobs, scaling to 5000+ over time.

SunDrive is currently likely to be only the second solar manufacturer in Australia and looking to build full-scale advanced manufacturing (not just assembly).

Founded in 2015, SunDrive has quickly grown from a UNSW PhD project in a garage to producing the world's most efficient commercial-sized solar cells.

SunDrive early investors include Australian Renewable Energy Agency (ARENA), Grok, Blackbird and Dr Shi Zhengrong. SunDrive recently closed its latest \$21m investment round led by the Clean Energy Finance Corporation (CEFC) and Main Sequence Ventures.

SunDrive's proprietary technology enables the use of copper instead of silver. This technological breakthrough has significant benefits, including:

- **Greater efficiency** = more electricity for every square meter
- Significantly **lower cost to produce** (copper is approx. 100 times cheaper than silver)
- More **secure supply chain**: solar panel manufacturing already utilises about 20% of the world's annual silver consumption, with solar currently producing 1% of the world's electricity today. Solar is already the fastest-growing industrial application of silver globally. By enabling more abundant copper (1000x more abundant than silver), production can be more easily scaled.
- More **environmentally friendly** production – the extraction and refinement of copper generates approx. 90% fewer carbon emissions than silver. Copper is significantly easier to recycle than silver.

Opportunity for Australia

Supporting Australian Solar advanced manufacturing for the domestic market and international export will lead to a boom in the creation of local high-paid jobs, clean and cheap energy for millions of households and millions of tonnes of carbon abatement

Technology

As a nation, Australia has arguably made the most significant scientific contribution to the development of commercial solar photovoltaics (PV) technology, having pioneered solar photovoltaics (PV) technology 30 years ago - 80-90% of today's commercial technology was invented in Australian laboratories (**generating global revenue of AUD 50 billion/yr**).

Australia leads the world in solar adoption, with the highest solar PV penetration per capita anywhere in the world. Despite its world-leading technology development and market uptake, **Australia today has a near non-existent local supply chain of solar cells or modules.**

Every hour there is enough energy from the Sun to power the whole world for an entire year. However, with such an abundance of energy available, **only 1% of global energy needs are currently met by Solar PV.**

Rapid advancements in next-generation technologies have already been demonstrated by numerous Australian research institutions such as the University of New South Wales, the Australian National University, and the University of Sydney, as well as companies such as Sundrive Solar Pty Ltd which in September 2021, fabricated the world's most efficient commercial size solar cell. **Having invented today's commercial solar PV technology, Australia is well positioned to lead the development of next-generation technologies.**

Talent

Establishing a solar manufacturing industry in Australia would also **enable Australia to retain the world's best talent.** Australia has a long and impressive history of training the world's best solar technology experts through universities and R&D centres. Within the past decade, top solar manufacturers in the world have had Australian-trained researchers in senior executive positions at critical stages of company development, including leading companies such as Canadian Solar, Longi, Suntech, Jinko Solar, JA Solar and Trina Solar.

Export opportunity

Australia has an opportunity to develop the most advanced Distributed Energy Resource (DER) network in the world, as well as export vast amounts of solar energy e.g. via HVDC intercontinental cables (such as Sun Cable) or via hydrogen production (such as plans by Fortescue Future Industries). **With the highest solar resource of any continent and large land mass relative to its population, Australia is best positioned to take full advantage of the transition to a net-zero economy.**

Manufacturing, mining, and supply chain job creation

Manufacturing of solar PV technologies would foster the development of new industries and support existing industries, **creating jobs (particularly regional jobs) at an unprecedented scale**. German institute Fraunhofer, estimates **7500 new direct jobs are created for 10GW of solar PV manufacturing from wafer to modules**

Materials such as glass and aluminium – the two largest components by weight in a solar module, could also be produced locally **creating 1000's of additional jobs**. For example, **the amount of Aluminium module framing required for 10GW of Solar PV is approx. 60,000 tons and is equivalent to the entire output production capacity of Capral Aluminium-** Australia's largest producer of Aluminium products with over 900 employees.

Considering solar glass and all other components (encapsulant, backsheet, polysilicon – before wafer), The total jobs for fully integrated manufacturing with local supply chain of materials is approx. **10,000 direct jobs for every 10GW of annual solar manufacturing**.

According to Net Zero Australia, Australia will need 1900GW of solar to reach Net Zero. Australia only has ~27GW currently installed. Australia will therefore **need approx ~60GW of solar every year for the next 30 years to reach Net Zero. That would lead to the creation of up to 60,000 jobs (more than BHP, the world's largest mining company** employing 40 000 people).

Supply chain inputs for solar per GW (approx.):

- **Aluminium: 5.5 kt per GW** of PV for just the module frames. Not include the Al used for mounting rails on rooftops and the Al used in the casings of inverters.
- **Glass: 44 kt per GW** for (2 mm thick) glass-glass modules. About 95-97% of a module's weigh is glass. 700 W solar farm (utility) module require 30 kg+ of glass.
- **Steel: 35-45 kt per GW** for utility scale mountings
- **Silicon: 2.9 - 3.3 kt per GW** (variable based on wafer thickness).
- **Copper:** Rooftop PV: **2.1-3.3 kt per GW**
Utility PV: **2.0-7.4 kt per GW**

Australia's advantage

Manufacturing input/cost/opportunity	Australia's advantage
Material	Large natural reserves for all major materials required for solar manufacturing.
Electricity	In a net zero world, Australia could provide some of the lowest cost green electricity sources worldwide for the manufacturing sector.
Transportation	Local manufacturing of aluminium module framing and solar glass would drastically reduce rapidly increasing transportation and shipping costs.
Market	<p>Significant market for locally manufactured panels:</p> <ul style="list-style-type: none"> - Highest roof-top solar adoption globally - Significant demand for large-scale solar to provide low-cost electricity as key input into value added exports: Hydrogen, ammonia, fertiliser (made from ammonia), elemental iron produced from iron ore - By the end of this decade, Australia will like have the five largest solar farms in the world

In a net zero world, where the emission intensity of every product produced was accounted for, Australia would likely be the best-positioned country in the world to achieve low emissions manufacturing due to its vast abundance of renewable energy resources.

Australia will likely be one of the largest solar markets in the world. Australia will require huge solar and renewable energy to provide low-cost electricity as a key input to value-added export products such as hydrogen, ammonia, fertiliser (made from the ammonia), elemental iron produced from iron ore with electricity used directly and electricity used indirectly to produce hydrogen, and aluminium.

Australian targets

The federal government has a target for the renewable share of the National Energy Market to be 82% by 2030.

According to *Net Zero Australia* (a group of Australian and US universities and consultancy firms), **Australia needs 1.9TW or 1900GW of solar PV to reach net zero. To achieve this, Australia would require approximately a 70x increase in Solar to reach our target.** A more robust local supply chain is critical in a highly uncertain global economy.

An enormous economic opportunity exists to go beyond our own needs, create a solar export market, and turn Australia into a renewable energy superpower.

International comparison

Other major economies are already investing heavily in clean energy security and are either establishing or scaling local solar PV manufacturing capacities, including:

- India (30-35 GW added capacity by 2030)
- US (50 GW production capacity by 2030)
- Europe (20 GW production capacity by 2025)

Policies supporting solar manufacturing

- **USA:** Solar Energy Manufacturing for America Act/ Inflation Reduction Act ('Build Back Better Act').
- **USA:** America Creating Opportunities for Manufacturing, Pre-Eminence in Technology, and Economic Strength Act
- **CANDA:** Investment Tax Credit
- **INDIA:** Production-Linked Incentive Scheme in High-Efficiency Solar PV Modules
- **TURKEY:** Provides higher feed-in tariffs to PV installations that fulfilled certain domestic content requirements
- **CHINA:** free or low-cost finance (often grants from local Governments to establish manufacturing), tax breaks, free or low-cost land/facilities & subsidised electricity.

Advantages of solar/advanced manufacturing tax credits (US & Canadian approach)

Implementing solar/ advance manufacturing tax credits like those in the US Inflation Reduction Act would support establishing a long-term, globally competitive local solar manufacturing industry, including standing up critical elements of a local supply chain.

Solar/advanced manufacturing tax credits directly linked to the production of solar modules/cells would create a competitive environment for:

- **Rapidly standing up a local supply chain for Australian solar manufacturing industry.** The lack of significant scale in the supply chain presents a significant challenge in the early stages of establishing a new sovereign manufacturing capability. Tax credits across the supply chain address this challenge by providing the certainty needed to drive investment decisions that grow or establish critical elements of a local supply chain.
- **Targeted, efficient and equal treatment of potential local manufacturers and companies in the supply chain.** Directly linking tax incentives to real-world PV solar modules/cell production on a per-watt basis delivers the greatest impact for every dollar of taxpayer resources. This approach delivers a clear, consistent and long-term view providing certainty across the industry and to investors.

US advanced manufacturing production tax credit is applied at the following rates across the supply chain:

- Solar Cells – 4 cents / W_{dc}
- Solar modules – 7 cents / W_{dc}
- Solar grade polysilicon – \$3 / kg
- Solar wafers – \$12 / m^2
- Polymeric backsheets – 40 cents / m^2
- Applicable critical mineral (Al, In, Ni, etc), 10% of the production cost

This is a significant incentive to stand up manufacturing of both end product and supply chain inputs. This incentive is then phased out as the industry is established. The phaseout period is:

- 75% for component sold in 2030, 50% in 2031, 25% in 2032, 0% after 2032.

USA: Solar Energy Manufacturing for America Act/ Inflation Reduction Act ('Build Back Better Act')

Provides baseline tax credits for the manufacture of integrated solar panels as well as along its supply chain with a phase-out period.

[Inflation Reduction Act of 2022](#) (informally the 'Build Back Better Act') – has passed both houses of Congress.

The SEMA Act (proposed), sponsored by Democratic Senator Jon Ossoff, was [first introduced to Congress on 21 June 2021](#). It proposed to ['amend the Internal Revenue Code of 1986 \[i.e. US tax code\] to establish the advanced solar manufacturing production credit](#)

Note: Both SEMA & Build Back Better Act contain similar solar manufacturing tax credit policies.

The new tax credit will apply to US-based manufacturing of 'solar components' along the supply chain for producing solar panels, including final manufacture of integrated solar panels (called 'solar modules' in the proposed Act), photovoltaic (PV) cells, PV wafers and solar-grade polysilicon (for input into wafers and thence cells and panels) – each defined technically by the proposed Act.

Different tax credit amounts would be available for each of these solar components. The full credit amount would be available to manufacturers until 2029, then it would rapidly reduce in percentage-based steps, becoming zero from the start of 2031.

Build Back Better act includes 'SEC. 136504. Advanced manufacturing credit. Which will establish a tax credit regime very similar to that previously outlined in the SEMA:

- This will amend the tax code by creating a new Section 45aa 'Advanced Manufacturing Production Credit'. The tax credit model is substantively the same as for SEMA, except it also includes 'wind energy components.' Providing tax credits for the wind turbine supply chain.

(see appendix for key design details (tax credit amounts and phase out schedule) for how the tax credit would operate [according to the text of the SEMA bill](#))

These policies have received a very positive reception from the US renewable energy industry and manufacturers, with peak bodies predicting significant domestic industry expansion as a result of the boosted US Government support.

Industry moves and reactions to the passage of the *Inflation Reduction Act of 2022*

- **CubicPV³**

Build a new 10 GW conventional mono wafer manufacturing capacity in the US

“The IRA represents a titanic shift in the global solar landscape, and the US is poised to become the world’s most competitive location to manufacture solar. We’re excited to have a role in the US manufacturing renaissance while accelerating our business plan and supporting the development of our next-generation tandem module technology,”

[‘CubicPV Plans 10GW of conventional silicon wafer production’ PV Magazine \(16 December 2022\)](#)

- **First Solar**

\$1 billion to build a new 3.5 GW manufacturing facility in the US Southeast. \$185 million upgrade and add additional 0.9 GW in Northwest Ohio

“In passing the Inflation Reduction Act of 2022, Congress and the Biden-Harris Administration has entrusted our industry with the responsibility of enabling America’s clean energy future and we must meet the moment in a manner that is both timely and sustainable,”

[‘First Solar’ – press release](#)

- **Toledo Solar**

Increase annual manufacturing capacity at Perrysburg, Ohio fab to 2.8 GW by 2027

[‘US solar panel producer plans to accelerate production capacity expansion in Ohio to 2.8GW by 2027’ Taiyang news \(Sept 20, 2022\)](#)

- **Enphase Energy**

Open 4 – 6 manufacturing lines in US, between 4.8 GW AC to 7.8 GW AC capacity.

[‘Enphase Reports ... Plans To Enter Domestic Manufacturing In US’ – Taiyang news \(Oct 26 2022\)](#)

- **Mission Solar Energy** (OCI’s US unit, South Korean)

US\$ 40 million to expand module production from current 210 MW to 1GW

“OCI plans to preemptively respond to the growth of the US solar market, which is expected to see increasing demand thanks to the U.S. Inflation Reduction Act (IRA),”

[OCI raises capacity of US solar panel factory from 210 MW to 1 GW – PV Magazine \(Oct 25 2022\)](#)

- **3Sun USA** (Enel green power's affiliate, Italian)

Build a new 3 GW (possibility to scale up to 6 GW) bifacial PV modules and cells production facility

"Recent policy tailwinds from the Inflation Reduction Act have served as a catalyst for our solar manufacturing ambitions in the US, ushering in a new era of made-in-America energy,"

[Enel announces intentions to build solar PV cell & panel manufacturing facility in U.S.](#) – Enel press release (17 Nov 2022)

- **Meyer Burger** (Swiss)

Expansion of around 1 GW of module production capacity in Goodyear, Arizona

[Meyer Burger secures \\$255.2 million to scale up production capacity to 3 GW](#) – PV Magazine (Oct 5 2022)

- **SEG Solar** (Chinese)

Set up a 2GW solar module manufacturing plant in Texas

'Jim Wood, CEO at SEG, said the establishment of the plant now makes sense due to incentives for solar manufacturing included in the US's recently passed Inflation Reduction Act (IRA) and the country's current legislative climate.'

[SEG Solar to set up TOPCon module manufacturing factory in Texas](#) – PV Tech (Sept 21 2022)

Industry reactions to passage of the *Inflation Reduction Act of 2022* [are summarised in PV Magazine here](#). Additional examples of support for this and related legislation are quoted below:

The **[SEMA] bill is supported** by Q-CELLS America, Hemlock Semiconductors, LG Electronics USA, REC Silicon ASA, Wacker Polysilicon North America, Sunnova Energy International Inc., First Solar, Mission Solar, Leading Edge Equipment Technologies, Auxin Solar, Swift Solar, 1366 Technologies, Silfab Solar, Heliene, and the Ultra Low Carbon Solar Alliance.

– [‘Solar manufacturing tax credit is introduced in the Senate’, PV Magazine \(21 July 2021\)](#)

ACORE [the American Council on Renewable Energy] applauds the introduction of the **America COMPETES Act**, which authorizes billions of dollars to construct new solar manufacturing facilities and expand or upgrade existing facilities, and provides additional funding to reinforce grid security. The United States must prioritize the development of a 21st century domestic supply chain for solar technology and this legislation is a fundamental step. These investments **will create thousands of good-paying renewable energy jobs, help the United States remain competitive in the rapidly growing global solar market and ensure the transition to clean energy through domestic production.**

– [American Council on Renewable Energy \(ACORE\) press release, 26 January 2022](#)

Businesses have been planning since last spring when the clean energy tax incentives were first proposed. Consistent with the need for a holistic approach, the proposed tax legislation necessarily focuses on demand certainty, capex support, and production-related incentives, including the **Solar Energy Manufacturing for America Act**. **Now a wave of public statements and announcements is starting to show how strong U.S. solar manufacturing could become.**

Companies such as Enphase, REC Americas, Maxeon, Hanwha Q CELLS, and Meyer Burger are looking to either create new manufacturing capacity in the United States or expand existing facilities. And **SEIA [the Solar Energy Industries Association] is aware of many more leading companies actively contemplating U.S. manufacturing investments.**

SEIA's research team concludes that U.S. solar panel manufacturing alone would vastly expand, and relatively quickly, if the energy tax incentives pass into law, and we have a pretty good record on industry forecasts.

We also expect to see immediate growth in solar inverter, racking, and tracker manufacturing. This will include a lot more American steel in the ground. And the production and manufacturing employees who make all this happen will be in states like Illinois, Wisconsin, Arizona, Ohio, Pennsylvania, Michigan, North Carolina, South Carolina, Washington State, Tennessee, and West Virginia.

Further up the supply chain, we expect new investments in domestic ingot and wafer and cell manufacturing capacity. Ingot plants will present new opportunities to U.S. polysilicon manufacturers who are unfairly blocked from selling into the large market in China. This in turn will lead to business for U.S. silicon metal producers in places like West Virginia, Alabama, and Mississippi.

Clean energy tax incentives will also stimulate investments in new machine tool capacity such as ingot pullers, pick and place machines, and laminators, and from companies that produce solar glass, junction boxes, encapsulants, back sheets, etc. With the right investments we could truly build a broad domestic solar manufacturing base.

– [‘U.S. Solar Manufacturing Poised for Boom if Energy Tax Incentives Move Ahead’, Solar Energy Industries Association \(SEIA\) blog \(30 March 2022\)](#)

The U.S. solar and storage industry and its allies are ramping up a push for Congress to pass a reconciliation bill [the **Inflation Reduction Act**] with historic clean energy deployment and manufacturing provisions. **Over 400 solar and storage companies sent a [letter to congressional leaders](#) today urging them to pass the legislation** as hundreds of clean energy advocates make calls to offices on Capitol Hill. ... The coalition of clean energy businesses, workers, trade groups and advocates are rallying support for a comprehensive suite of policies, including a long-term extension of the solar Investment Tax Credit (ITC) and a standalone credit for energy storage. The ITC is a proven job-creator that is capable of sparking historic levels of solar and storage deployment and is a necessary policy tool to drive growth at the pace required to tackle climate change. Incentives for domestic clean energy manufacturing, namely Senator Ossoff's **Solar Energy Manufacturing for America Act (SEMA)**, are a crucial element of the reconciliation package.

– [‘Over 400 Companies Urge Congress to Act as Solar Industry Rallies for Reconciliation Push,’ SEIA press release \(12 July 2022\)](#)

With the passage of the **Inflation Reduction Act** in the Senate, **solar and storage companies are one step closer to having the business certainty they need to make the long-term investments that decarbonize the electric grid and create millions of new career opportunities** in cities and

towns across the country. **This legislation is the most transformational investment America has ever made in our climate future**, and we are thankful to our members, the clean energy community and every one of our solar champions in Congress for their work to get us to this historic moment.

– [Abigail Ross Hopper, President and CEO of SEIA, 7 August 2022](#)

The Senate’s passage of the **Inflation Reduction Act of 2022** is a historic step toward the clean energy future the American people want, and scientists say we desperately need. The legislation’s landmark investment of \$369 billion in climate and clean energy programs **will help deploy thousands of megawatts of renewable power, create hundreds of thousands of good-paying American jobs, reduce the cost of electric power, and finally put the country on track toward achievement of our climate goals.**

– [ACORE press release, 7 August 2022](#)

American Clean Power Association CEO Heather Zichal said the **Inflation Reduction Act** represents an **‘unprecedented investment in clean energy’ that would ‘supercharge’ the industry and the broader US economy.** ‘This is the vote heard around the world,’ Zichal said. ‘This is a generational opportunity for clean energy after years of uncertainty and delay.’ ... ‘Energy independence and decoupling from overseas inflation factors has never been more important,’ Nextracker founder CEO Dan Shugar said. **‘We urge the House to quickly pass this landmark legislation for President Biden’s signature.’**

– [‘Industry cheers as Senate passes Inflation Reduction Act’, *Power Engineering International* \(8 August 2022\)](#)

CANADA: Investment Tax Credit

[\\$6.7 billion program to provides 30% investment tax credit 2034](#) - including solar PV storage and clean hydrogen. Designed on US solar tax credits.

Refundable tax credit equal to 30% of the capital cost of investments in the following:

- Electricity generation systems including solar PV, small modular nuclear reactors, concentrated solar, wind, and water (small hydro, run-of-river, wave, and tidal);
- Stationary Electricity Storage Systems that do not use fossil fuels in their operation, including but not limited to batteries, flywheels, supercapacitors, magnetic energy storage, compressed air storage, pumped hydro storage, gravity energy storage, and thermal energy storage,
- Low-Carbon Heat Equipment, including active solar heating, air-source heat pumps, and ground-source heat pumps; and
- Industrial zero-emission vehicles and related charging or refueling equipment, such as hydrogen or electric heavy-duty equipment used in mining or construction.

Companies will be incentivized for creating 'good jobs' and those that stick to certain labor conditions can get full 30% credit, and those that do not will be eligible for 20% credit

INDIA: Production-Linked Incentive Scheme in High-Efficiency Solar PV Modules

Provides direct financial incentives, on a competitive bidding basis, for the manufacture high efficiency (solar) modules (this includes a bidding incentive for using domestically produced components). The funding lasts for five years. Funding has recently been increased to encourage higher production geared toward the export of high efficiency (solar) modules.

Apart from the employment benefits, the Indian scheme has produced 54.5GW of manufacturing capacity of solar equipment.

A production linked incentive scheme (PLI) for the [National Programme on High Efficiency Solar PV Modules](#), was aimed at reducing import dependence in a strategic sector like electricity by:

Facilitating domestic manufacturing for the ambitious goal of 280GW of installed solar capacity by 2030, an additional allocation of Rs 19,500 crore [1 crore = 10 million] for the PLI scheme for manufacturing of high efficiency (solar) modules with a priority of fully integrate manufacturing units for polysilicon to solar PV modules will be made.

The PLI was designed to encourage a competitive bidding process by manufacturers of high efficiency (solar) modules (with priority of fully integrated manufacturing units for polysilicon to solar PV modules) in India. Incentives for domestic sourcing of materials were also built into the bidding system. The incentive funding was to last five years.

The PLI was expanded, with proposed enhanced funding to Rs 24,000 crore [1 crore = 10 million], on 1 February 2022 to incentivise the further production of domestic solar cells and module manufacturing by 10,000 MW manufacturing capacity. This is expected to generate an export capacity of solar equipment.

Expected impact: The National Programme on High-Efficiency Solar PV Modules is expected to generate 30,00 direct jobs and 1.2 lakh (hundred thousand) indirect jobs. With the expanded PLI, an additional 10,000 MW of integrated domestic manufacturing capacity of high-efficiency solar PV modules.

Additional policy options for Australia

Potential Australian incentives:

To support an Australian solar manufacturing industry, solar policies (direct solar manufacturing production tax credits or STCs supporting consumer uptake) could be scaled on three criteria:

1. **Efficiency of the solar cell/module produced** - to capitalise and further encourage Australia's leading solar R&D strength.
2. **Sustainable manufacturing rating** - greater incentive for less carbon intense production. Australia has the potential to utilise some of the cheapest renewable energy in the world to power clean manufacturing.
3. **Locally sourced** – greater incentive for locally sourced components to encourage growth and capture more value from Australia's aluminium, glass, mineral and related industries.

If Australia was to adopt a US/Canadian approach of manufacturing tax credits directly linked to production, additional Australian policy design options include:

- Extend production linked tax credit to solar glass. Australian solar glass production is a significant potential domestic and export market. The US advance manufacturing tax credit is available for solar grade polysilicon, solar wafers, solar cells, polymeric backsheet, Solar modules and applicable critical minerals (Al, In, Ni, etc) but not solar glass. An Australian incentive would help establish this industry where Australia has key potential competitive advantages.
- Higher credit or longer phase-out period for local components. The US IRA advance manufacturing production linked tax credits do not have any requirements for using local components.

Australian Small-scale Renewable Energy Scheme (SRES)

Australia does not currently provide direct incentives for manufacturing solar modules or components. Rather the focus is on the production of electricity through solar energy at the household level (largely through imported solar modules) through the Small-scale Renewable Energy Scheme (SRES) with trading of small-scale technology certificates or STCs.

Potential STC Incentives for Locally Manufactured Solar PV Panels:

Under the existing Small-scale Renewable Energy Scheme (SRES), rebates are provided to eligible solar PV systems in the form of Small-scale Technology Certificates (STCs). Depending on the location, system size and installation date, up to 30% rebates can be provided for rooftop solar PV systems in Australia. In 2021, ~3 GW of small-scale solar PV was installed in Australia which equates to an overall value for the STC rebates in 2021 of AUD 1.3-1.8 billion.

To incentivise the adoption of locally manufactured solar PV modules, **STCs could be scaled based on origin of the solar PV modules**. Installation of local solar PV modules would incorporate a multiplier to offer more savings to consumers for local solar systems over imported solar modules. This could be further extended to the performance of solar modules, with larger STCs obtained for higher performing solar modules.

Recommendations:

Australia has the potential to be a renewable energy superpower. With the right policy settings, Australia can also develop a sovereign solar manufacturing capacity to drive the transition with high-quality, high efficiency and low-cost Australian-made solar cells and modules.

Australia has key competitive advantages with the technology, the talent, the material inputs and potentially low-cost renewable energy to sustain a sovereign solar manufacturing capability. A sovereign solar manufacturing capability would create thousands of local high-paid jobs throughout the supply chain, provide clean and cheap energy for millions of households and millions of tonnes of carbon abatement.

Today 85% of the world's solar is manufactured in one country. Recognising this, countries around the world are responding. We now find ourselves in a global race to attract and retain domestic solar manufacturers. The most significant development is the advanced manufacturing production tax credit in the Inflation Reduction Act (IRA).

In order to establish and maintain an Australian Solar Manufacturing Industry and stop the flight of Australian Manufacturing to the US, Australia should:

- **Adopt a policy similar to the advance manufacturing tax credit in the IRA** (as recently done in Canada).

Solar/advanced manufacturing tax credits directly linked to the production of solar modules/cells would create a competitive environment for:

- Rapidly standing up a local supply chain for Australian solar manufacturing industry.
- Targeted, efficient and equal treatment of potential local manufacturers and companies in the supply chain.

Directly linking tax incentives to real-world PV solar modules/cell production on a per-watt basis delivers the greatest impact for every dollar of taxpayer resources. This approach delivers a clear, consistent and long-term view providing certainty across the industry and to investors. providing the certainty needed by industry and investors to drive investment decisions that grow or establish manufacturing and critical elements of a local supply chain.

This policy can have an Australian design with different tax rebates for:

- **Efficiency of solar cell/module**
- **Sustainability/carbon intensity of solar manufacturing process**
- **Level of local content used in the supply chain**
- **Extending rebates to solar glass production**

Appendix

SEMA bill text:

New Section 36C to be added to the US tax code:

SEC. 36C. ADVANCED SOLAR MANUFACTURING PRODUCTION CREDIT.

“(a) IN GENERAL.—

“(1) ALLOWANCE OF CREDIT.—There shall be allowed as a **credit against the tax imposed by this subtitle for any taxable year** an amount equal to the sum of the credit amounts determined under subsection (b) with respect to each solar component which is—

“(A) produced by such taxpayer, and

“(B) during the taxable year—

“(i) sold by the taxpayer...

“(ii) placed in service or operation by the taxpayer or any other person. ...

“(b) CREDIT AMOUNT.—

“(1) IN GENERAL.—Subject to paragraph (2), the amount determined under this subsection with respect to any solar component shall be equal to—

“(A) in the case of an **integrated module**, an amount equal to the product of—

“(i) 11 cents, multiplied by

“(ii) the capacity of such module (expressed on a per direct current watt basis),

“(B) in the case of a **photovoltaic cell**, an amount equal to the product of—

“(i) 4 cents, multiplied by

“(ii) the capacity of such cell (expressed on a per direct current watt basis),

“(C) in the case of a **photovoltaic wafer**, \$12 per square meter,

“(D) in the case of **solar grade polysilicon**, \$3 per kilogram, and

“(E) in the case of a **solar module which is not an integrated module**, an amount equal to the product of—

“(i) 7 cents, multiplied by

“(ii) the capacity of such module (expressed on a per direct current watt basis).

“(2) PHASE OUT.—

“(A) IN GENERAL.—In the case of any solar component sold after December 31, 2028, the amount determined under this subsection with respect to such component shall be equal to the product of—

“(i) the amount determined under paragraph (1) with respect to such component, as determined without regard to this paragraph [**i.e. the credit amount**], **multiplied by**

“(ii) the **phase out percentage** under subparagraph (B).

“(B) PHASE OUT PERCENTAGE.—The phase out percentage under this subparagraph is equal to—

“(i) in the case of a solar component sold **during calendar year 2029, 70 percent,**

“(ii) in the case of a solar component sold **during calendar year 2030, 35 percent, and**

“(iii) in the case of a solar component sold **after December 31, 2030, 0 percent.**

[emphasis added]

“(c) DEFINITIONS AND OTHER RULES.—In this section— ...

“(4) ONLY PRODUCTION IN THE UNITED STATES TAKEN INTO ACCOUNT.—Sales shall be taken into account under this section only with respect to solar components the production of which is within—

“(A) the United States (within the meaning of section 638(1)), or

“(B) a possession of the United States (within the meaning of section 638(2)). ...