Ceres

Sustainable Finance Opportunities

A Guide for Financial Institutions

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Acknowledgments

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About Ceres

Ceres is a nonprofit organization working with the most influential capital market leaders to solve the world's greatest sustainability challenges. Through our powerful networks and global collaborations of investors, companies, and nonprofits, we drive action and inspire equitable market-based and policy solutions throughout the economy to build a just and sustainable future. For more information, visit ceres.org and follow @CeresNews.

About the Ceres Accelerator for Sustainable Capital Markets

Ceres is a nonprofit organization working with the most influential capital market leaders to solve the world's greatest sustainability challenges. The Ceres Accelerator for Sustainable Capital Markets is a center of excellence within Ceres that aims to transform the practices and policies that govern capital markets to reduce the worst financial impacts of the climate crisis. It spurs action on climate change as a systemic financial risk—driving the large-scale behavior and systems change needed to achieve a net zero emissions economy through key financial actors including investors, banks, and insurers. The Ceres Accelerator also works with corporate boards of directors on improving governance of climate change and other sustainability issues. For more information, visit ceres.org/accelerator.

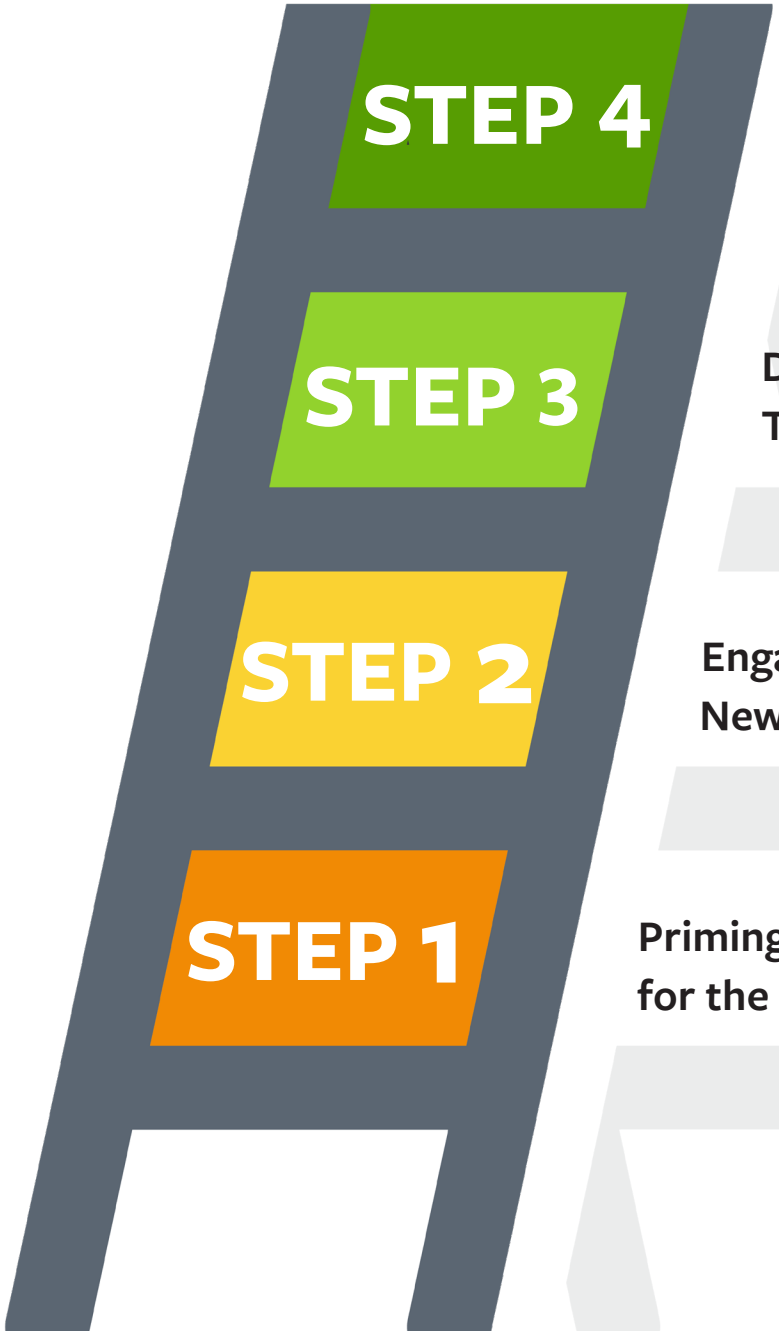
Introduction

The global transition to a low-carbon economy will provide banks with an enormous commercial opportunity, as borrowers seek new financing for both sustainability and climate solutions. Evidence of this is already available. In 2022, banks earned an estimated $3.3 billion in fees on $580 billion of green financings, exceeding the $2.5 billion of fees generated from raising debt for fossil fuel companies.

Although significant, these fees pale in comparison to the revenue available to financial institutions as the global economy accelerates its push towards decarbonization. To put this opportunity into perspective, by some estimates, reaching net zero by 2050 will require a whopping $275 trillion of spending on low-emission physical assets, on everything from electrifying global grids to clean manufacturing to climate-smart agriculture, leading to an unprecedented potential boon in climate financing for the banking sector. However, this growth is not guaranteed, and the current uncertain macroeconomic and geopolitical environment is giving some banks pause. But what is clear is that banks that take the business-as-usual approach and choose not to fully embrace sustainable finance will miss out on the biggest opportunities.

The goal of this guide is to help U.S. banks, credit unions, and minority depository institutions position themselves to take full advantage of this unprecedented commercial opportunity, irrespective of business model, asset size, or geography. Although focused on lenders, this guide should prove useful to other financial institutions as well. Using the framework of an opportunity ladder, this document provides specific examples of innovative financial products and services, as well as a description of the infrastructure and internal resources financial institutions will need to unlock them. Regardless of where banks are on the opportunity ladder, this guide is designed to help them engage existing borrowers, onboard new clients, and drive revenue growth.

Low-Carbon Economy Transition Opportunity Ladder



Optimizing the Bank for the Low-Carbon Economy

Deploying the Bank's Transition Strategy

Engaging Clients with New Products and Services

Priming a Bank's Organization for the Transition

1 Priming a Bank's Organization for the Transition

Not all financial institutions are currently at step one. There are a significant number of credit unions, mid-sized banks, and community banks that have yet to develop any meaningful level of climate competency. (Note that at times, we will use the term "bank" interchangeably with financial institution.) Without a comprehensive understanding of how the upcoming low-carbon transition will impact an institution, it will not be possible for the bank to position itself to engage borrowers regarding climate solutions or transition-related opportunities. This first section is designed to showcase the increasingly material commercial opportunities available to financial institutions willing to grasp that (very accessible) first rung of the opportunity ladder.

Opportunity Set

The central thesis of step one is that banks should start exploring ways to capitalize on the low-carbon transition while leveraging existing strengths and core competencies. For example, banks could expand lending in industry sectors they already specialize in by adding select innovators with a low-carbon business model. The primary revenue driver in step one is scaling a bank's existing products and services across a larger set of relationships, without incurring additional staffing costs.

- **Example:** Banks could add renewable power generation borrowers to an existing power and utilities lending portfolio. Since the passage a year ago of the Inflation Reduction Act, with its combination of tax incentives and tax credits designed to spur consumer demand and corporate investment in clean technologies, around $350 billion in new capital investments have been announced in American solar, wind, and battery storage projects.

For those banks that have already successfully onboarded low emissions-intensity borrowers in their portfolio of core industries (as described above), they can continue to increase revenues by branching out further into the low-carbon economy and lending to borrowers in related sub-industries that are not current bank clients.

- **Example:** Banks that currently lend to the software industry could consider further leveraging their in-house expertise by expanding into the smart grid software sector. Upgrading and digitizing the grid is critical to shifting to an electric power system, with advanced distribution management systems a foundational piece of the puzzle. The Department of Energy's Smart Grid Grant program, which is part of the Infrastructure Investment and Jobs Act, plans to invest up to $3 billion by 2026 in support of grid resilience technologies and solutions, making these borrowers much more credit worthy than previously understood.

Again here, the primary revenue driver will be scaling existing bank products and services (such as fees from lending and investment banking advisory services) across a much larger set of low emissions-intensity relationships, without a corresponding increase in the bank's emissions. The infrastructure needed to support these efforts is discussed below.

Internal Infrastructure, Resources, and Governance

To ensure applicability to financial institutions of all types, this guide will dispense with specific employee designations (for example, commercial bank relationship manager and credit officer), instead referring to financial institution employees as being part of either the first, second, or third lines of defense.

- **First line of defense (1LD):** This includes client-facing staff, such as relationship managers or other front office employees.
- **Second line of defense (2LD):** Credit risk managers, market risk managers, legal staff, and compliance.
- **Third line of defense (3LD):** Independent audit and risk assurance.

For most banks, realizing the step one opportunities highlighted above would require no additional investments in the number of 1LD, 2LD or 3LD staff. (Perhaps at the margins, it may be necessary to recruit a handful of relationship managers and credit risk officers with specific knowledge of new sub-industries.) However, we do recommend investing in capacity building and expanding the skillset of current staff to be more conversant with climate risk management and low-carbon economy business topics, disclosure standards, and regulatory developments.

There are several ways in which a financial institution can accomplish this:

- **Leveraging existing knowledge:** Via the HR department, obtain an inventory of existing staff skills related to sustainability. For example, staff members with formal training in environmental science, renewable energy, carbon accounting, or sustainability frameworks.
- **Build New Capacity:** This can be done by inviting outside subject matter experts to present to existing staff. Banks could also encourage staff to attend industry conferences and workshops or earn sustainability certifications (such as the Fundamentals of Sustainability Accounting Credential or the CFA Certificate in ESG Investing).

From a governance standpoint, financial institutions should ensure that both senior management and the board of directors are fully advised and consulted on this strategic shift (however minor it may seem). Depending on the composition of senior management and the board, it may also be necessary to provide capacity building to ensure a full understanding of the commercial opportunities the bank is now pursuing. There are many excellent programs available, including:

- Building Board Expertise on Sustainability via Ceres and the University of Michigan Stephen M. Ross School of Business.
- ESG Executive Certificate for Senior Leaders via the Wharton School of the University of Pennsylvania.
- Driving Sustainability from the Boardroom via the International Institute for Management Development.

Finally, banks would benefit from having an in-house sustainability expert (or even better, a chief sustainability officer) to coordinate and guide their commercial growth strategy. This person can help the bank create a sustainable finance framework that can guide the bank's strategy and identify the opportunities most likely to result in real-economy emissions reductions.

Why Might FInancial Institutions Want a Chief Sustainability Officer?

Many companies (including financial institutions) have created a new position—chief sustainability officer—to coordinate and streamline information sharing within the organization. Among other capabilities, a credible CSO will have the ability to connect the bank's sustainability efforts with the company's material stakeholder goals, such as the creation of long-term enterprise value. For a more complete description of a CSO's responsibilities, please consult this Harvard Business Review article.

Measuring and Managing Progress

In step one, banks should model good practice vis-a-vis lowering their direct emissions. This may include undertaking energy efficiency programs or purchasing renewable electricity for their operations. In addition to lowering operational costs, reducing scope 1 and 2 emissions (direct emissions from a bank's offices and branches) is an important way for banks to signal to clients and other stakeholders that they are preparing for the transition to a low-carbon economy. As banks learn, they can share insight with clients, and communicate the value they have unlocked to their stakeholders. Banks can be an example for their clients to follow.

To get ready for the next step on the opportunity ladder, banks should also begin actively evaluating the progress the clients they are lending to are making (or not) in the transition to a low-carbon economy. This can be done both at a sector and borrower specific level. At a sector level, banks should be able to conduct qualitative or quantitative analysis to ensure they understand which sectors are most likely to be impacted by the transition. Many banks use tools such as Moody's Environmental Risk Heat Map to make these determinations. Ceres has also used the Climate Policy Relevant Sectors framework, as it is more granular and includes climate solutions in addition to mapping climate risk.

Once a bank has determined which sectors are the focus, it can start to understand the progress the borrowers in those industries are making in reducing their emissions. These are the emissions that are counted as part of banks' scope 3 emissions—these financed and facilitated emissions result from banking services that are provided to borrowers. As scope 3 emissions are often over 700 times higher than a bank's direct emissions, (the scope 1 and 2 emissions mentioned above), the goal is to be able to reduce total bank-wide scope 3 emissions for all borrowers, with a commensurate reduction in real-world emissions. In some cases, this will involve developing new financial products (step two) and additional financing to help borrowers transition (step three).

To unlock further commercial opportunities, banks should start assembling a set of internal resources that could support proactive client engagement in pursuit of additional decarbonization-related opportunities. For example, to increase the volume of home equity line of credit (HELOC) lending, a bank could develop marketing material highlighting the consumer benefits of energy efficient home renovation tax credits contained in the Inflation Reduction Act. Researching the provisions of new or upcoming sustainability legislation could also lead to the development of innovative sustainability finance products, which is the subject of the next section.

2 Engaging Clients with New Products and Services

When a financial institution reaches step two, heightened fluency with sustainability- and climate-related topics will lead to more meaningful client engagement and the development of bespoke finance products. Of course, building this new commercial capability will require the bank to have a clear climate strategy. In addition to the capabilities described in step one, it is here that the second line of defense will need to develop the ability to assess how climate-related financial risks—specifically physical and transition risks—impact borrower probability-of-default and loss-given-default. In addition to the bank's credit risk management team, the entire second line of defense will need to be well versed in sustainability topics across all control functions. For example, the bank's legal team will need to understand how to draft borrower agreements that incorporate sustainability and climate covenants, and the compliance department will need to monitor the first line of defense to ensure it does not engage in greenwashing (by accidentally or intentionally misrepresenting the sustainability benefits of a bank's products and services—which happens more than one would think). Once this is done, the bank will be able to unlock commercial opportunities driven by the financing of climate solutions and the provision of sustainability finance products.

Opportunity Set

Having already expanded existing products and services across a broader client base (step one), step two will see the bank leverage the office of the chief sustainability officer to provide financing in support of new climate solutions and develop innovative sustainability finance products. Of course, the climate solutions and sustainability finance products that the first line of defense develops must be fully aligned with the financial institution's overall corporate strategy, stakeholder needs, and business model.

Climate Solutions: The most basic way for banks to finance climate solutions is through the issuance of green bonds and other forms of sustainability-oriented project finance. Green bonds are similar to conventional corporate bond issuances in terms of pricing and structure, with the notable exception that green bonds are restricted to financing projects that address climate change or have a positive environmental impact. (Both International Capital Market Association (ICMA) and Climate Bonds Initiative (CBI) provide guidance on what constitutes a green bond). This market was first established in 2008 via a bond issuance from the World Bank. Since then, $2.5 trillion of green bonds have been issued worldwide by governments, companies, international organizations, and financial institutions.

Sustainability Finance Products: Many borrowers do not directly provide climate solutions but are nonetheless interested in preparing their business for the transition. Financial institutions can develop innovative new financial products that help these borrowers achieve their sustainability and climate goals. We refer to these as sustainability finance products, and they include climate finance, transition finance, and nature-based solutions. An existing example of such an innovation is the use of sustainability-linked bonds. For borrowers looking to finance sustainability initiatives while (potentially) lowering their cost of capital, it is possible to finance a decarbonization strategy via the issuance of sustainability-linked bonds (similarly, borrowers can raise financing from banks using a sustainability-linked loan). Here, the best practice is to materially link debt pricing to the success of a borrower's sustainability initiatives as measured by a set of pre-determined key performance indicators. This market, although relatively new (the first sustainability-linked loan was issued in 2017), has exploded in popularity in recent years ($322 billion of loans in 2021) and presents an excellent commercial opportunity for banks.

Along with being known for sound risk management, banks and credit unions have long excelled at financial innovation—and there is no reason this should not include sustainability finance innovations as well.

Innovative Product: Citizens Sustainable Deposits

Citizens Bank, the 14th largest bank in the U.S., partners with its clients to prepare for and finance the transition to a lower carbon economy by delivering advice, developing products to meet client needs, and financing technologies and companies that are advancing lower carbon solutions. Rachel Mattes Greenberg, Citizens' Head of Sustainability, says the business case is clear: "Working with our clients on climate helps them achieve their objectives and generates long-term financial returns for our shareholders, while also driving positive climate impacts. As demand for sustainable solutions grows, so does the need for new enabling technologies, products and services, and infrastructure." In 2021, Citizens launched Green Deposits, a product that enables commercial and public sector clients to direct their cash reserves in support of companies and projects focused on driving positive climate and other environmental impacts. In 2023, the product was expanded and relaunched as Sustainable Deposits and now includes categories such as affordable housing and employment generation, in addition to renewable energy and green buildings. As of June 30, 2023, the Sustainable Deposits total balances were $680 million, which is 47% of the eligible portfolio amount. The product is governed in accordance with Citizens' Sustainable Deposits Product Guide and Sustainable Deposits Eligibility Criteria, which were developed with the support of Sustainalytics, a leading provider of ESG research and data. The documents define the eligible lending activities and guidelines for application of client deposits to ensure alignment with industry best practices.

For those seeking inspiration for financial innovation, reviewing upcoming climate-related regulatory developments and proposed clean economy legislation is a great input into the origination and development of new sustainability products and services. For example, the U.S. Inflation Reduction Act is expected to be transformational in scale, with some estimates suggesting it will stimulate as much as $11 trillion of total clean tech infrastructure investments by 2050. In the near term, the Inflation Reduction Act has already unlocked several new financing opportunities for financial institutions:

U.S. Inflation Reduction Act: In August 2022, President Biden signed the Inflation Reduction Act into law. This historic legislation provides significant savings opportunities and tax incentives for companies and households wanting to invest in climate resilience, clean energy, and low-carbon technologies. Among other areas, the Inflation Reduction Act will stimulate consumer demand for clean vehicles, energy-efficient home improvements, and residential clean energy—including in disadvantaged communities. Consequently, for financial institutions wanting to develop sustainability finance products for consumers, opportunities now exist for:

- **EV automobile-based lending products.** A recent Goldman Sachs report estimates that EVs will represent half of global car sales by 2035, representing a significant growth opportunity. Some banks and credit unions already offer lower interest rates for EV loans.

- **Mortgages promoting energy efficiency and climate resiliency**. For example, residential mortgages with interest-rate reduction incentives linked to the installation of solar panels, heat pumps, or energy efficient windows and appliances. In addition to the cost savings benefits for the homeowner, research shows benefits for banks as well—default rates are 34% lower for energy efficient homes, all else being equal.

In addition to these popular consumer finance provisions, the Inflation Reduction Act contains equally powerful provisions designed to decarbonize other key sectors of the economy and create new markets. Whether it's decarbonizing steel using electric arc furnaces, decarbonizing commercial real estate with new energy efficiency incentives, or decarbonizing aviation with sustainable fuels, there are specific financing opportunities in many sectors that can have profitable financial products built around them.

Financial Opportunities in the Aviation Industry's Clean Energy Transition

To support the production and use of sustainable aviation fuel (SAF) the Inflation Reduction Act provides tax credits for companies that blend or produce sustainable aviation fuel, as well as a grant program to entities that develop low-emission aviation technologies (see the U.S. SAF Grand Challenge program for more information).

For banks wanting to develop new corporate sustainability finance products, this segment of the Inflation Reduction Act has the potential to support some very innovative commercial opportunities. Some $5 trillion of capital investment may be needed to deliver the aviation industry's goal of reaching net zero by 2050, and the production of clean jet fuel is a key part of these decarbonization efforts. Financing this particular climate solution represents a significant opportunity for financial institutions.

Another commercial opportunity for financial institutions lies with the development of bank-provided sustainable aviation fuel hedging products for airline borrowers, such as clean jet fuel options and forwards to protect against price volatility. As fuel costs represent approximately 25% to 30% of an airline's operating expenses, developing such novel hedging products would not only increase a bank's revenues in this sector—it would also help the bank manage the credit risk associated with its airline industry borrowers.

Speaking of credit risk management, although the increasing use of SAF by the airline industry is positive from a climate-risk management standpoint, as clean jet fuels are currently (at least) twice as expensive as normal jet fuel, it could lead to a significant increase in airline operating costs in the short term, which could negatively impact the borrower credit ratings of some airlines. This follows the pattern of many new technologies, which are initially expensive and subsequently get cheaper as they are scaled. It also shows why climate risk needs to be fully integrated into existing risk processes, rather than treated separately.

Lastly, this example also showcases the feedback loop mechanism between opportunity origination and risk management and underscores why we believe that in step two, a bank's first line of defense and second line of defense both need a high level of sustainability fluency and internal cooperation to ensure that the portfolio impacts of new commercial opportunities are fully understood.

These are but a few potential commercial opportunities driven by the Inflation Reduction Act. It is worth acknowledging that there are also some very real barriers that need to be overcome to capture these climate-related opportunities. Early-stage technologies often don't fit within the risk appetite of a commercial bank, and there may even be regulatory barriers to certain types of investment. In step four, banks will develop the tools to quantitatively assess the risk/return tradeoffs presented by climate solutions, but at this stage the (considerable) benefits can be qualitatively weighed against the credit, market, and political risks that may exist.

There are countless commercial opportunities for banks to unearth by reviewing the sectors most in need of investment (see chart below) to climate-related regulatory developments and advocating for proposed sustainability legislation.

Figure 1. Annual average investments in energy transition technologies. Credit: IRENA Low-Cost Finance for the Energy Transition, pp. 57-58.

Power

		Annual average investments USD billion/yr 1.5 C scenario 2021-50
Power generation capacity	Solar PV (utility and rooftop)	$237
	Wind onshore	$212
	Wind offshore	$177
	Hydro - all (excluding pumped)	$85
	Concentrated Solar Power	$84
	Biomass (total)	$69
	Marine	$59
	Geothermal	$24
Grids and flexibility	Electricity network	$600
	Flexibility measures (e.g. storage)	$133

End uses and district heat

Annual average investments
USD billion/yr
1.5 C scenario 2021-50

Renewables end uses and district heat	Biofuels - supply	$87
	Renewables direct uses and district heat	$84
Energy efficiency	Buildings	$963
	Industry	$354
	Transport	$157
Electrification	Charging infrastructure for electric vehicles	$131
	Heat pumps	$102
Innovation	Hydrogen - electrolysers and infrastructure	$116
	Hydrogen-based ammonia and methanol	$45
	Bio-based ammonia	$22
	Bio-based methanol	$12
Carbon removals	Carbon removals (CCS, BECCS)	$65
Circular economy	Recycling and biobased products	$25

Internal Infrastructure, Resources, and Governance

The most important internal resource needed to successfully execute step two is an enterprise-wide strategy, containing time-bound goals and specific targets, for addressing the risks the bank is exposed to through its lending and other business activities, as well as for capturing the financial opportunities of the transition. Goals are needed to create credibility for the bank—clients won't consider the bank to be a clean economy leader without them. Additionally, targets create a business justification for internal behavior change. They signal to employees that climate needs to be taken seriously.

The details of such a strategy will be unique to each financial institution, but best practice would be to incorporate the key elements described below. As a bank moves through steps two to four, each of these elements will gradually become more robust. For a more detailed guide to climate commitments for financial institutions, please review Ceres' Net Zero Standards for North American Banks and the U.S. Treasury's Principles for Net-Zero Financing & Investment.

1. **Decarbonization goal:** The bank should establish a comprehensive commitment to net zero by 2050 (or sooner) that is consistent with the Paris Agreement goal of limiting warming to 1.5°C to avert the worst impacts of a changing climate. This commitment should cover all material products and services (all material on- and off-balance sheet activities) and operational emissions. If this cannot be achieved, the bank should explain why.

2. **Interim targets:** The bank should establish short-, medium-, and long-term targets for reducing the real-economy emissions associated with its products and services in a manner that puts it on a pathway to achieve its net zero commitment.

3. **Exposure and emissions disclosure:** The bank should disclose both the financed and facilitated emissions associated with all material business activities. We recommend that banks disclose financed and facilitated emissions separately. The bank should also report annual progress towards all of its stated emissions targets.

4. **Decarbonization strategy:** To deliver on its targets and commitments, the bank should independently establish and disclose decarbonization strategies specific to each business activity. The precise approach adopted will vary by institution, but the underlying expectation is that the bank should support its clients as they align their strategies to a 1.5 °C pathway (support those borrowers' transition plans).

5. **Climate solutions, new products, and services:** The bank should establish specific targets and milestones related to the development and financing of climate solutions, and report progress at least annually. Ultimately, sustainability and climate solutions should account for an increasing percentage of the bank's total revenue, and, over time, these products and services should become part of the bank's standard offering rather than a specialty product or service (see step four of this guide for more information).

6. **Responsible policy engagement:** The bank should establish a clear, enterprise-wide, and transparent lobbying policy in line with the goal of transitioning to a low-carbon economy and limiting warming to 1.5°C and it should assign board level responsibility for oversight of lobbying approach and activities. For more information, please see Ceres' 2023 brief on Responsible Policy Engagement Benchmarking for Banks.

7. **Enhanced board governance:** The bank should ensure that there is dedicated and expert oversight of its climate strategy at the board level, that progress is discussed regularly at board meetings, and that compensation systems are in place to ensure that climate goals are met. When allocating capital to the most profitable commercial opportunities, the bank should ensure that climate-related financial risks are included in its risk-adjusted calculations.

8. **Just transition:** The bank should develop enterprise-wide policies that support a just transition to a low-carbon economy for all stakeholders, especially those from low-to-moderate income communities who are most impacted by climate change.

To be clear, establishing and communicating (at least internally, but preferably publicly) a credible, science-aligned, and enterprise-wide climate strategy is a prerequisite to success in step two and beyond. Without such a wide-ranging and comprehensive strategic approach, a bank will not be able to coordinate the necessary activities within its first line of defense and second line of defense to realize the new commercial opportunities available from financing climate solutions or developing sustainability finance products.

Measuring and Managing Progress

For a bank to accelerate its client engagement and generate new revenue from climate solutions and sustainability finance products, the first line of defense sustainability team will need comprehensive borrower data. The most foundational dataset a bank will require is a borrower's emissions data (specifically scope 1, 2, and 3 GHG emissions data). While more holistic assessments of climate performance are also needed (see step three), we think emissions are the logical place to begin. In simple terms, quantifying the volume and sources of emissions produced by a bank's borrower in pursuit of its business goals will help the bank understand its borrower's business model at the level of granularity needed to create bespoke sustainability and climate finance products and provide related transition guidance (again, see step three).

As mentioned earlier, the second line of defense will also need to develop the ability to incorporate climate-related financial risks into borrower probability-of-default and loss-given-default. Again, in simple terms, the carbon accounting data from the bank's borrowers will round out the credit department's assessment of how physical and transition risks could impact a borrower's credit worthiness.

There are considerable resources available to assist borrowers in preparing this much-needed information. For example, the Greenhouse Gas Protocol provides detailed guidance on how companies should measure their emissions. There are also independent frameworks designed to assist banks in internalizing borrower emissions data. The Partnership for Carbon Accounting Financials (PCAF) provides a useful data quality scale that banks can use (which prioritizes company-reported data, such as directly measured emissions, with estimates based on production and estimates based on revenue coming in second and third place).

We recommend that the financial institution's first line of defense directly engage with borrowers to obtain this data. This is the best way to clearly communicate the importance of acquiring this data for the bank. In the regular course of business, a bank asks for a borrower's financial accounting statements. So, it makes sense that it should ask for their carbon accounting statements as well.

In terms of where the first line of defense client engagement process should start, the best practice for banks is to:

1. **Focus on the bank's most material borrowers.** This could be in terms of return on equity, credit exposure, or climate risk. For example, if climate risk materiality is the bank's starting point, the bank will need to ensure that it includes borrowers from the following sectors: agriculture, aluminum, cement, coal, commercial real estate, residential real estate, iron and steel, oil and gas, power generation, and transport. Many banks currently base their client engagement on this approach. For example, Citi has created a Natural Resources and Clean Energy Transition Team to help clients execute transition strategies and JPMorgan now has groups of banking professionals focused solely on renewable energy and sustainable agriculture (among other areas).

2. **Start with the bank's bilateral relationships.** The bank should approach borrowers that they have a strong relationship with first. For example, where the bank is the only lender. These borrowers are more likely to prioritize new requests for information, such as carbon accounting-related inquiries. From there, the bank can move forward to the borrowers with small bank lending syndicates (such as one to two other banks).

3. **End by talking to every borrower, no matter how small.** Banks should aim to have an introductory conversation with every borrower to ensure they have a complete understanding of the unique challenges and opportunities facing their client base. At a minimum, this outreach should serve as a fact-finding exercise that will help banks determine borrowers' familiarity and fluency with carbon accounting.

In practice, most financial institutions will move through the borrower emissions data collection process in unique and uneven ways. It is possible that mandatory emissions disclosure regulations could make the task easier, as is the promise of California's recent climate disclosure laws, but the process will most likely be iterative. However, a bank should not let the complexity of the task prevent it from moving forward, as this is vital to measuring and managing the success of both opportunity identification and enhanced risk management.

The raw emissions data (absolute emissions) that a bank obtains won't--in isolation--be able to fully inform the bank's lending or risk management efforts. For that, a bank will need to synthesize its borrower's emissions data in two main ways:

1. **Calculate emissions intensity.** Emissions are directly related to the size of a company and how fast it is growing. This makes it hard to compare companies to each other, so it is often helpful for banks to look at a client's emissions on a per unit of production basis. For example, emissions per megawatt-hour of electricity, or emissions per barrel of oil. This can also provide additional insight into the borrower's energy efficiency.

2. **Generate a borrower emissions time series.** Generally, if a client's absolute emissions and emissions intensity are declining over time (especially when compared to a sectoral trend), this is a positive sign that their transition plan is working and that a bank's climate solutions (products and services) are having the desired impact.

Each metric comes with strengths and limitations. One advantage of intensity metrics is economic efficiency—asking all companies to reduce their (absolute) emissions at the same rate is likely to be highly inefficient, because the costs of doing so can vary greatly across companies. Intensity metrics may also reduce the problem of transferred emissions, or leakage, where emissions are not reduced but are transferred to other firms that may face less scrutiny. Ultimately, though, absolute emissions are what matters for the climate. If a business grows fast enough, emissions intensity can decrease while absolute emissions rise.

One measure of borrower progress that Ceres recommends banks not place undue reliance on are ESG scores. Third-party ESG scores are often used to determine which companies are eligible to be included in ESG-themed asset management products, but the specifics of what they are measuring is often unclear. Moreover, the evidence shows that different ESG assessments of the same company from different raters do not correlate in the same way that credit ratings from nationally recognized statistical rating organizations typically do.

3 Deploying the Bank's Transition Strategy

In step three, each financial institution will have access to a larger and higher yielding set of commercial opportunities related to the transition to a low-carbon economy. However, realizing them will require the bank to develop and deploy a firm-wide, coordinated transition finance strategy. Specifically, it is at this step that the bank's first line of defense will need to decide which borrowers will be allocated more capital and which sectors will be deprioritized. It is also here that the bank's second line of defense will need to start incorporating sustainability into its core processes, for example, the strengthening of environmental and social risk management (ESRM) policies and the use of enhanced due diligence (EDD) to systematically evaluate clients' climate strategies.

Opportunity Set

We believe that all financial institutions—from small credit unions to Global Systemically Important Banks (G-SIBs)—will need to devise a strategy to successfully transition to a low-carbon economy. Whether a financial institution is a large bank lending to a portfolio of high-emitting corporations or a small credit union with a field of membership drawn from a high-emitting industrial company, transition risk exists and addressing it will require a bank's business plan to evolve.

Successfully accessing the opportunity set described in this step does not require the bank to divest from legacy borrowers in high GHG emitting industries. Rather, it requires that the bank actively engage its borrowers in hard-to-abate sectors (industries where phasing out emissions is particularly difficult), help them design a credible transition plan (a formal strategy that will allow them to transition their current business model so that they can thrive in a low-carbon economy), and then provide them with the requisite capital to execute on this plan.

The commercial opportunities for banks in the transition finance space are large and unprecedented. For example, according to a 2023 report from the International Renewable Energy Agency, global financing of transition technology for the hard-to-abate energy sector (including through renewable energy, energy efficiency, electrified transport and heat, energy storage, hydrogen, and carbon capture and storage) totaled $1.3 trillion dollars in 2022. This figure is up 19% from 2021 and approximately 70% higher than 2019 levels.

At a macro level, there are two (non-mutually exclusive) types of decarbonization strategies for high GHG emitting industries that will lead to commercial opportunities for financial institutions:

- **Diversification-based decarbonization strategy:** Here borrowers in hard-to-abate sectors can prepare their business model for the transition by diversifying their operations, power supply, and supply chains to include low-carbon emitting processes. For example, a power generation utility that relies primarily on fossil fuel can diversify by adding lower carbon alternatives to its generation mix. Doing so will reduce enterprise-level GHG emissions while making the borrower more resilient to transition risk. For a bank, this transition strategy will lead to commercial opportunities ranging from the provision of equity and debt capital (both public and bank debt), as well as equipment financing and potentially M&A advisory. And of course, properly executed, the strategy will reduce borrower scope 1 and 2 GHG emissions, which will help reduce a bank's exposure to climate risk.

- **Technology and optimization-based decarbonization strategy:** This type of strategy is typically used when a borrower cannot easily diversify its business model to reduce negative impacts or will require innovative, hard-to-scale technology to do so. An example of this kind of borrower would be a mid-sized domestic oil and gas exploration and production company. As its entire business model is reliant on the continuation of the legacy high-carbon economy, diversification is difficult. With diversification off the table, a successful transition plan would require a technology-based solution that would decarbonize the company's production and supply chain, when and if that technology becomes available. Until then, the borrower's only alternative is to focus on process optimization and efficiency initiatives to insulate itself from as much transition risk as possible. For banks, engaging clients in this category will lead to commercial opportunities such as financing the acquisition of new technology, as well as leasing and capex lending to upgrade capital equipment. And as described above, with more energy efficient industrial processes in place, the borrower should be able to reduce its scope 1 and 2 GHG emissions, leading to lower scope 3 GHG emissions for the bank. However, in the short term, this type of strategy could leave an institution with an unacceptable level of residual transition risk, should the proposed technology or efficiency gains not materialize within the desired time window. And of course, in the long term, efficiency gains alone will not materially contribute to a bank's decarbonization goals.

For more information on how financial institutions can formulate effective transition plans, please see these resources:

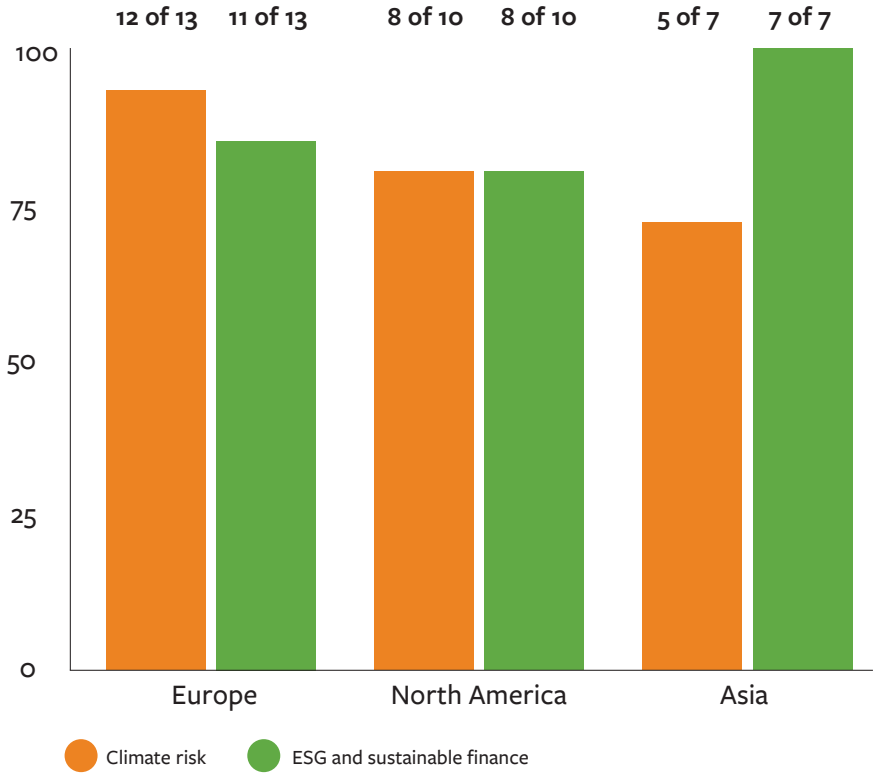
- Financial Institution Net-zero Transition Plans from the Glasgow Financial Alliance for Net Zero (GFANZ)
- PwC's recently published Transition Planning for Financial Institutions
- Ceres' Climate Transition Action Plans (Contact us for information on how to make this bank-sector-specific.)
- U.S. Treasury's Principles for Net-Zero Financing & Investment

Internal Infrastructure, Resources, and Governance

As mentioned, mastering step three will require the formulation of a whole-of-bank strategy around transition planning, including client engagement strategy. The most common way to catalyze this planning is by expanding the in-house sustainability team, beyond the office of the CSO. This approach has already been successfully adopted by several U.S. regional, super-regional, and global banks.

Figure 2. Banks with dedicated climate & sustainability teams. Credit. Board of Governors of the Federal Reserve System

The next step for most banks is to embed a larger team of climate and sustainability experts within the first line of defense. There, they can work to acquire and review borrower transition plans for the financing opportunities mentioned above. Additionally, an expert team based within the second line of defense would be responsible for measuring and monitoring the climate-related financial risk inherent in the bank's client business and using this data to develop the bank's own transition plan.



Integrating Sustainability into the First Line of Defense

In 2020, JPMorgan Chase launched the Center for Carbon Transition (CCT), a center of excellence that works with teams on a wide variety of sustainability focused transactions and green business opportunities. CCT also leads delivery of JPMorgan Chase's commitment to align its financing with the goals of the Paris Agreement and helps clients navigate transition-related challenges and opportunities. Rama Variankaval, the Global Head of the Center for Carbon Transition says, "We see massive amounts of capital formation happening around the decarbonization theme. Resourcing a centralized group of experts helps our large and small clients navigate climate and helps our Firm participate in one of the largest capital flow changes I have seen in my lifetime."

Measuring and Managing Progress

We said at the start of this section that devising a strategy for the transition to a low-carbon economy did not require divesting from high GHG emitting borrowers (which can reduce an individual bank's financed emissions but may have limited impact on real-world emissions). However, some high-emitting assets owned by these borrowers may provide an unacceptable level of climate-related financial risk for both bank and borrower over the long term. In this case, the bank can engage with the borrower to facilitate the managed phase out of these assets, which means retiring them before the end of their useful life, and replacing them with low carbon assets, with minimum impact on net economic value.

If that strategy fails, a bank may conclude that certain borrowers may be unable or unwilling to do what it takes to be successful in a low-carbon economy. For example, a bank's transition analysis may reveal that climate-related physical risks will destabilize a borrower's status quo infrastructure or that climate-related transition risks will negatively impact a borrower's ability to repay debt. In such cases, prudent risk management would necessitate a proactive reduction in a bank's credit exposure to these clients (fully disclosed and over a discrete, transparent time horizon). This risk management strategy is known as active portfolio management.

Examples of Managed Phase Out and Active Portfolio Management in Action

Q: Given the speed at which the energy transition is taking place, what can financial institutions do to help borrowers divest of long-lived corporate assets, such as coal power plants or oil pipelines, before they reach the end of their economically useful life?

A: Without external assistance, most companies cannot justify early retirement of economically useful assets due to the associated loss of value. However, there are financial strategies that can be deployed to offset those economic losses. Below is one example of a managed phase out strategy:

- Banks could form a syndicate with a multilateral development bank (MDB) to provide managed phase out transition financing. This strategy has been successfully executed in the Philippines in 2022 as part of a local power producer's transition to renewable energy generation.

More broadly, commercial banks could provide advisory services to borrowers looking to address transition risk at the asset level, while an MDB provides capital. As MDBs are currently being encouraged to adopt a triple mandate, which would support UN Sustainable Development Goals, as well as Paris Agreement goals in future financing, such managed phase out financings may become easier to structure and execute.

Q: When would it make the most sense for a financial institution to implement an active portfolio management strategy for the handful of borrowers who are unable or unwilling to transition?

A: Implementing an active portfolio management strategy is not a decision that should be taken lightly and is akin to moving a borrower into an institution's special account management (work out) group. In terms of the optimal timing of implementing such a strategy, we view unhedged transition risk as a generator of negative financial returns over the long run. Said differently, unhedged transition risk has negative time value and so causes a portfolio to devalue as it moves through time.

The following hypothetical example illustrates this situation:

- Assume a bank lends to an independent electric power producer that relies 100% on coal to generate energy for its customers.
- This borrower is unable or unwilling to formulate a credible transition plan for pivoting its business model for success in a low-carbon economy.
- The bank is concerned about the significant amount of transition risk associated with this borrower (arising from the emissions generated by using coal as feedstock).
- One alternative would be to implement an active portfolio management strategy immediately, based on the risk management concerns of the second line of defense. This would be the most expedient method of hedging the bank's transition risk exposure to this borrower.

Q: The financial institution is concerned it will lose future revenue opportunities if it hedges its transition risk using an active portfolio management approach. Is there not another solution?

A: Continuing with the example above, the bank could purchase credit-default insurance on this hypothetical borrower. However, we caution that this approach could simply be delaying the inevitable, as we outline below:

- Assume that, to try to hedge transition risk, the bank purchases credit-default protection on the hypothetical power producer and pays an insurance premium to the third-party protection provider.
- Over time, the concerns of the bank's second line of defense are shown to be accurate. Consumer preference continues to shift to renewable energy as costs are lower relative to coal-fired power generation. Credit spreads for the borrower widen and the bank's cost of renewing the credit insurance escalates.
- Eventually transition risk for coal-fired power rises to a point where no third parties are willing to provide credit insurance (similar to the coverage withdrawal that is happening today with residential insurance providers in states like Florida and California).
- At this point, the bank is back to its original starting point of holding the full amount of transition risk for the loan. It may have earned some additional fee revenue, but this must be netted against the cost of the insurance premiums and the (likely) negative mark-to-market on the principal value of the loan.

In the abstract, it's hard to tell whether hedging transition risk via active portfolio management or via credit insurance produces the better risk-adjusted return in this hypothetical example. But it should be clear that the only way to guarantee the removal of transition risk from the bank's portfolio is to ensure borrowers have transition plans in place (with financing support from the bank), or to implement a managed phase out or active portfolio management strategy.

As a bank evolves its systems to unlock transition-related commercial opportunities, it must ensure that the risk management side keeps pace. If transition planning, client engagement, and active portfolio management are applied unevenly across the bank, financial returns will not be optimized and bank staff who are not sustainability fluent may not be clear as to what is expected of them. Consistency can be assured via the adoption of third-party principles or the establishment of internal risk management policies that cover climate, which can be publicly disclosed. Incorporating climate-related financial risks into risk management policies will require a review of the bank's list of activities requiring extra due diligence and any prohibited activities.

Banks like Citi, JPMorgan, and Bank of America have disclosed policies that prohibit most coal financing and require enhanced due diligence in several other areas. We recommend that all banks expand their policy to phase out coal (current political pressure notwithstanding) and carefully evaluate borrowers and transactions associated with high levels of climate-related financial risk.

We mentioned in step two that emissions data needs to be supplemented with a more holistic assessment of a client's transition strategy. This assessment is typically done through the enhanced due diligence process and should cover each of the eight key elements listed on page 13. For consistency and credibility, a bank should assess its clients' progress across all areas that are strategically important to the bank itself. While this may seem burdensome, Ceres' research has shown that much of the needed data already exists and borrowers are already being asked for it by the largest global banks. Banks can reduce the impact on clients by harmonizing asks across the sector, supporting the development of data solutions, and developing expertise to make estimations when required.

In addition to improved risk management, through the additional information it asks borrowers to provide, the bank will be communicating the qualitative and quantitative data points that it finds useful in determining borrower transition risk. This can help borrowers develop a more credible transition plan. An example of how this signaling could work is included below:

- Unintended methane leaks (different from methane flaring, which is intentional) are a major source of emissions (and foregone revenue) for the natural gas industry. However, it may be a low priority item for many companies.
- A bank could focus additional borrower attention on this issue (to reduce transition risk or simply to increase borrower EBITDA), by including methane emissions data in the bank's enhanced due diligence assessments.
- This signals that the issue may impact access to (and cost of) capital and will increase borrower management's interest in monitoring such issues going forward.

Lastly, the gradual strengthening of ESRM policies can be part of a bank's strategy to achieve its decarbonization goals.

4 Optimizing the Bank for the Low-Carbon Economy

Step four is the final step on this guide's opportunity ladder. It is where climate-related opportunity identification and risk management are fully integrated into the bank's organization. At this level of integration, the bank's first line of defense will be providing borrowers with financial products and services that not only address their financing needs, but also fully align with the borrower and the bank's decarbonization goals and targets. Additionally, the stakeholders will start to see evidence that the bank's second line of defense is measuring borrower profitability on a climate-related financial risk adjusted return basis. The bank's credit portfolio optimization process (loan syndication, capital allocation, active management, etc.) will also fully support the bank's strategy for the transition to a low-carbon economy. And, last but not least, at this point in the bank's evolution, the third line of defense's involvement will be critical in protecting the organization by ensuring that internal audits include climate in their evaluations. At this optimal level of integration, a financial institution will be exceptionally well positioned to help borrowers navigate the transition to a low-carbon economy.

Opportunity Set

Once a bank's climate solutions financing is driving revenue growth, the bank can focus on generating better climate-risk adjusted borrower returns by leveraging the combined skills of the first line of defense and second line of defense to optimize the internal allocation of risk capital.

Although applying this strategy to the low-carbon energy transition may be a novel idea, the concept itself is not new. Post-2008 financial crisis, as many financial institutions finalized implementation of Basel III capital rules, internal restructuring teams were formed. These teams were composed of client-facing bankers (first line of defense) and internal risk managers (second line of defense) who pro-actively approached large credit exposure borrowers to reduce the amount of risk-weighted assets (RWA) associated with that client. The basic math guiding these efforts was that persuading the borrower to restructure their loans would allow the bank to reduce its risk-weighted assets. For example, this could be accomplished by reducing the tenor or principal amount of the loan. As long as the associated borrower revenue did not decrease significantly, overall client returns would increase (or not change) as the amount of risk capital the bank had to hold decreased.

With sustainability-fluent first line of defense and second line of defense staff, climate-aligned return metrics and systems, and internal compensation plans that reward reductions in enterprise-level climate-related financial risks, the same strategy described above to manage risk-weighted assets can be used to optimize the bank's loan portfolio for the low-carbon economy.

For instance, a banker could work with a borrower to incorporate climate provisions (such as GHG emission reduction targets) into an existing credit agreement, helping the bank achieve its sector de-carbonization targets. Or the bank could reward its mergers and acquisition team for executing client transactions that help borrowers with the managed phase out of high-emitting legacy assets (in alignment with the borrower's transition plan and aligned with the bank's transition risk reduction goals).

Without these enhanced bank models, it will be difficult for management to quantify the full impact of the first line of defense and second line of defense's origination and portfolio optimization efforts.

Optimizing Pricing Models for the Low-Carbon Economy: A Look at a Bank's Capital Markets Business

Banks with an over-the-counter derivatives trading business will be familiar with credit valuation adjustments (CVA). CVA is a transaction level charge, designed to protect a bank in the event that the derivatives counterparty suffers a credit downgrade or a default. At its most basic, CVA is like the loan-loss reserve a bank uses to protect itself against a borrower loan default.

Intuitively, heightened exposure to climate-related financial risk increases the probability that a bank's derivative counterparty will default or have its credit rating downgraded over the long term. However, most existing bank CVA models have not been updated to incorporate climate-related risk factors.

From a risk management standpoint, this is problematic, as the underestimated probability of default will lead to insufficient CVA reserves being set aside—putting the bank at greater risk in the event of a sudden climate shock.

It is also problematic from a commercial opportunity perspective. In the status quo, a bank might not approve the additional credit lines required to support a borrower's foreign currency hedging, even if it lowers the total cost of the financing. However, with updated CVA models that assign value to the reduction of transition risk, a bank's first line of defense could provide a transition financing package that includes both lending and currency hedging. Such a model would not only better reflect the bank's lowered transition risk, but it would support a more competitive financing package for the borrower. This is one example of how an optimized CVA model could benefit a bank's commercial origination efforts as the world transitions to a low-carbon economy.

For a more in-depth understanding of the link between climate related financial risk and derivatives please see Ceres' 2023 report, Derivatives & Bank Climate Risk.

Finally, there are significant commercial opportunities to be realized by optimizing a bank's policy engagement and lobbying activities. A bank's public affairs team and second line of defense can work collaboratively with regulators and policymakers to proactively leverage its direct and indirect lobbying efforts to support of the bank's own decarbonization strategy and create a policy and regulatory environment that supports banks' long-term profitability and ensures a resilient and stable market environment. (For more information, please see Ceres' 2023 brief on Responsible Policy Engagement Benchmarking for Banks.)

The Inflation Reduction Act is a perfect example of the type of legislation that banks can lobby for to maximize their commercial opportunity set. Since last August, the incentives in the climate legislation have led to the announcement of around $350 billion in new clean energy projects that are expected to deliver more than 170,000 new jobs.

Ensuring full alignment between the bank's clean economy goals and targets and lobbying activities is not only sound risk management policy, but also an excellent way to give the bank (and all U.S. financial institutions, for that matter) a commercial edge as the world transitions to a low-carbon economy.

Internal Infrastructure, Resources, and Governance

As already mentioned, internal resources of a fully optimized financial institution would include a highly motivated and climate-smart workforce throughout the 1LD, 2LD, and 3LD. Additionally, the board of directors should be well versed in sustainability and climate topics, and ideally directors would be selected from companies with credible transition plans already in place (and preferably already showing progress).

The board should also approve an enterprise-wide compensation plan that is aligned with the bank's sustainability goals. Although not an exhaustive list, best practice for such a compensation plan would include:

- Compensation claw back features that allow management to retroactively address transactions or activities that appeared profitable at first but have been proven to produce unforeseen and materially negative impacts later (including negative sustainability-related impacts).
- All relevant staff should be assessed against material corporate goals (including attainment of the bank's decarbonization goals) as part of their annual review.

Financial institutions should also continue to deploy their public relations and policy advocacy resources to position their business for commercial success in a decarbonizing world. To do this, banks must work closely with trade associations, lawmakers, and regulators to ensure that climate legislation and regulations are implemented to help advance the bank's enterprise-wide sustainability risk management and commercial origination efforts. While each bank's analysis of which policies best support their goals will differ (based on factors such as geolocation and business strategy), common threads exist. For example, most financial institutions will have an interest in supporting:

- Climate adaptation and infrastructure resiliency policies (as physical climate risks intensify in their key markets)
- Public investments to scale clean energy technology (to enable the low carbon economy transition)
- Social and financial stability legislation (to support a just and orderly transition)

Measuring and Managing Progress

As part of the optimization process, many banks have developed a variety of scorecards to measure and manage borrower progress. A great example of this is Citi's Climate Risk Assessment & Scorecard (CRAS). To help understand the climate risk profiles of its individual corporate clients in high-emitting sectors, Citi created the CRAS tool for use with certain emissions-intensive borrowers. A summary of its components is included below in the table below.

Figure 3. Citi's Climate Risk Scorecard. Credit. Citi 2022 TCFD report.

Emissions Data	Scope 1-3 absolute emissions and emissions intensity data, including industry averages as applicable
Scenario-Based Inputs	Climate scenario-based inputs and emissions performance comparisons relative to industry
Transition Risk Drivers	Client's vulnerability to applicable transition risk drivers, including legal and regulatory risks and financial capacity
Physical Risk Drivers	Vulnerability to physical risk drivers both acute and chronic
Transition Risk Mitigants	Decarbonization targets, net zero commitments and transition plans
Capital Expenditures	Capital expenditures allocated to transition
Government Support	Available grants, subsidies and regulatory mechanisms to support transition
Physical Risk Mitigants	Client's adaptation measures for physical risk impacts
Governance	Senior-level climate-related oversight and ties to remuneration
Transparency	Disclosures aligned with TCFD or other recognized frameworks
Output	**Overall climate score with individual scores for: Vulnerability; Management Mitigation & Adaptation; and Governance & Transparency**

We recommend that banks use a comparable tool to measure their borrowers' decarbonization progress.

Also, as mentioned earlier, the bank's internal return (profitability) models will need to keep pace with enhancement efforts to ensure that the bank can measure, monitor, and reward successful execution of the bank's climate strategies.

One such model improvement that we recommend is the development of additional metrics that embed climate into business decision-making. One example of this is a return on carbon metric. At its most basic, return on carbon is calculated by dividing the return a bank would earn from a client portfolio by the amount of scope 3, category 15 financed emissions associated with that portfolio. The goal is to provide insight into how much revenue a bank generates from the borrower per unit of GHGs emitted by that borrower. Like other return metrics a bank uses, higher return on carbon values are more desirable (they would indicate a borrower business model that relies less on emissions) and lower return on carbon values would be less desirable (all else being equal, this would indicate a legacy business model, heavily reliant on high-emitting assets).

Such an enhanced return metric is also useful to incentivize behavior change by the first line of defense. For example, return on carbon usage would favor approval of climate solution financings, as well as borrowers with credible and successful transition plans that are already producing results.

- **Example:** Assume two independent electric power producers (company A and company B) have both submitted requests for a $100 million capex facility. Company A and B have both agreed to pay the bank $500,000 in upfront fees, both agree to the same lending spreads and covenants, and both are rated A- by recognized credit rating agencies. However, Company A has also published a credible transition plan, which has been partially implemented, resulting in 25% renewable power generation. Company B has not published a transition plan and relies on 100% fossil fuel.

- If a bank is relying solely on profitability, return on equity (ROE) and return on risk adjusted capital (RAROC) to evaluate borrowers, it may find it difficult to choose between Company A or B. However, if the bank also adds return on carbon to its decision matrix, the return on carbon for Company A will be superior to Company B, providing the bank with decision-useful insights in pursuit of transition risk-adjusted commercial opportunities.

Adoption of these kinds of metrics is also useful for enhancing a bank's second line of defense portfolio management processes in two main ways.

First, new metrics can be used as part of a pricing maximization approach. Here borrower fee revenue is adjusted (and emissions are held static) to allow a bank to determine how much relationship pricing needs to change for it to meet the bank's target return thresholds (especially relevant in light of the Fed's proposed higher bank capital rules). In this approach, advocated for by some academics, NGOs, and think tanks, high-emitting firms would attract higher risk premiums.

The second is the more familiar capital optimization approach. Here the bank would prioritize providing capital to borrowers with the lowest amount of transition risk. Practically speaking, this approach would result in borrowers with the most credible (successful) transition plans being able to access the most capital at the best pricing, relative to high-emitting borrowers in the same industry.

Of course, banks use many other models to support risk management and commercial origination efforts, all of which would benefit from updating to incorporate climate-related financial risks alongside the development of new metrics. After all, as best as possible, these models are meant to reflect real- world conditions. And the real world is quickly transitioning to a low-carbon economy.

Conclusion

Five years ago, a global tipping point was reached in the energy transition. In 2018, for every one dollar invested in fossil fuels, the same amount was invested in clean energy. Fast forward to today, and significant progress towards decarbonization has already started. Now, for every dollar invested in fossil fuels, $1.70 is invested in clean energy. The tipping point to a low carbon economy has been tipped.

Today, global banks, investors, and governments worldwide are deploying increasing amounts of capital towards climate solutions, implementing sustainability regulations, and passing landmark climate legislation—all in support of restructuring the global economy to be resilient as we transition to a low-carbon future.

Whether financial institutions choose to be a leader or a laggard or consider climate change a current or emerging risk is largely irrelevant. The era of business-as-usual client engagement, product development, and risk management is over. For the benefit of their stakeholders, banks and credit unions need to work their way up the low-carbon economy transition opportunity ladder and take advantage of the massive commercial opportunities highlighted in this guide.