



CLIMATE ENERGY FINANCE

## “Truly momentous:” Solar is changing everything, and Australia must seize the occasion

[Tim Buckley](#), Director, Climate Energy Finance

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The pace of change now evident in the global race to solar is truly momentous. As we detail in [our new “Solar Pivot” report](#), the scale of solar installations and its plunging cost has given the world a chance to actually address the climate crisis at the speed the science dictates.

For more than a decade, the International Energy Agency – among many others – has consistently underestimated the rate of solar deployments, as well as the massive deflation of solar generation costs, and accordingly the disruption of the global fossil fuel industry.

That has resulted in the IEA understating the pace of change and failing to capture global decarbonisation momentum, a problem when its forecast trends are relied upon by governments, industry and finance the world over.

For example, the IEA World Energy Outlook 2022 estimates 462 GW of annual solar installs in 2022-2030 under its Net Zero Emissions by 2050 scenario (290 GW under Announced Pledges Scenario).

The market is now increasingly talking of solar installs at double this run-rate by 2030, and the manufacturing capacity for this is being built – right now. The speed of change is momentous.

We are seeing combined momentum on three related fronts: rapid ongoing solar price deflation, multifold increases in solar manufacturing capacity and successive record solar deployments.

This is coupled with the surge in electric vehicles, battery supply chains and most recently, the massive new opportunities to ‘electrify everything’.

In CEF’s view this creates the conditions for a series of global cascading energy, transport and industry tipping points that have the potential to dramatically accelerate the decline of the incumbent fossil fuel industry, and the decarbonisation of the world economy.

The economics of solar power are now compelling, and will only get stronger this decade.

For example, polysilicon prices are down two-thirds since December 2022 to just US\$11/kg in June 2023. As a result, solar module prices have dropped by a third from 2021, to a recent low of just US\$18c/watt.

At the same time, global freight costs have dropped more than 80% since the peak at the end of 2021. Conservatively, CEF expects solar electricity costs to further drop 10% annually this decade, halving by 2030.

There has also been a staggering acceleration of solar deployments. Solar has seen record annual installs every year this past decade, with BNEF estimating that we saw a global record of 268 GW of capacity added in 2022. CEF foresees the world could reach 1,000 GW pa of solar installs this coming decade.

Turning to manufacturing, BNEF estimates solar module capacity at 600 GW in 2022. Announced solar manufacturing expansions will double capacity by 2024-25 with most in China, and three- to fivefold expansions planned in the US, India and the EU (off low bases).

Leading the world by a huge margin, China is set to install 120-140 GW of solar in 2023, and around 260 GW pa by 2030.

It accounts for 40-60% of global annual renewable energy installs including utility and distributed solar. In the first four months of 2023, China deployed 71 GW of new renewables capacity. That is comparable to the total capacity that has been created in our entire history in Australia.

China also dominates solar manufacturing, with 11 of the 12 largest new solar factory expansions at ~20-30 GW per facility, while US and EU facility expansions are one tenth of that, at ~1-3 GW.

And to top that, May 2023 saw China's JinkoSolar announce a vertically integrated solar module manufacturing facility of a staggering 56 GW pa of capacity. In June 2023, the IEA estimates China alone will have 900 GW pa of integrated module manufacturing capacity online by 2024, triple 2021 levels.

In the US, the transformative ~\$800bn Inflation Reduction Act is driving a fivefold expansion in solar manufacturing capacity by 2024 and a doubling of solar installs to 40-50 GW pa to 2030. A solar module import tariff and production credits protect and enhance domestic manufacturing.

India plans to treble solar installs over 5 years to 40 GW pa, has a 40% solar module import duty, and has 110 GW of solar manufacturing commitments driven by its Production Linked Incentive Scheme.

In the EU, solar installs are set to quadruple to 80 GW pa by 2030. The Net Zero Industry Act, designed to strengthen net-zero technologies manufacturing capacity and improve the EU's energy independence in the light of Russia's invasion of Ukraine, is boosting supply chain security. The EU now targets 30 GW pa of solar module production by 2025.

Australia had 30 GW of solar installs at the end of 2022, and is the sixth largest solar market globally. Installs are set to continue at >4-6 GW pa (3 GW pa being rooftop). With appropriate policy settings and capital investment, abundant land, sun and wind enable Australia to position itself as a renewables superpower.

CEF sees unprecedented trade and investment opportunities, in the order of hundreds of billions of dollars, for Australia to "ship sunshine", embodying decarbonisation in its exports by using its solar and

wind energy to process its world-leading critical minerals reserves, and to power manufacturing of energy transition materials.

Australia's reserves of the critical minerals and green metals used to produce cleantech components – some of the largest in the world – give us enormous opportunities to leverage off the US IRA.

Treasurer Jim Chalmers should use the mid year economic update to introduce a solar module production tax credit – time limited for a single decade – so Australia can secure our position in the solar production supply chain by deploying the world's best solar cell technology, developed here by UNSW.

This could see a 1GW per year module manufacturing facility bring 1,000 high value jobs back onshore, and cut our reliance on solar imports from >99% currently to 'just' 80% by 2025, and down to 60% by 2026 with a second facility, again bringing another 1,000 regional jobs with it.

Australia's massive headstart as a global leader in the uptake of distributed rooftop solar enables it to build on this lead and accelerate the rollout of household and business electrification of everything.

As advocated by Professor Saul Griffith, this will bring enormous benefits both in terms of decarbonisation and permanently lower electricity prices, alleviating cost of living pressures.

Supportive policy and public finance must now be deployed at speed and on a scale that matches the unprecedented pace of change and scale of export opportunity available to Australia.

It will de-risk projects and attract significant private investment, and respond to the massive domestic incentives of our trade partners and competitors.

This includes a focused, sizable and urgent Australian response to the US IRA. CEF estimates a \$100bn cumulative commitment by the federal government of strategic national interest capital is needed to crowd-in \$200-300bn of private investment.

The public capital boost could leverage both Australia's \$3.4 trillion private superannuation pool, and massive investments by key trading partners such as [South Korea's POSCO](#) on rare earth refining, [Norway's Yara](#) on green ammonia, [China Baowu Group](#) on Pilbara green iron and [Albemarle US](#) on Australian lithium refining.

Australia has a once in a century opportunity for investment in renewables, exports, technology and employment, including in and driven by solar. It should seize it.