

Bridging the climate financing gap

By: Jennifer Sullo, Managing Director of Asset Management and Investment Solutions and Josh Shrair, Climate Investing Specialist, Earth Finance

September 27, 2023

What Is Climate Finance?

Climate finance¹ is financing – drawn from public, private, and alternative sources – that supports carbon mitigation, removal, and adaptation actions which address climate change. It can be utilized to pilot and scale a broad array of greenhouse gas reduction and removal technologies and innovations. And over time, it will be key to fundamentally replacing carbon-based infrastructure, materials, and energy sources.

We need climate finance to meet our global net zero goals – yet today, there is a massive funding gap. It's estimated that to evolve the global economy by 2050², we'll need approximately \$125 trillion. In the current decade alone, we need to invest roughly \$32 trillion - which we are not currently on track to meet. For example, in 2020, public/private institutions contributed approximately \$632 billion – which is a mere 16% of the climate financing needed to meet our net zero targets. We're facing a gap of over \$3 trillion between now and 2025 just to stay on track.⁴

Given the urgency of our goals and the interest in climate financing from both the public and private sectors, the logical question is, *why aren't we closing the climate financing gap?*

Private investors face significant obstacles.

Private investors have a key role to play in the transition to a net zero world. Yet today, investors face some significant obstacles when trying to deploy capital to finance climate mitigation and adaptation technologies.

The economic environment can slow capital deployment.

The current macro (broad economy), and micro (critical business) environment has a significant impact on when and how investors decide to deploy capital. Some of the considerations investors must weigh when looking to direct capital toward climate solutions are outlined below.

Macroeconomic considerations	Microeconomic considerations
<ul style="list-style-type: none"> - Price Levels. Recent spikes in the price of energy, shipping, raw materials, and labor throughout the global supply chain due to the global pandemic and geopolitical complexities such as the Russian invasion of Ukraine impact the viability of projects that need climate financing. 	<ul style="list-style-type: none"> - Start-up or early-stage climate tech companies have a unique set of barriers to securing funding including (but not limited to): <ul style="list-style-type: none"> o Traditional Production Theory. Capital intensity associated with scaling a nascent technology from an idea to industrial pilot to becoming commercially viable.

<ul style="list-style-type: none"> - Inflation. High inflationary environments globally lead to increased cost of capital. This is exacerbated in emerging market countries where more than half of climate financing is done through debt. - Government. Continued fossil fuel subsidies across many countries remains a barrier for low-carbon projects to be financed in favor of carbon-based ones. - Priorities. Climate-related extreme weather events are occurring with greater frequency and intensity causing governments to focus on near term repairs to necessary infrastructure, which in turn reduces the budget for long-term sustainable development. 	<ul style="list-style-type: none"> o Labor Economics. The material impact of inflation on wages. o Prices of goods. Relatively low margins. o Supply / Demand Equilibrium. Challenging long-term revenue forecasts for emerging technologies
--	--

These considerations can present significant barriers for investors and can slow down the pace at which capital is directed toward climate solutions.

Portfolio implementation can be more complex.

Once investors have identified investments aligned with their broader portfolio objectives – an entirely new set of challenges awaits them.

- **Climate investments can have higher risk profiles.**
When compared to investments in more traditional technologies, new climate technologies can have a higher risk profile and greater tracking error than investors are generally comfortable with.
- **Climate investments don't "fit" into traditional portfolio allocation processes.**
Generally, investors select allocations in line with their core views of the world. For example, within a diversified portfolio, a favorable outlook on U.S. equities might precipitate an overweight position of U.S. equities whereas a negative outlook on core fixed income could result in a portfolio underweight. But where do climate investments fit? Are they their own dedicated allocation (a new piece of the allocation pie) or do they replace certain asset classes (green infrastructure in lieu of traditional infrastructure) or transcend all traditional asset classes (green bonds within the core fixed income allocation and climate-focused equity within the global equity allocation)? Are they public market investments or private market investments or both? It can be incredibly challenging to invest in climate solutions without a natural fit within the portfolio construction process.
- **Industry standards and benchmarking guidance is lacking.**
Greenwashing allegations and convictions have increased in recent years because of evolving regulation, excited marketers, and a litigious environment. Without standardized reporting, relevant financial benchmarking and developed research providing apples to apples comparisons of leading technologies, investors are reticent to commit.

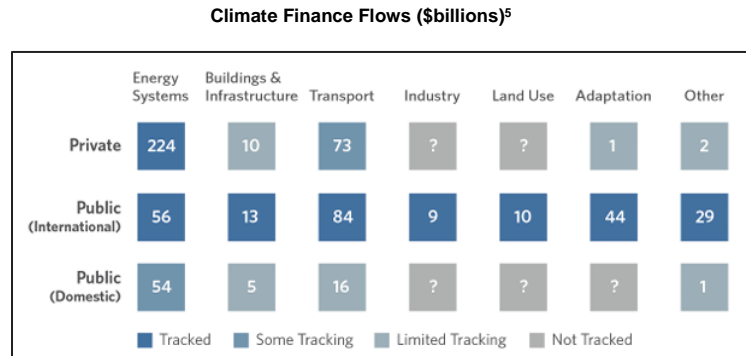
- **Implementation options can be limited.**

Even if an investor has found an opportunity and is comfortable with the risk profile, they still may not be able to access an implementable vehicle. Some opportunities may not be investable due to capital constraints, regional specificity, or liquidity requirements.

Data gaps & methodology issues limit our ability to track progress.

Consistent quantitative data on the impact of climate finance is lacking. Progress in both data and measurement procedures must be made to allow investors to accurately source, diligence, and monitor their investments. For example, data metrics and definitions are not standardized across geographies. So, a climate investment which may be considered in one regulatory jurisdiction may not be considered under another. And for investors interested in deploying capital to private market companies - no streamlined data exists today.

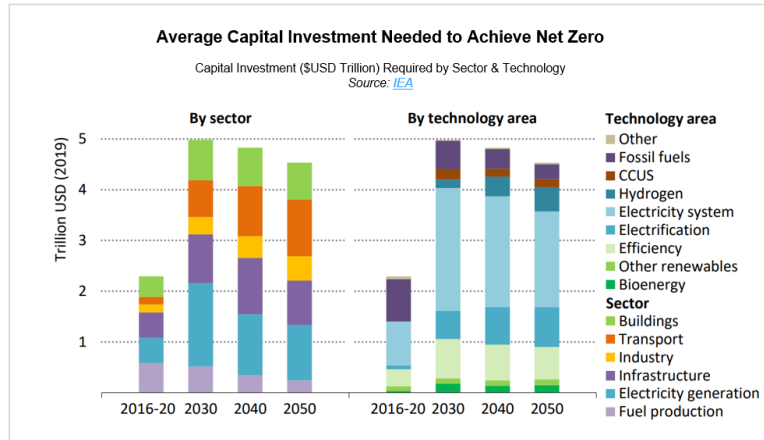
The below graphic represents the dollars of tracked and untracked climate finance by investor type, region, and sector. The numbers in the box represent the average 2019/2020 climate financing flows by sector.



Due to data limitations, non-standard reporting requirements, and difficulty measuring more complex financing deals, there are many instances where financing flows are not being effectively captured. This results in an incomplete and often misleading picture of the climate financing ecosystem. It's challenging to know where to direct climate financing without a baseline understanding of where finance flows stand today.

The challenges are real – and so are the opportunities.

The barriers to entry explored in this section help illustrate why private investments aren't being deployed faster to help close our climate financing gap. That said, investors recognize that this global shift toward a low-carbon economy presents a billion-dollar investment opportunity. From 2019 to 2022 – assets under management in climate funds grew from \$90 billion to more than \$270 billion. This is just the beginning - the technologies and sectors driving significant climate innovation are in critical need of growth capital – and private investors are well positioned to fill this gap.



This evolution across technologies, sectors, and regions presents a highly technical opportunity set – and assessing these opportunities will require investors to bring in cross functional expertise. Investors will need to understand not only the capital markets – but also local, national, and regional policy environments, climate specific sector and company outlooks, and the latest in climate science. Specialized investment managers with the pipelines to source and accurately diligence climate opportunities will have a leg up over others looking to deploy capital toward climate solutions. And as barriers to entry decrease and investors become more sophisticated in this area – the scale and speed of capital moving toward climate finance will only increase.

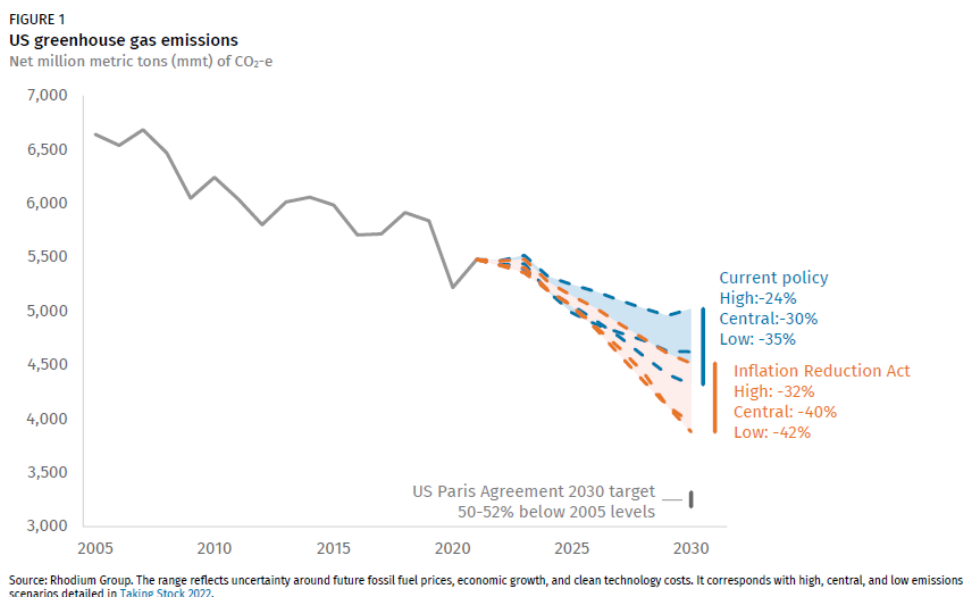
As mentioned in the introduction, climate financing comes from both private and public investors. Let’s turn our attention to the work the public sector is doing to close the climate financing gap.

Public financing sources receive a massive boost from the IRA.

The Inflation Reduction Act (IRA) of 2022 is the most significant climate legislation in U.S. history. The climate financing provisions baked into this bill are intended to accelerate the deployment of clean energy production and technologies, lower the country’s carbon emissions, upgrade our energy infrastructure, and provide significant incentives for private investors and consumers. Combined, the goal of these provisions is to reduce emissions in the U.S. by 40% by 2030. Some of the most impactful financing incentives include:

\$370 B	<i>Allocated to measures for improving energy security and accelerating clean energy transition</i>
\$60 B	<i>for clean energy manufacturing</i>
\$30 B	<i>for production tax credits to accelerate the domestic production of solar, wind, batteries, and critical minerals processing</i>
\$27 B	<i>allocated to a green bank called the Greenhouse Gas Reduction Fund which has the objective of deploying funding for clean energy across the country with specific green hydrogen tax credits</i>
\$20 B	<i>focused in cutting emissions from the agricultural sector with focused grants on improving soil and forestry protection</i>
\$10 B	<i>in tax credits to manufacturing facilities producing EVs</i>
✓	<i>Increased funding for carbon capture, utilization, and storage (CCUS) projects</i>
✓	<i>Increased tax on energy producers exceeding certain levels of methane emissions</i>

The significant investment and renewed focus on the climate crisis by agencies such as the EPA and Department of Agriculture, as well as local and state governments, is a critical first step in moving the country towards a low-carbon economy. As shown below, modelling completed by the Rhodium Group estimates that with the passing of the IRA, the U.S. emissions reductions jump from 24-35% by 2030 to 31-44% by 2030, which helps push the U.S. meaningfully closer to its Nationally Determined Commitment of 50-52% emissions reduction by 2030.⁷



Incentivizing private investment through tax credits.

The tax credit provisions of the IRA provide hundreds of billions in tax incentives, which will be critical in helping companies reduce emissions by investing in clean energy production, transportation, and manufacturing. **The Investment Tax Credit (ITC) and Production Tax Credit (PTC)** allow taxpayers to finance their investment in renewable energy systems by allowing them to deduct a percentage of the cost from their federal taxes. While the full list of tax credits available under the IRA is quite extensive, below are select tax credits we believe will be the most impactful in spurring additional financing towards climate technologies over the coming decade.

Tax Credit ⁸	What's Eligible?	Type
Nuclear Power Production Tax Credit (45U)	Nuclear power production from facilities in service in 2024 and earlier	PTC
New Hydrogen Production Tax Credit (45V)	Clean hydrogen production facilities or transformation of previously fossil fuel-based facilities	PTC
New Advantaged Manufacturing Production Tax Credit (45X)	Production of clean energy technology components produced in U.S. such as solar, wind turbines, offshore wind, inverters, battery components, and critical minerals.	ITC or PTC

Extension of Renewable Electricity Production Tax Credit (Section 45)	Extension of existing production tax through 2024 and replaced with 45Y in 2025. Applicable for geothermal, wind, biomass, landfill gas, solid waste, hydropower, marine/hydrokinetic	PTC
New Clean Energy Production Tax Credit (45Y)	Replaces Section 45 in 2025 and is an emissions-based incentive which is flexible across clean technologies. Technologies must produce electricity with zero or negative emissions (CCUS technologies may be used to achieve this).	PTC
Clean Fuel Production Tax Credit (45Z)	Creates a new technology neutral 2-year tax credit for low-carbon transportation fuel. Maximum credit is \$1 per gallon (or \$1.75 per gallon for sustainable aviation fuel) with an additional emission avoided multiplier.	PTC
Carbon Capture & Sequestration (CCS) Tax Credit (45Q)	Tax credit for CCS and Direct Air Capture (DAC) projects constructed before 2033 with specific dollar amounts per ton of CO2 based on type of technology and reduced minimum plant size thresholds from currently existing tax credit.	ITC
Extension of Energy Investment Tax Credit (Section 48)	Extends existing energy investment tax credit for construction of projects through 2024. Eligible projects include solar, geothermal, fuel cells, wind, waste energy, biogas, heat pumps, etc.	ITC
New Clean Electricity Investment Tax Credit (48E)	Replaces Section 48 in 2025 and is an emissions-based incentive which is flexible between clean energy technologies as mentioned above. The Treasury Department will be releasing emissions rates for similar technologies.	ITC

Finally, the IRA established procedures for parties to monetize ITC and PTC tax credits through **direct pay** and **transfer** provisions. The **direct pay** provision allows entities to receive a direct payment from the IRS for the full value of the tax credits claimed. The **transfer** provision allows taxpayers to transfer all or portions of certain tax credits to an unrelated party which allows firms to monetize these tax credits by selling them.

While this is groundbreaking progress toward increasing the amount of climate financing available to companies in the U.S. – it can be difficult for smaller or early-stage climate tech companies to access these incentives. Lack of access to capital or inability to access funding through traditional lending options can make it challenging for smaller-sized companies to access the benefits of these tax credits.

Fostering innovation through federal loan programs⁹

A lesser known but powerful tenant of the IRA is the appropriation of \$11.7 billion to the Loan Programs Office (LPO) to support the issuance of new loans for climate technologies. The IRA also increases the existing loan program authority by approximately \$100 billion and provides another \$5 billion to support the deployment of a new loan program – the Energy Infrastructure Reinvestment (EIR) Program. The IRA authorizes up to \$250 billion in new EIR loans. All together – the IRA allows the LPO to leverage \$16.7 billion of investment into \$350 billion in new loan authority – as outlined in the chart below.

Program	Status	Loan Authority	Scope
Title 17 - Section 1703: Innovative Clean Energy Loan Guarantee Program	Existing program, expanded	\$40B through 3Q2026	Clean energy technologies unable to obtain conventional financing due to high technology risks. These technologies include CCS, biomass, hydrogen, solar, wind, hydropower, grid delivery & reliability, alternative fuel, and industrial efficiency projects.
Advanced Technology Vehicles Manufacturing (ATVM) Direct Loan Program	Existing program, expanded	\$40B through 3Q2028	Production of: Light-duty vehicles which meet or exceed a 25% improvement in fuel efficiency versus a 2005 model and/or ultra-efficient vehicles which achieve a fuel efficiency of 75 MPG. Advanced engines & powertrains (including electrified powertrains and batteries), materials for light-weighting (such as aluminum, advanced steels, and composites), and associated hardware for EV charging and fuel cell hydrogen stations.
Tribal Energy Loan Guarantee Program (TELGP)	Existing program, expanded	\$20B through 3Q2028	Tribal investment in energy-related projects for federally recognized tribes.
Title 17 – Section 1706: Energy Infrastructure Reinvestment (EIR) Program	New Program	\$250B through 3Q2026	Projects that retool, repower, repurpose, or replace energy infrastructure that has ceased operations, or enable operating energy infrastructure to avoid, reduce, utilize, or sequester air pollutants or anthropogenic emissions of greenhouse gases.

This is a groundbreaking amount of money, which needs to be deployed quickly. The LPO has a mandate to deploy \$290 billion before 3Q 2026 and the rest before 3Q 2028. This represents an open call for innovation and large-scale investment.

The power of the IRA doesn't lie in these tax credits or loan programs alone – it lies in the ability to use public financing to spur private investment. For example, the IRA is expected to spur \$3 trillion in renewable energy technology investment by 2032 and another \$11 trillion in total infrastructure investments by 2050.

The IRA as a catalyst for global climate financing progress

While the IRA aims to accelerate domestic decarbonization, it has also been a catalyst for global policy evolution. The IRA established an example of how to take legislative action on climate change, and any country that wants to remain a key player in the century ahead will need to follow suit. While international reception of the IRA has been mixed, similar industrial policies have become increasingly popular among long-standing allies of the United States over the past 12+ months.

South Korea¹⁰

In September 2022, South Korea was one of the first countries to speak out against the IRA voicing concerns that the new U.S. consumer tax credits for electric vehicles (EVs) in the law discriminated against Korean companies. The main problem was the IRA's Section 30D requirement that to receive the consumer tax credit, the vehicle had to be assembled in North America. U.S. and Korean officials acknowledged problems facing Korean automakers and in December 2022, the Internal Revenue Service (IRS) clarified that leased vehicles would also be eligible for tax credits under the Section 45W of the IRA. This change made vehicles assembled in Korea—and elsewhere outside North America—eligible for tax credits. Domestically, South Korea has increased subsidies for Korean EV plants and is providing lending and other financial guarantees to help Korean battery companies make substantial investments to orient their supply chains outside of China – a requirement to access the U.S. tax credits in the IRA.

Japan¹¹

In December 2022, Tokyo unveiled its Green Transformation (GX) Basic Policy. The aim of the initiative is to drive economic growth and development by transforming the country from an economy, society, and industrial structure dependent on fossil fuels to “structures driven by clean energy”. The policy provides over \$1 trillion (USD equivalent) in public-private financing opportunities over the next ten years and targets areas including hydrogen, ammonia, carbon capture and electric vehicle adoption.

Europe^{12,13}

In March 2023, the European Union (EU) announced the Net Zero Industry Act (NZIA) and Critical Raw Materials Act (CRMA). These two pieces of legislation amend the regulatory framework for the clean-energy industry and the critical-minerals industry expediting the government-approval process for new factories, power facilities, mines and other plants. Under the NZIA, the bloc aims for its strategic net zero technologies manufacturing capacity to reach at least 40% of EU deployment needs by 2030. The bloc has adjusted its policies to allow its member states greater flexibility to incentivize private investors and match foreign subsidies, such as those available under the IRA.

Canada¹⁴

In April 2023, Canada announced an \$80bn investment plan aimed at promoting clean energy and sustainable infrastructure. The Clean Energy Investment Tax Credit represents more than \$25 billion through 2035 and is directed toward energy transition-focused investments. The budget also proposes a 15% refundable tax credit for investments in non-emitting electricity generation systems – such as wind, solar, hydro, and nuclear – as well as for “abated” natural gas-fired electricity generation subject to specific requirements.

UK^{15a, 15b}

Reaction to the IRA in the U.K. has been mixed. Jeremy Hunt, current Chancellor and member of the ruling Conservative party, announced that the country would not match subsidies to compete with the U.S. warning that Biden's regulation pushes a form of sovereign protectionism. Hunt has mentioned that future guidance on Britain's official response will be coming in the Fall of 2023. Senior members of government expect the response to involve reforms to the current “Contracts for Difference” scheme and would likely see more generous payments to private sector firms through a different “strike price” in contracts, while also considering reforms which would force more of the supply chain in green energy projects to be based in the U.K.

Conversely, Labor Party members largely dismiss the claim of the IRA being protectionist and believe strong legislation more in line with the IRA is critical for Britain to win investment, transition their economy, create jobs, and help the future be “Made in Britain”. Labor Party leader, Ed Miliband, has set forth details of his Party's full plan, named the Green Prosperity Plan, which includes a reiteration of the commitment

to end fossil fuels in the power system by 2030, net zero mandates for all key regulators, establishment of a new national wealth fund to invest in the private sector, and creation of GB Energy - a publicly owned clean energy company.

Opportunities are being created by these cross-border incentives.

No single government, law, or system of incentives can meet the climate change challenge – we must all work together. That said – there is one clear beneficiary of many of these enhanced regulations and incentives – companies.

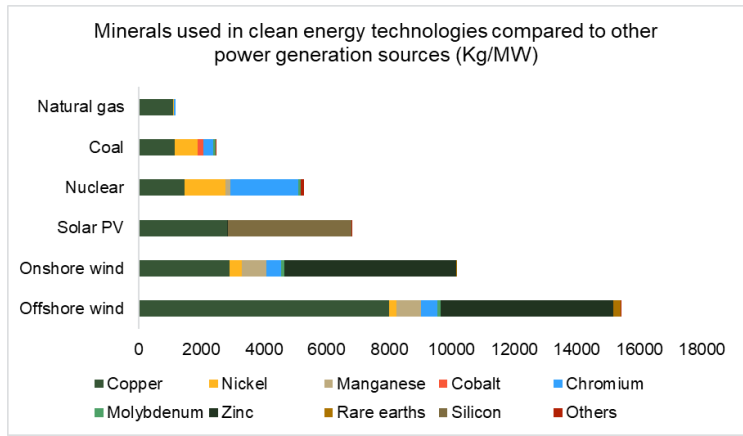
Companies can now tap into government incentives to enter new markets

The IRA may provide a compelling entry into U.S. markets for non-U.S. based companies seeking to expand their global footprint. Many of the IRA's investment tax credits can be utilized by international businesses seeking expansion into U.S. markets. Likewise, other non-U.S., IRA-like, programs may be favorable to U.S. companies seeking to expand internationally.

This supportive backdrop allows climate tech companies to potentially de-risk their global expansion by tapping into favorable policy-driven climate financing and loan incentives. This can be particularly attractive for climate technologies that require regional specificities. For example, certain mineralization focused carbon capture processes utilize basalt rock, an igneous rock found in the western United States. Another example is solar energy which operates at its highest efficiency when deployed close to the equator, at high elevation, and in dry climates, thereby making the Atacama Desert in Chile one of the best solar energy locations on the planet.¹⁶ Considering these important regional considerations, international partnerships which connect the scientific aspects of climate technologies with supportive policy will be essential for effective deployment and scaling. These partnerships not only further the transition goals of all nations but create efficient climate projects maximizing both real-world impact and financial gain.

Shifting to a clean energy system will increase demand for mineral resources

The energy sector is poised to become a major player in minerals markets¹⁸. In the U.S. alone – we expect the demand for mineral resources to increase by 400-600% over the next several decades. Lithium, nickel, cobalt, manganese, and graphite are crucial to battery performance, longevity, and energy density. Rare earth elements are essential for permanent magnets required for wind turbines and electric vehicle motors. Copper is the cornerstone for all our electricity related technologies and aluminum is needed across our energy networks.

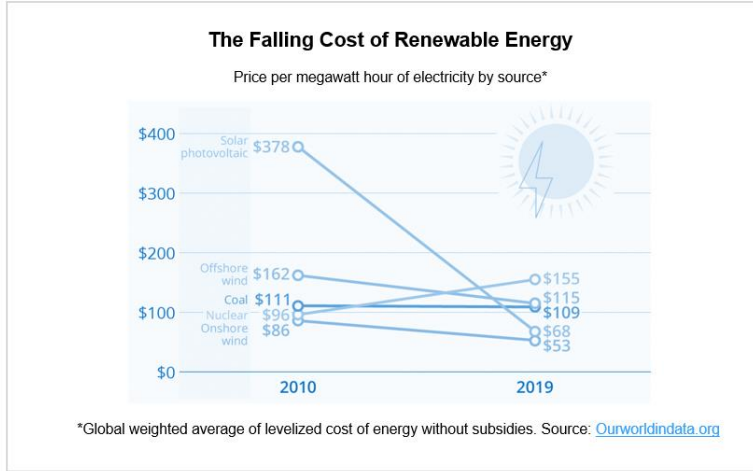


Many of these minerals are harvested and refined overseas in geopolitically unstable countries. To attract investment, emerging economies will need to embrace robust environmental, governance, and social standards that protect local communities – while also incentivizing companies to decarbonize their production processes. This shift also opens new opportunities for companies to enhance their contributions across the value chain – especially in the processing and manufacturing stages. Developing new and expanding existing partnerships within these regions is critical in the pathway to get to net zero.

Mature economies can accelerate the development of decarbonization technology for the world

The size and maturity of the U.S. and other developed economies provides companies with the ideal testing environment for decarbonization technology. By actively investing in clean energy generation, clean technology manufacturing, and other related industries, the U.S. and other developed nations can accelerate progress towards net zero and potentially position themselves as critical low-cost exporters of the tools needed to decarbonize. This may benefit other countries globally who may not be able to finance the massive investment needed to create innovative solutions.

One of the strongest levers we have to hasten the adoption of clean energy is to improve the cost curve. Once clean energy reaches cost parity with fossil fuels, transitioning to renewable energy becomes a no-brainer. In the United States, the IRA acts as an accelerant for improving climate tech economics by providing incentives for companies to invest, something they may have put off doing without regulatory, tax, and/or financial incentives in place.



As clean energy achieves economies of scale in certain industries, it can be exported globally as a low-cost alternative to fossil fuels. Many emerging economies may not have the resources or financing available to invest in expensive long-term transition projects. Offering a low-cost alternative to import allows these economies to invest where immediately necessary without having to choose between critical needs and sustainable growth.

Closing the gap

To meet our net zero goals, we must reduce and remove as much carbon dioxide-equivalent (CO₂e) emissions from the atmosphere as possible and adapt our way of life to thrive in a low-carbon future. Climate financing – from both the public and private sector - is key to reaching these goals.

Public finance is needed to jump-start the investment engine and significant private investment in low-carbon technology and infrastructure will be needed to keep it running. Governments across the globe must continue to support the private sector with long-term incentives to invest in low-carbon infrastructure and technologies. And private investors must continue to remove barriers to entry to accelerate the speed and scale of capital deployment.

These types of innovative partnerships will not only help us close the climate financing gap – but also build a thriving world for future generations.

EndNotes

¹ "Introduction to Climate Finance." United Nations Climate Change. 2023. <https://unfccc.int/topics/introduction-to-climate-finance>

² "Financing Roadmaps." www.gfanzero.com, www.gfanzero.com/netzerofinancing/.

³ "What Is the Inevitable Policy Response?" PRI, www.unpri.org/inevitable-policy-response/what-is-the-inevitable-policy-response/4787.article.

⁴ Climate Finance Funding Flows and Opportunities What Gets Measured Gets Financed. 2022.

⁵ Buchner, Barbara, et al. Global Landscape of Climate Finance 2021 AUTHORS. 2021.

⁶ Gabbatiss, Josh. "Analysis: Why Climate-Finance "Flows" Are Falling Short of \$100bn Pledge." Carbon Brief, 25 Oct. 2021, www.carbonbrief.org/analysis-why-climate-finance-flows-are-falling-short-of-100bn-pledge/.

⁷ "A Turning Point for US Climate Progress: Assessing the Climate and Clean Energy Provisions in the Inflation Reduction Act." Rhodium Group, rhg.com/research/climate-clean-energy-inflation-reduction-act/.

⁸ "Inflation Reduction Act Tax Credit Opportunities for Hydropower and Marine Energy." Energy.gov, <https://www.energy.gov/eere/water/inflation-reduction-act-tax-credit-opportunities-hydropower-and-marine-energy>

⁹ "Inflation Reduction Act of 2022." Energy.gov, www.energy.gov/lpo/inflation-reduction-act-2022.

¹⁰ Bown, Chad P. "How the United States Solved South Korea's Problems with Electric Vehicle Subsidies under the Inflation Reduction Act." SSRN Electronic Journal, 2023, www.piie.com/sites/default/files/2023-07/wp23-6.pdf

¹¹ InfluenceMap. "Japan's GX (Green Transformation) Policy: Less Green than It Appears." influencemap.org, influencemap.org/report/GX-policy-20854.

¹² "Renewable Energy Targets." Energy.ec.europa.eu, energy.ec.europa.eu/topics/renewable-energy/renewable-energy-directive-targets-and-rules/renewable-energy-targets_en.

¹³ Chee, Foo Yun, and Foo Yun Chee. "EU Companies Can Get as Much in EU Aid as US Subsidies under Looser Rules." Reuters, 9 Mar. 2023, www.reuters.com/markets/europe/eu-companies-can-get-much-eu-aid-us-subsidies-under-looser-rules-2023-03-09/.

¹⁴ Ghantous, Nour. "Canada's Inflation Reduction Act Response: An \$80bn Clean Energy Plan." Energy Monitor, 7 Apr. 2023, www.energymonitor.ai/policy/canadas-ira-response-an-80bn-clean-energy-plan.

^{15a} "No Thanks, Joe: Britain Won't Copy Biden's IRA Spending Splurge." POLITICO, 16 Aug. 2023, www.politico.eu/article/uk-jeremy-hunt-response-to-joe-biden-ira-us-protectionism/.

^{15b} Neame, Katie. "Labour Would Oversee British Version of Inflation Reduction Act, Miliband to Say." LabourList | Latest UK Labour Party News, Analysis and Comment, 27 Mar. 2023, labourlist.org/2023/03/labour-would-oversee-british-version-of-inflation-reduction-act-miliband-to-say/.

¹⁶ "WNN | Where Is the Best Location on Earth for Solar Energy?" Www.whatnextnow.com, <https://www.whatnextnow.com/home/solar/where-is-the-best-location-on-earth-for-solar-energy>.

¹⁷ The White House. "FACT SHEET: Securing a Made in America Supply Chain for Critical Minerals." The White House, 22 Feb. 2022, www.whitehouse.gov/briefing-room/statements-releases/2022/02/22/fact-sheet-securing-a-made-in-america-supply-chain-for-critical-minerals/.

¹⁸ International Energy Agency. "Executive Summary – the Role of Critical Minerals in Clean Energy Transitions – Analysis." IEA, 2021, www.iea.org/reports/the-role-of-critical-minerals-in-clean-energy-transitions/executive-summary.

¹⁹ ADAPT NOW: A GLOBAL CALL for LEADERSHIP on CLIMATE RESILIENCE #AdaptOurWorld.

About Earth Finance

Earth Finance works with organizations, policymakers, and investors to accelerate their transition to a low-carbon economy. We combine corporate strategy - including market, policy and climate tech impact assessments; climate transition planning; new business model creation; and project deployment – with creative financing and capital, which we invest in solutions that can accelerate progress toward a net zero future. Our interdisciplinary team of experienced business strategists, scientists, policy makers, and investors collaboratively build solutions which help organizations and investors thrive in a low-carbon economy.

Learn more about us at www.earthfinance.com

About the Authors

Jennifer Sullo is Managing Director of Asset Management and Investment Solutions at Earth Finance. She brings significant experience developing custom sustainable investment portfolios and structuring innovative climate investment solutions. Prior to Earth Finance, Jen was Global Head of Sustainable Investing Solutions at Goldman Sachs Asset Management (\$2.2T) where she was responsible for global sustainable investing strategy, product development, and partnerships. Prior to Goldman Sachs, Jen held various positions at J.P. Morgan Corporate & Investment Bank, Voya Investment Management and GE Asset Management. Jen holds a B.S. Economics – Trinity College and an M.S. Finance – Fairfield University.

Josh Shrair is a Climate Investment Specialist at Earth Finance. He brings specific expertise integrating sustainability into multi-asset portfolios and due diligence. Previously, Josh was an Associate at Goldman Sachs Asset Management. Josh holds a B.S. in Finance from Syracuse University.

Important information

Nothing contained in this material is intended to constitute legal, tax, securities, or investment advice, nor an opinion regarding the appropriateness of any investment, nor a solicitation of any type. The general information contained in this presentation should not be acted upon without obtaining specific legal, tax, and investment advice from a licensed professional.

Past performance is not indicative of future results.

© **Earth Finance, Inc. 2023**. All rights reserved. This material is proprietary and may not be reproduced, transferred, or distributed in any form without written permission from Earth Finance. It is delivered on an "as is" basis without warranty.