

Financing the Low-Carbon Future

A Private-Sector View on
Mobilizing Climate Finance



CLIMATE
FINANCE
LEADERSHIP
INITIATIVE

In late 2018, United Nations Secretary-General António Guterres asked Michael R. Bloomberg, UN Special Envoy for Climate Action, to lead a private-sector initiative to “support a global mobilization of private finance in response to the challenge of climate change.”

Senior executives of seven major private-sector institutions — Allianz Global Investors, AXA, Enel, Goldman Sachs, HSBC, Japan’s Government Pension Investment Fund (GPIF), and Macquarie — joined Bloomberg as chair in creating the Climate Finance Leadership Initiative (CFLI).

These leading institutions represent diverse roles across the investment value chain, including an international utility, banks, insurers, asset managers, and asset owners.



The CFLI shares its expertise in financial markets in *Financing the Low-Carbon Future*, a report on mobilizing private climate finance at the scale and speed needed to support an orderly transition to a low-carbon economy.

The report — summarized in this booklet — outlines the primary challenges and solutions to increasing private-sector investment in low-carbon opportunities. In doing so, it highlights key roles within the public and private sectors for mobilizing the global financial system to support the transition to a low-carbon future.

The report is available in full at [bloomberg.com/cfli](https://www.bloomberg.com/cfli)





We are pleased to present the Climate Finance Leadership Initiative report in support of building a sustainable low-carbon economy. In accordance with the objectives of the initiative, this report outlines solutions for further mobilizing private-sector capital in line with the goals of the Paris Agreement.

The need for climate action has never been more urgent, and finance can play a powerful role in the transition to a sustainable and inclusive global economy. To achieve this transition, the world requires a significant shift in investments that make financial flows consistent with pathways toward low greenhouse gas emissions and climate-resilient development. Meeting this goal will depend on the public and private sectors coming together to support an inclusive and orderly transition from high- to low-carbon assets on a global scale — and quickly.

Although each member of this initiative brings a different expert perspective from across the investment chain, we have all seen that progress is not only possible but also presents significant opportunities for our businesses and the clients and communities that we serve. This report highlights real-world examples of best practices and actionable solutions to the challenges that most often hinder sustainable low-carbon investment. Today, we have the knowledge, the capability, and the insight to further scale new investment in clean energy and other green opportunities and to support the transition of existing investments in reducing their emissions.

While we are committed to action, our organizations cannot drive the necessary change alone. We call on our peers, as well as industry, public finance, and policymakers, to join together in harnessing the power of financial markets and driving investment solutions to urgently address climate change. We must further catalyze efforts and work together to ensure sustainable and inclusive growth for our global economy.

CFLI Members

Bloomberg

Allianz 
Global Investors



enel

**Goldman
Sachs**



 **HSBC**

 **MACQUARIE**

Key Challenges and Solutions for Financing a Low-Carbon Future

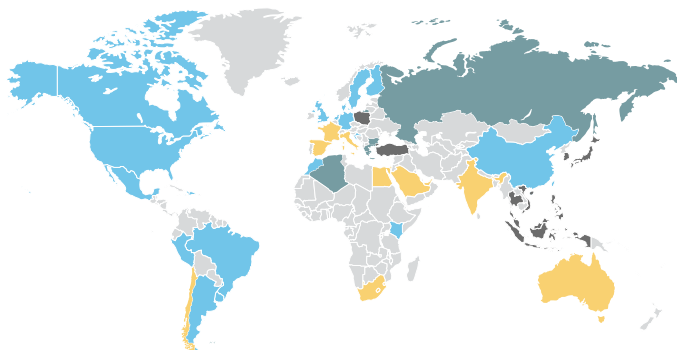


Facts and Figures: Financing a Low-Carbon Economy

Driven by the growing cost-competitiveness of clean energy across the globe, total annual clean energy investment rapidly increased to

\$354B

in 2018, from \$60B in 2004.ⁱ
And renewables are now the
cheapest source of energy
generation in many countries.



Cheapest source of energy generation by country in 2019ⁱⁱ

- Coal
- CCGT
- PV
- Onshore wind
- Not identified

However, a significant gap remains...

The Intergovernmental Panel on Climate Change estimates that a



increase in low-carbon investment is needed from 2015 levels to limit warming to 1.5°C.ⁱⁱⁱ

Clean energy investments helped avoid

214Mt



of CO₂ emissions in 2018.

But economic growth led to

1.25Gt

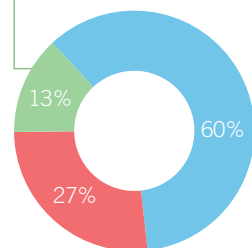


of new energy sector CO₂ emissions, a net increase from 2017.^{iv}

...and rapidly growing emerging markets have only attracted a small share of clean energy investment.

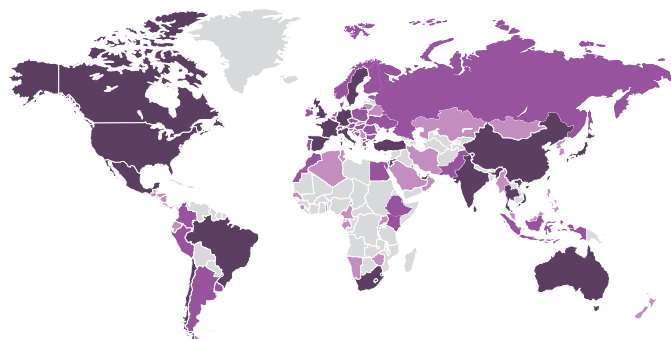
Share of investment 2008-2018^v

0.1% Share of investment for the 31 lowest-income countries



■ High-income ■ China ■ Other emerging markets

Private-sector investment in clean power projects



■ <\$100M ■ \$1B to \$9.9B ■ \$100M to \$999M ■ \$10B and more

ⁱ BloombergNEF (BNEF), Global Clean Energy Investment database.

ⁱⁱ BNEF, "New Energy Outlook 2019," June 2019.

ⁱⁱⁱ IPCC, "Special Report: Global warming of 1.5°C," Geneva, 2018.

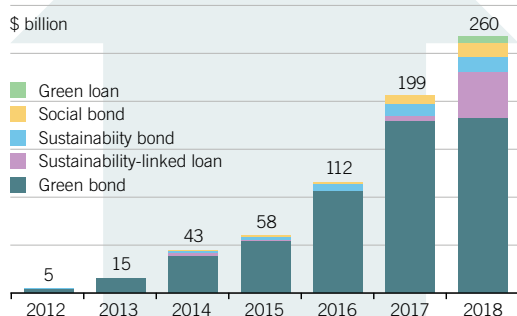
^{iv} International Energy Agency (IEA), "Global Energy & CO₂ Status Report 2018," March 2019.

^v BNEF, Global Clean Energy Investment database.

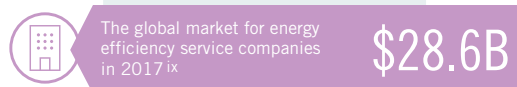
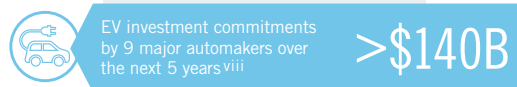
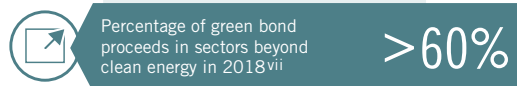
Facts and Figures: Financing a Low-Carbon Economy *continued*

Low-carbon investment needs to increase across all sectors...

Dominated by green bonds, issuance of sustainable debt finance has grown dramatically to \$260B in 2018.^{vi}



There is also progress in sectors beyond power...



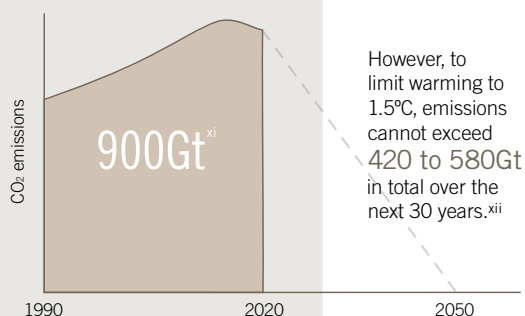
but the percentage of green bond proceeds in emerging markets for **industry** and **land use** was only



respectively, in 2018 and even in smaller developed markets.^x

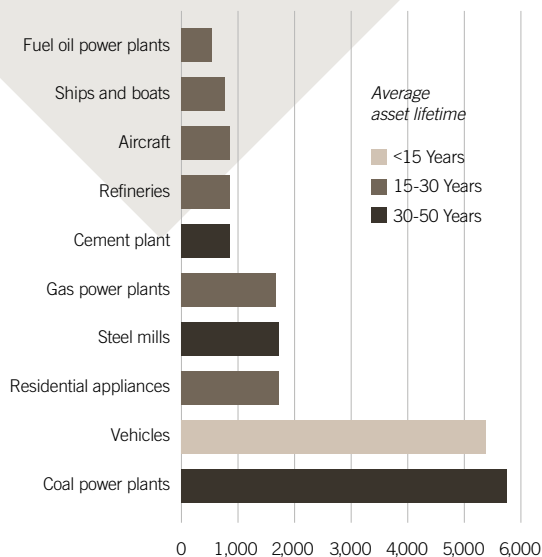
...and significant work is needed to transition existing sectors.

In the past 30 years, CO₂ emissions totaled over:



Most emissions come from long-lived infrastructure, which can lock in emissions well into the future.

Global annual emissions by asset type, 2016 (MCO₂)^{xiii}



^{vi} BNEF, Sustainable Debt database.

^{vii} Climate Bonds Initiative, "Green Bonds: The State of the Market 2018," 2018.

^{viii} BNEF, Marklines, company press releases.

^{ix} IEA, Energy Service Companies.

^x Climate Bonds Initiative, "Green Bonds: the State of the Market 2018," 2019; and "2018 Green Bond Market Summary," Jan 2019.

^{xi} CDIAC, "Global, regional, and national fossil-fuel CO₂ emissions," & "Carbon emissions from land use and land-cover change." Accessed June 2019.

^{xii} IPCC, "Special Report: Global warming of 1.5°C," Geneva, 2018.

^{xiii} IEA, CO₂ emissions from fuel combustion database; IPCC, "AR5 Synthesis Report: Climate Change 2014," Geneva, 2014.

Opportunities for Financing the Low-Carbon Future

The financial sector has the opportunity to play a significant role in the success of the transition to a low-carbon economy. However, annual investment in clean energy and energy efficiency is not yet on a path to meet the sixfold increase needed to limit global warming to 1.5°C by 2050, as estimated by the Intergovernmental Panel on Climate Change.¹ Although there is high demand from the private sector for low-carbon investment opportunities, several challenges stand in the way of further mobilizing climate finance.

The CFLI report, *Financing the Low-Carbon Future*, explores these challenges as well as key solutions — spanning the private sector, public finance, and public policy — that can help overcome them. Informed by the expert members of the CFLI, *Financing the Low-Carbon Future* offers insights into how to further mobilize private climate finance at the scale and speed needed to support a rapid and orderly transition to a low-carbon global economy.

A Private-Sector Perspective

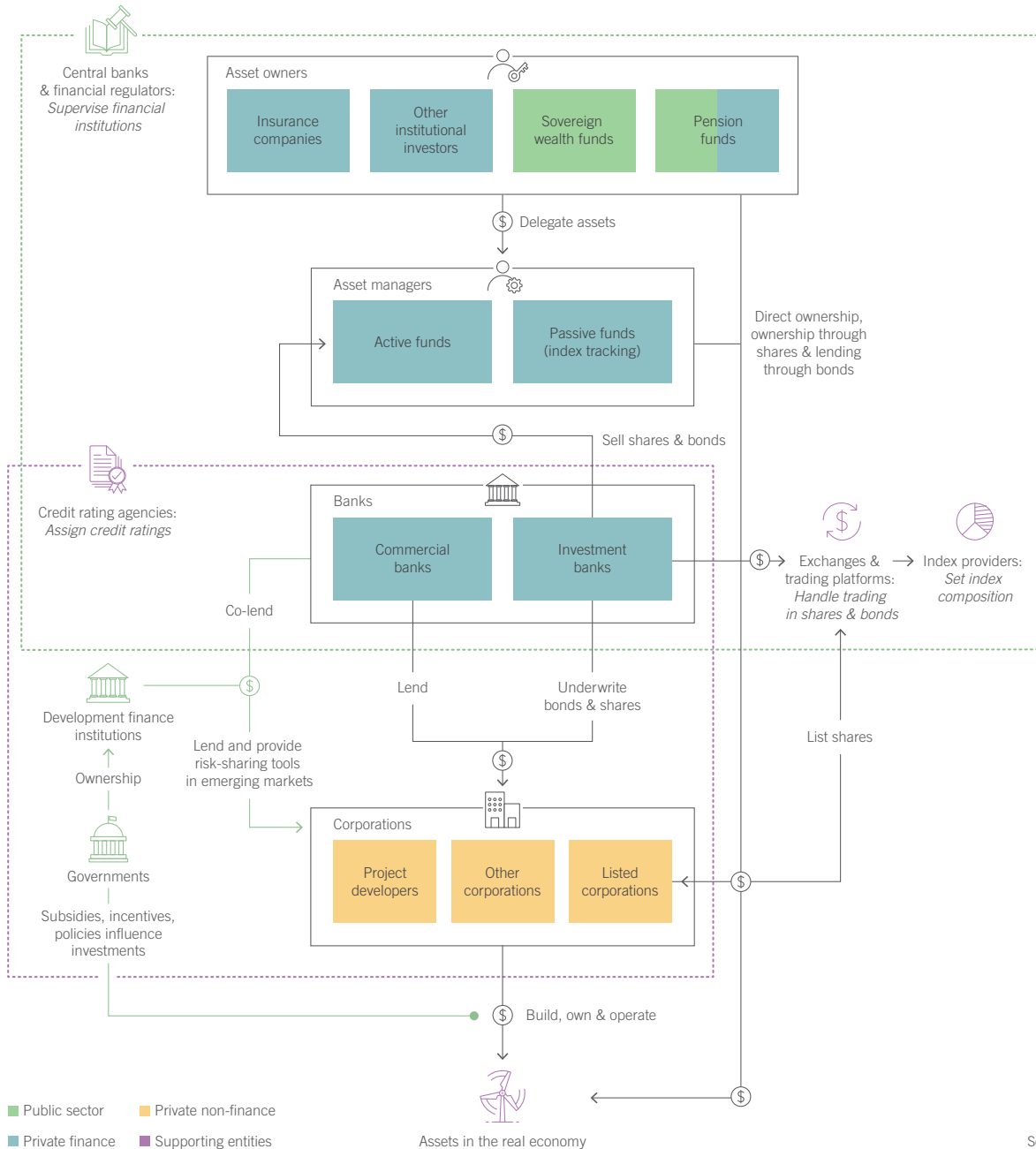
Private-sector capital flows to **opportunities with an attractive risk-adjusted return**. Certain low-carbon investments can provide such a return today, while others in certain geographies or technologies **depend on further progress and collaboration with the public sector**.

Although increasing financial flows to new low-carbon alternatives is an important element of the transition, it is only part of the answer. **Reducing emissions will require a holistic approach** that also supports the transition of existing carbon-intensive sectors.

The investment value chain is comprised of a diverse range of institutions, each playing an important role. Policymakers and public-sector actors can have a significant influence on the investment chain, for example, by **creating the enabling conditions and policy frameworks** that impact investment risk and returns.

¹ Intergovernmental Panel on Climate Change, "Special Report: Global Warming of 1.5°C," Geneva, 2018.

The Investment Chain: The interaction of the private sector, public sector, and real economy



“Private finance” is a complex chain of firms with differentiated roles, including asset development, lending, insurance, asset management, and many others. The successful mobilization of climate finance requires a broad partnership among private financial institutions, policymakers, regulators, and public-finance institutions.²

² The investment chain figure above is highly simplified and focuses on major roles across the investment chain. Individual financial institutions may serve in multiple roles. In line with the scope of the report, this figure does not include financing that may be needed for early-stage solutions.

Challenges and Solutions to Mobilize Private Finance

The challenges identified by the CFLI align with two key pillars for financing an effective low-carbon transition: increasing low-carbon investment (Challenges 1, 2, and 3) and supporting the transition of carbon-intensive sectors (Challenge 4). Challenge 5 relates to both elements and focuses on systematic challenges facing the financial sector.

The solutions presented for each challenge address the critical roles of private finance, public finance, and policymakers — working in concert — in overcoming each of these challenges.

In addition, the report focuses on measures that can accelerate the transition to a low-carbon economy in the near to medium term across the power, transport, industry, buildings, and land-use sectors, as well as demand-side actions to drive emissions reductions, such as the more efficient use of energy or demand from customers for more sustainable products.

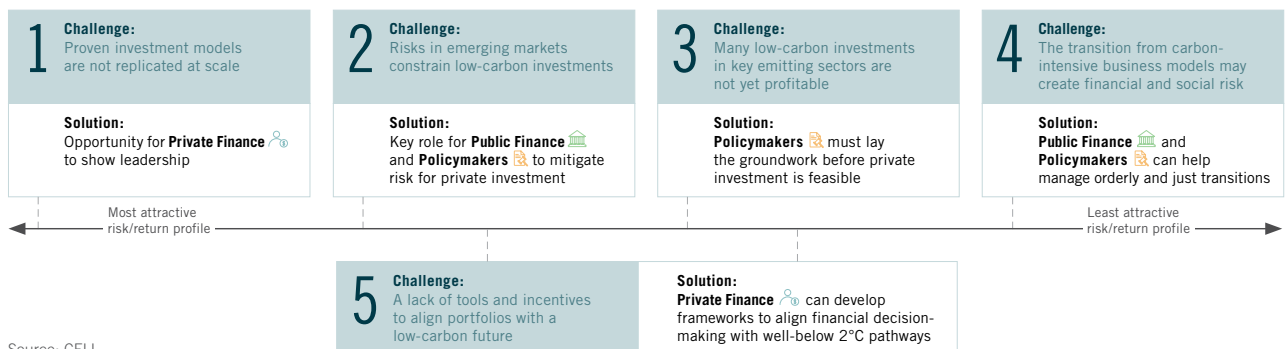
Case Studies

The full version of *Financing the Low-Carbon Future* includes case studies on successful low-carbon investments in various sectors and geographies. These case studies highlight real-world actions aligned with each solution identified in the report and demonstrate that action is not only possible but often already under way. Download the full report: [bloomberg.com/cfli](https://www.bloomberg.com/cfli)

Together, these measures could help to substantially reduce global emissions over the next 10 to 15 years.

Although not intended to be comprehensive, the solutions in *Financing the Low-Carbon Future* highlight actionable, near-term opportunities to support the scale and acceleration needed to help limit global warming to well-below 2°C.

Challenges and solutions to mobilize private finance in support of the low-carbon transition



Source: CFLI.

1 Challenge: Proven investment models are not replicated at scale

Despite progress in clean energy investment, investor appetite for clean energy projects often exceeds the volume of investment opportunities. Renewable energy capacity additions have stagnated in some mature markets with a track record of solar and wind deployment. In part, this stagnation is due to policy reversals or uncertainty, which have undermined the stable revenue models that support clean energy investment. Development of new coal-fired power plants continues even in markets where low-carbon alternatives are already cheaper, particularly in emerging markets with rapidly growing power demand.^{3,4}



Image: Antonio Garcia via Unsplash.com

³ Global Energy Monitor, "Global Coal Plant Tracker," July 2019.

⁴ BloombergNEF, Prices, Tariffs & Auctions database: LCOE data.

Key Solutions to Challenge 1

Private Finance

Where the enabling regulatory frameworks exist, large electricity consumers can enter into power purchase agreements (PPAs) with project developers and utilities, especially where clean energy can deliver electricity at a lower cost than the power procured from the grid. Depending on regulation, the electricity can be generated on site, delivered via the grid, or procured through a virtual PPA.

The securitization of clean energy project debt in bonds can also allow developers to access capital markets for long-tenor, fixed-rate financing and expand funding opportunities beyond the use of non-recourse loans. Given investors' strong appetite for low-carbon investment opportunities, these financial products can continue to be scaled.

Public Finance

Public budgets can continue to play a central role in clean energy deployment by guaranteeing revenues, especially in new markets and for newer technologies. Revenue security plays a decisive role in making clean technologies more attractive than carbon-intensive alternatives and providing investors with the confidence to deploy capital over longer periods.

Public Policy

Governments can set ambitious long-term targets for decarbonizing the energy sector, supported by short- to medium-term procurement goals for clean energy and stable enabling investment frameworks. Governments can also review permitting and litigation rules to help minimize project delivery times and avoid cancellations.

2 Challenge: Risks in emerging markets constrain low-carbon investments

The recent rise of clean energy investment — both public and private — is highly concentrated in high-income countries, China, and a small group of fast-growing economies.⁵ Despite rapidly increasing energy demand, other emerging markets have struggled to attract capital for clean energy projects — even in cases where wind and solar may be more competitive than fossil fuels. This lack of investment is due to several factors, including country- and project-specific risks, a lack of policies and regulations to support clean energy markets, underdeveloped local capital markets, and the absence of experienced project developers and value chains. Such factors can deter investment or significantly raise risks for investors compared with advanced markets. The resulting increase in the cost of capital disproportionately impacts capital-intensive investments such as renewable energy projects.



⁵ BloombergNEF, Prices, Global Clean Energy Investment database.

Key Solutions to Challenge 2

Private Finance

In addition to providing asset financing where enabling conditions permit, international equity and debt providers can also invest in local developers or other companies along the value chain. Investing in developers, rather than projects, can also offer higher returns and earlier-stage access to growth markets. Private-sector organizations can also communicate clear guidelines for factors that make projects more appealing to investors, such as the CFLI's investment-readiness guidelines described in the report.

Public Finance

Development finance institutions (DFIs) can be critical for opening new markets and sectors to private investment by establishing a track record for investment, facilitating the regulatory change needed for commercial investment, and supporting project pipeline development through project preparation facilities. In more mature markets and sectors, DFIs can unlock more capital by partnering with banks and asset managers to co-finance projects and by developing fixed income and structured finance products for other institutional investors. In instances where commercial opportunities do not exist, DFIs can leverage private investment through risk-sharing tools, such as guarantees and political risk insurance, and their ability to source and coordinate catalytic finance from donors and third parties.

Public Policy

Domestic policymakers can stimulate private finance flows by enhancing the general enabling environment for low-carbon investment. Clear, clean energy targets, regulatory frameworks that allow privately developed clean energy projects access to the electricity grid, and at least one major policy that directly incentivizes investment, such as clean energy auctions or feed-in tariffs, are typically needed to mobilize private investment. Domestic policymakers can also take steps to improve the general investment climate, including establishing predictable and fair dispute resolution frameworks. Policy stability is also critical. Reversals or renegotiations of PPAs, tax incentives, or other agreements — particularly in the early stages of market development — can have a long-lasting negative impact on future investor interest.

3 Challenge: Many low-carbon investments in key emitting sectors are not yet profitable

In contrast to the growing cost-competitiveness of renewable energy generation and electric vehicles, fewer viable alternatives exist in many sectors with a significant share of global emissions. These sectors include heavy industry (18% of emissions), heavy-duty transportation (13% of emissions), and agriculture, forestry and land use (24% of emissions).^{6,7} In some cases, solutions for decarbonizing these sectors are technically viable but not yet economical due to high capital costs and lack of incentives or revenue models. In other cases, the necessary technology solutions require more development to reach commercialization.



⁶ IPCC, "AR5 Synthesis Report: Climate Change 2014," Geneva, 2014.

⁷ Energy Transitions Commission, "Mission Possible: Reaching Net-Zero Carbon Emissions from Harder-to-Abate Sectors by Mid-Century," 2018.

Key Solutions to Challenge 3

Private Finance

Corporations that produce steel, cement, aluminum, and other commodities can develop labeling standards for low-carbon products, helping to lay the foundation for greater demand for these goods. Through their purchasing power, corporations and end-consumers can drive demand for low-carbon materials or products, creating an incentive for suppliers to invest in emissions reduction measures.

Public Finance

Public funding can provide revenues for low-carbon investments — for example, through market-based subsidy mechanisms or other results-based finance schemes. Incentives leveraging public finance are especially attractive in markets and sectors where the introduction of fully fledged carbon markets is not yet viable or when carbon market prices are too volatile to support long-term investment.

Public Policy

The broad application of stable, long-range carbon pricing across major economies could level the playing field for trade-exposed, high-carbon industries such as steel and cement and spur more long-term investment in alternative industrial production processes. Phasing out policies like fossil fuel subsidies would also contribute to making investment in clean energy and efficiency measures more attractive. In addition, public procurement, incentive schemes, and product standards can support the development of markets for low-carbon products.

4 Challenge: The transition away from carbon-intensive business models may create financial and social risk

Many assets in the real economy are long-lived, ranging from around 15 years for cars and buses to up to 50 years for fossil fuel power plants and 100 years or more for buildings. As a result, the financing decisions of the past can lock in carbon emissions well into the future. “Committed” emissions from existing fossil fuel-based assets in the power, industrial, and transport sectors are already incompatible with a 1.5°C trajectory.⁸ Consequently, some carbon-intensive assets will likely need to be retired early, requiring a transformation of the corporations, utilities, and communities that have historically relied on their operation.



⁸ D. Tong et al., “Committed emissions from existing energy infrastructure jeopardize 1.5°C climate target,” *Nature*, 2019. This study assumes that assets would operate according to historical average lifetimes.

Key Solutions to Challenge 4

Private Finance

Investors and lenders can develop a wider range of financial products to support corporations that have adopted ambitious transition goals, such as transition bonds or corporate bonds linked to longer-term transition strategies. Supporting corporations in their transition can create a virtuous cycle: More money invested in clean companies can create a greater appetite for the transition — lowering financing costs and ultimately leading to more investment.

Corporations and investors can also support the just transition of communities and workers by incorporating social criteria into their investment decisions, investing in retraining programs, and recognizing the long-term value of inclusive growth.

Public Finance

Public budgets can provide direct support to communities, households, and workers affected by the transition. This support can include measures to mitigate short-term impacts, such as providing compensation, workforce development programs, and community grants to diversify local economies, while also investing in longer-term industrial transition strategies that may not generate the level of financial returns needed to attract private investment.

Public Policy

Government policy can encourage owners and operators of carbon-intensive assets to make the transition to low-carbon alternatives. For example, regulation can determine the schedule of closure of carbon-intensive assets or introduce emissions standards that increase in stringency over time. Such measures offer a path for investors to anticipate change and plan the decommissioning of carbon-intensive assets to avoid uncertainty for owners and operators as facilities are retired.

5 Challenge: A lack of tools and incentives to align financial portfolios with a low-carbon future

Achieving net-zero emissions by mid-century will also require the financial sector to more systematically account for material climate-related information in financial decision-making. However, there is currently a lack of decision-useful information and methodologies that facilitate the integration of climate-related risks and opportunities into investment decisions. In addition, there are practical challenges, including the quantity of suitable low-carbon investments across asset classes.



Key Solutions to Challenge 5

Private Finance

Organizations across the investment chain can work to incorporate climate-related risks and opportunities into governance, strategies, and financial decision-making. As part of this effort, financial-sector leaders can emphasize the importance of climate-related financial disclosure to inform their decision-making, such as reporting in line with the recommendations of the Task Force on Climate-related Financial Disclosures. In addition, investors and lenders can work to align financial flows more systematically with well-below 2°C pathways, including by partnering with corporations through investing and financing to help achieve climate-related targets, transition strategies, and industry-specific transition pathways.

Credit rating agencies can routinely, consistently, and transparently integrate climate-related risks and opportunities into credit assessments. Including climate risk and transition analysis in mainstream rating criteria could steer private-sector capital to corporations that are best positioned in the transition to a low-carbon economy.

Public Finance

The sovereign shareholders of public and multilateral financial institutions — notably development banks, sovereign wealth funds, and government pension funds — can lead by example by ensuring these institutions move to align portfolios with well-below 2°C pathways. Multilateral development banks and DFIs are already aligning their decision-making with the Paris Agreement, and a growing number of sovereign wealth funds and government pension funds plan to integrate climate-related factors into their portfolio management activities.

Public Policy

Central banks and financial regulators can continue to promote understanding of climate-related risks and their potential financial implications. For example, they can assess the exposure of their domestic financial systems to climate-related risks, conduct stress tests, and encourage climate-related financial disclosure.

Policymakers can also develop standards and taxonomies to bring greater transparency regarding which activities are aligned with the low-carbon transition. For example, the EU Technical Expert Group on Sustainable Finance has proposed a taxonomy to define which activities are considered environmentally sustainable and plans to update this taxonomy regularly to reflect the evolution of the market and technologies.

An aerial photograph of a vast solar farm at sunset. The solar panels are arranged in neat rows, reflecting the golden light of the setting sun. In the background, there are power lines and a hazy horizon. A semi-transparent dark blue box contains a quote and attribution.

Partnership to Catalyze Climate Finance in Emerging Markets

“Meeting big challenges requires governments and business to work together, especially at a time when tensions and temperatures are both rising around the world.”

Michael R. Bloomberg, Founder, Bloomberg L.P.,
July 2019

EDFI-CFLI Partnership

Global financial institutions are well-positioned and already taking action to further mobilize climate finance in the transition to a low-carbon economy. However, as outlined in *Financing the Low-Carbon Future*, there are still certain challenges that will only be overcome through innovative partnerships across the public and private sectors.

Many emerging markets, for example, have seen little investment in clean energy projects. This lack of investment may be due to several factors, including country- and project-specific risks, a lack of policies and regulations to support clean energy markets, underdeveloped local capital markets, and the absence of experienced project developers and value chains. However, there is increasing demand for energy, products, and services in emerging markets and investment in low-carbon solutions can drive financial opportunities for economic growth while mitigating climate risk.

In response to these challenges and significant potential financial opportunities, CFLI is partnering with the Association of European Development Finance Institutions (EDFI) to catalyze climate finance in emerging markets and advance the public-private collaboration vital to closing the climate finance gap.

The EDFI and CFLI partnership will facilitate collaboration to:

Originate, structure, and co-finance low-carbon opportunities on a deal-by-deal basis or through pooled investment vehicles;

Explore development of structured finance and portfolio investment solutions to meet the needs of institutional investors and increase the availability of efficient financing for developers;

Identify and deploy incremental risk mitigation tools, such as first loss cover available from concessional capital providers; and

Support policy engagement efforts on enabling environments to attract private sector capital and use joint projects wherever possible to help highlight sound policy standards.

Through 2025, CFLI financial institutions collectively are already prepared to facilitate the deployment of over \$20 billion in emerging market climate financing and investment to help realize opportunity in the low-carbon transition. The EDFI-CFLI partnership is one more step to develop new project pipelines and enhance bankability of investment opportunities in emerging markets.

Through this partnership, EDFI and CFLI will facilitate meaningful engagement by their members — including some of the world’s leading bilateral development finance institutions, project developers, banks, insurers, asset managers, and asset owners — to build project pipelines, manage risks, and broaden opportunities for private-sector investment in emerging market climate finance.

Development finance institutions have acquired significant experience in successfully investing on market-based terms in developing countries, opening markets, and paving the way for private-sector capital. They help mitigate risk for private sector investments — including through providing deep market experience, established reputation, preferred creditor status, and risk-mitigating tools such as political risk insurance. The partnership will also support EDFI in achieving its goals of continuously increasing the mobilization of private-sector capital for low-carbon investments in emerging markets.

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Underpinning this partnership is a new set of CFLI-developed Investment Readiness Guidelines that draw on the experience of lenders and investors in emerging markets. The Guidelines identify fundamental factors that many institutions consider in low-carbon investment and finance in emerging markets, with a particular focus on investments in renewable energy generation and transmission. EDFI and CFLI will use the Guidelines as a reference document in dialogue with outside stakeholders, such as governments and concessional capital providers, on targeted issues that advance sound policy standards.

EDFI and CFLI share the belief that progress toward global climate goals can be accelerated by combining and coordinating the financial resources, instruments, and risk appetites of publicly-backed development finance institutions and private sector firms across the investment value chain. This partnership demonstrates the commitment to jointly increasing capital flows to emerging markets in support of the goals of the Paris Agreement and Nationally Determined Contributions (NDCs).

The Road Ahead

The scale and diversity of the climate challenge are so great that no single solution will be sufficient. CFLI member institutions are already taking action across their businesses to test and scale products, services, and investment approaches to help address the challenges outlined in *Financing the Low-Carbon Future*.

Some of the most critical solutions must be implemented through broad partnerships across the financial system.



This is why CFLI members, through partnerships across the private and public sectors, are implementing actions that help drive progress toward a low-carbon future.

Additional information on CFLI member actions is available at [bloomberg.com/cfli](https://www.bloomberg.com/cfli)

We gratefully acknowledge the contributions of BloombergNEF, a leading provider of research on energy and sustainability, and Rocky Mountain Institute, a global nonprofit organization that accelerates the energy transition from fossil fuels to efficiency and renewables using market-based solutions, to the development of the CFLI report.