OakNorth
CREDIT INTELLIGENCE

THE ULTIMATE GUIDE

Commercial Lending & Climate Impact

Get Ready to Address the Financial Impacts and Regulatory Requirements for Climate Risk

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Facing the regulatory challenge

The SEC throws down the gauntlet

The U.S. Securities and Exchange Commission (SEC) has proposed rule amendments that would require a domestic or foreign registrant to include climate-related information in its registration statements and periodic reports, such as on Form 10-K.

This includes:

- Climate-related risks and their actual or likely material impacts on the registrant's business, strategy, and outlook.
- The registrant's governance of climate-related risks and relevant risk management processes.
- The registrant's greenhouse gas (GHG) emissions, which, for accelerated and large accelerated filers and with respect to certain emissions, would be subject to assurance.
- Certain climate-related financial statement metrics and related disclosures in a note to its audited financial statements.
- Information about climate-related targets and goals, and transition plan, if any.

Read the SEC's detailed statement **here**.

Banks are facing both investor and regulatory pressures to implement new, wide-reaching processes and systems to support a robust climate change assessment framework. These changes stretch across the entire loan book, from scenario analysis risk management to lending opportunities.

As Blackrock CEO, Larry Fink, wrote in his 2022 letter to shareholders: "The tectonic shift towards sustainable investing is still accelerating. Whether it is capital being deployed into new ventures focused on energy innovation, or capital transferring from traditional indexes into more customized portfolios and products, we will see more money in motion."

This sentiment is being echoed by the regulators issuing principles for climate-related financial risk management. While these are currently limited to large banks, examiners have cautioned midsize and community banks to "use the time wisely."

So, what does this mean for your bank? What processes do you need to put in place? What data points do you need to consider and how can you re-purpose the data you already have to analyze and mitigate climate risk, and identify new lending opportunities? And as Larry Fink put it, will you lead or be led when it comes to climate?

This Guide describes the challenges your bank is facing — particularly the investor and regulatory imperatives — and explains how the ON Climate solution can help you address these issues head on, using data driven insight to minimize risk and maximize opportunity.

Climate regulation for U.S. banks gains momentum & regulatory perspectives on climate risk continue to progress

ON Climate gives you the insights and tools you need to comply with the latest regulations.

DEC. 2021

The OCC

— On December 16th, 2021, the OCC published draft principles for climate-related financial risk management for banks with over $100 billion in total assets.

— It invited feedback from the industry on these principles and is currently consulting on this feedback to inform more formal guidance.

MARCH 2022

The SEC

— On March 21st, 2022, the SEC announced proposed rule changes on climate-related disclosures to address investor concerns around the lack of consistency, comparability, and reliability of climate-related disclosures.

MARCH 2022

The FDIC

— On March 30th, 2022, the FDIC published draft principles for managing exposures to climate-related financial risks.

— The Climate Principles are generally targeted at banks with over $100 billion in total assets that are regulated by the FDIC.

SEPT 2022

NFGS

— On September 6th, the Network of Central Banks and Supervisors for Greening the Financial System (NGFS) published an updated set of climate scenarios that, for the first time, consider the impact of potential losses from extreme weather events and chronic climate changes on the macroeconomy.

— When it comes to the selection of climate scenarios, there appears to be a clear preference towards the NGFS Climate Scenarios, which are being used by many banks as a starting point given broad regulatory acceptance (the FDIC, the Fed, and the OCC are all members of NGFS).

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SEPT 2022

The OCC

— On September 12th, Acting Comptroller of the Currency, Michael J. Hsu, announced the appointment of Dr Yue (Nina) Chen as the OCC's new Chief Climate Risk Officer, who will lead the agency's climate risk efforts related to supervision, policy, and external engagement. Reporting directly to Hsu, this role reflects the increasing importance regulators are placing on climate related financial risk management.

OCT 2022

FDIC

— On October 3rd, Acting Chairman of the FDIC, Martin J. Gruenberg, gave a speech at the American Bankers Association Annual Convention, focusing on the financial risks of climate change, and making it clear that the FDIC now expects community and mid-size banks to develop climate-related financial risk management practices.

JAN 2023

The Fed

— On January 2023, the Board of Governors of the Federal Reserve System launched its pilot climate scenario analysis (CSA) exercise, which will see six US banks submit data templates, supporting documentation, and responses to qualitative questions to the Federal Reserve by July 31st.

— The overall aim of this is to gather information surrounding the climate risk management practices of some of the largest banks, in addition to improving the abilities of US lenders to identify, measure, monitor, and manage climate risk.

JAN 2023

The SEC

— In Spring 2023, The SEC is expected to take final action on its proposed new climate-related disclosure rule, according to the Fall 2022 Unified Agenda of Regulatory and Deregulatory Actions released by the Office of Management and Budget's Office of Information and Regulatory Affairs in January 2023 (the "Agenda").

CALCULATE YOUR CLIMATE PREPAREDNESS SCORE

How many of these issues do you recognize? Check all that apply.

- ◯ Do you rely on historical data that are unable to provide granular insights for the future?
- ◯ Do you have information overload, but still not enough actionable intelligence?
- ◯ Are your systems outdated and do data become outdated the moment received?
- ◯ Are you able to report the carbon emissions of your commercial loan book?
- ◯ Do you have multiple data sets coming from different systems?
- ◯ Do you believe that historical data do not tell the future and you require a forward-looking view to make better decisions?
- ◯ Is it hard to stay on top of changing regulatory advice and requirements with regards to climate change?
- ◯ Do you want to understand the potential impact of climate change on your loan book so that you can make informed recommendations to your board?
- ◯ When you are presenting climate impact to the board, can you clearly articulate the rationale behind your recommendations to win their confidence and trust?
- ◯ Can you identify and invest in decarbonizing ventures to lower the emissions you finance?
- ◯ Can you comply with climate policy, increase green lending, and improve brand value?
- ◯ Can you produce an up-to-date risk model that allows you to either de-risk or grow?
- ◯ Do you have consistent, comparable, reliable, and decision-useful information?
- ◯ Is your frontline team climate confident and are your relationship managers equipped to discuss climate change with borrowers?

COUNT YOUR 'YES'

9-14

Bravo! You are aware of the current gaps that data and legacy systems have and understand the risk that climate change poses to your loan book.

6-9

Shout out to you! You recognize the problem of information overload but not enough actionable intelligence. You are aspirational in your climate risk readiness, and you are on the right path to countering climate impact to your loan book.

<6

We hear you! We are here for you. Climate change is an undeniable threat – but also possibly your greatest opportunity. Get ready to embrace the challenge and equip yourselves for decades of potential growth.

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Risk and advantage

> "Banks with strong climate risk management systems and capabilities will not only be better prepared to withstand climate change events but will also have a better line of sight into the many business opportunities that will arise."
>
> **MICHAEL HSU, ACTING COMPTROLLER OF THE CURRENCY AT THE OCC**

In 2022, there were 18 extreme weather events across the US – each causing $1B or more in damage. The next billion-dollar climate catastrophe is, unfortunately, just around the corner. The direct impact of climate change and the policies put in place to address it will have long-term consequences for your commercial lending portfolio. It could wipe out loan books and reshape huge sections of the economy.

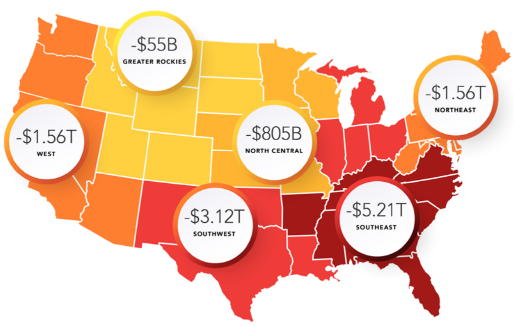
Without doubt, it is one of the most wide-reaching threats that will ultimately affect every borrower in your bank's loan book. The challenge is that most banks simply don't have the tools needed to measure the impact, or even a clear view of where to get started. The methods and operating practices of the past are no longer fit for purpose as climate impact requires a forward-looking analysis. You need to reshape the way you assess risk, analyze your loan book, and identify growth opportunities.

But change on this scale is very challenging - it's a new era of risk assessment, one that requires new tools and access to the right data to make informed decisions.

The Climate Cost

$900B ANNUALLY — DECREASE IN GDP OVER NEXT 50 YEARS

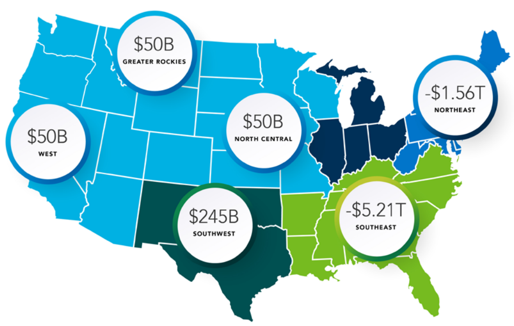
$14.5T BY 2070 — NPV LOSS IN GDP



The Climate Opportunity

$885B ANNUALLY — INCREASE IN GDP OVER NEXT 50 YEARS

$3.1T BY 2070 — INCREASE IN GDP IN PRESENT VALUE



The cost of inaction is high, but the opportunity for action is immense. While you may be exposed to climate risk and industries in structural decline, you don't have to miss out on the innovative industries or opportunities within your loan book.

Source: The Turning Point: A New Economic Climate in the United States, Deloitte Jan 2022

ON Climate

Building a cloud-based climate SaaS solution

ON Climate is a SaaS application that was developed by our team of credit scientists and software engineers, in close collaboration with 10 US banks and 27 climate experts. ON Climate enables your teams to make faster and smarter decisions on which borrowers or industries in their portfolio are most likely to suffer or benefit from climate change, and as a result, mitigate risk and identify origination opportunities to lend more.

Risk & monitoring teams

Run climate impact scenarios, identify impacted portfolio and climate impact metrics to track, and prepare for regulatory discussions.

Decrease risk exposure and effects in sectors with inherently high climate risks.

C-Suite

Understand how climate transition risk might impact your commercial lending portfolio, sector level risk trends, mitigants, and policy adoption.

See an overview of your climate risk and distributed exposure across top sectors and borrowers.

ESG and sustainability teams

Manage GHG reporting by calculating, and tracking, financed GHG (greenhouse gas) emissions.

Climate scenarios

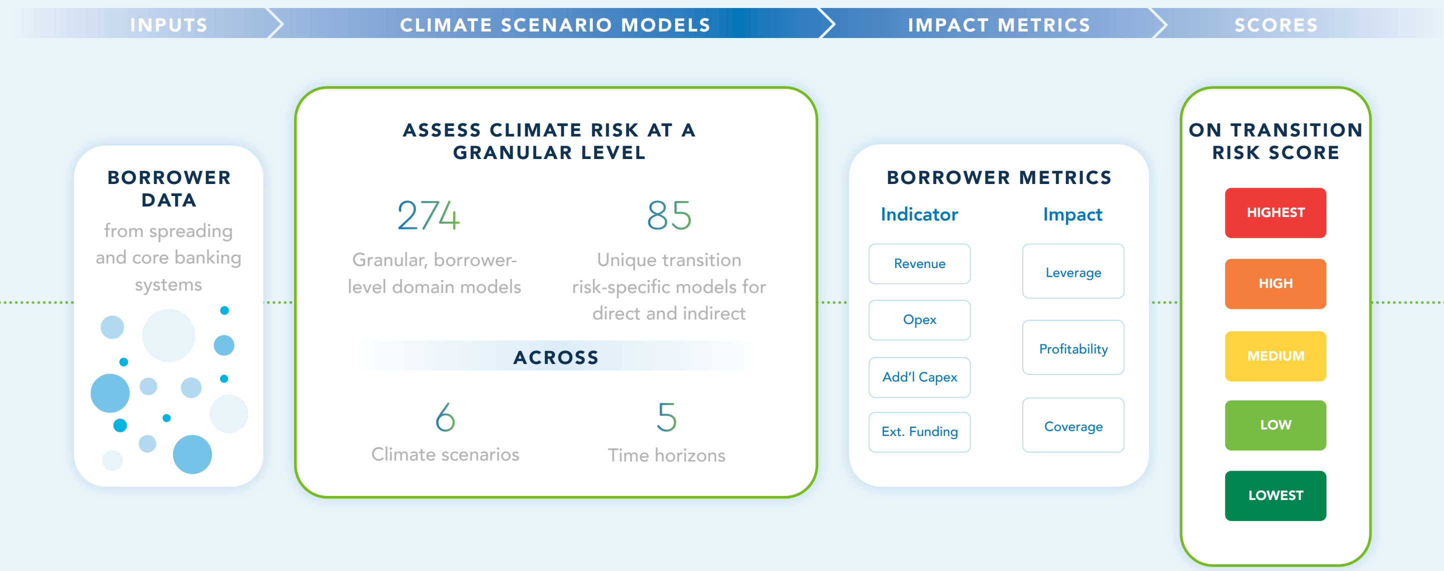
ON Climate applies six scenarios that are aligned with the Network for Greening the Financial System's (NGFS) climate scenarios, and the Paris Accord, and the May'21 US Executive Order. These scenarios are evaluated across five time horizons i.e. 2024, 2025, 2030, 2040, and 2050. ON Climate also enables banks to run the Federal Reserve's Climate Scenario Analysis (CSA) for Net Zero 2050 and Current Policies climate scenarios based on the NGFS 2022 release for transition risk.

6 NGFS CLIMATE SCENARIOS	NET ZERO 2050	BELOW 2°C	DIVERGENT NET ZERO	DELAYED TRANSITION	NATIONALLY DETERMINED CONTRIBUTION	CURRENT POLICIES
	1.5°C rise in temperature by 2050	1.7°C rise in temperature by 2050	1.5°C rise in temperature by 2050	1.8°C rise in temperature by 2050	2.5°C rise in temperature by 2050	>3°C >3°C rise in temperature by 2050

5 TIME HORIZONS					
	2024	2025	2030	2040	2050

ON Climate applies the scenarios to our repository of 274 industry, covering 963 6-digit NAICS codes, to assess carbon emission impact from policy actions and supply chain disruption at a very granular industry level.

In addition, ON Climate provides forecast financials and credit metrics at the borrower level – under each of the climate scenarios and time horizons. These outputs can be directly inputted into to banks' existing risk rating models to drive a climate-adjusted risk rating.



Borrower data

Banks can easily run robust and dynamic analysis to determine climate impact and emissions using existing borrower datasets. ON Climate overlays six climate scenarios on 14+ borrower data points, that can be readily extracted from your spreading and core banking systems, to provide a forward-looking climate transition risk score from low priority (least vulnerable) to high (most vulnerable).

Climate risk

ON Climate covers transition risk assessment at the granular industry level. In the future, the solution will be extended to encompass the physical risks of climate change as well.

Transition risk

To arrive at the ON Transition Risk Score, the ON Climate solution identifies the borrower level impact metrics that influence the revenue (driven by shift in demand or disrupted operations) and costs (supply-chain driven operating costs, capital expenditure for clean or remediating technology) along with policy driven impact for borrowers and uses those to project the future financial health and potential risks their business may face.

Physical risk

ON Climate's physical risk assessment will evaluate how extreme weather events such as floods, drought, and hurricanes can lead to business disruption and damage to property. It will also address how longterm changes in climatic patterns, such as rising temperatures, change in precipitation, increasing sea levels, desertification, etc. can affect labor, capital, and agricultural productivity.

ON Transition Risk Score

ON Climate provides you with an overview of your climate transition risk and distributed exposure across top sectors and borrowers for your commercial portfolio.

Filtered lists of specific borrowers. For example those with:

- Lower projected climate transition risk, in sectors that are rated to have inherently high climate risk.
- Borrowers with high climate transition risk that you might be able to coach to help avoid future risk.

Financed emissions reporting

ON Climate helps banks calculate and report on Scope 3 financed emissions across their commercial loan portfolio. The solution follows the Partnership for Carbon Accounting Financials (PCAF) guidelines when calculating GHG emissions and applies the PCAF's Score 3 and Score 4 methodology. This allows banks to view the total financed emissions in loan book by portfolio and individual borrower level.

Financed emissions

ON Climate provides you with the total financed emissions for your commercial loan portfolio split by:

- Total scope 3 financed emissions
- Financed emissions (Scope 1 and Scope 2) by sector
- Financed emissions (Scope 1 and Scope 2) for each borrower

Taking a holistic view of financed emissions—together with carbon pathways under the various NGFS scenarios—enables banks to evaluate and set overall emission goals (e.g. net zero by 2050), and understand the levers available to manage a transition of their commercial portfolio.

FIFTH THIRD BANK

Quantifying climate risk at Fifth Third Bank

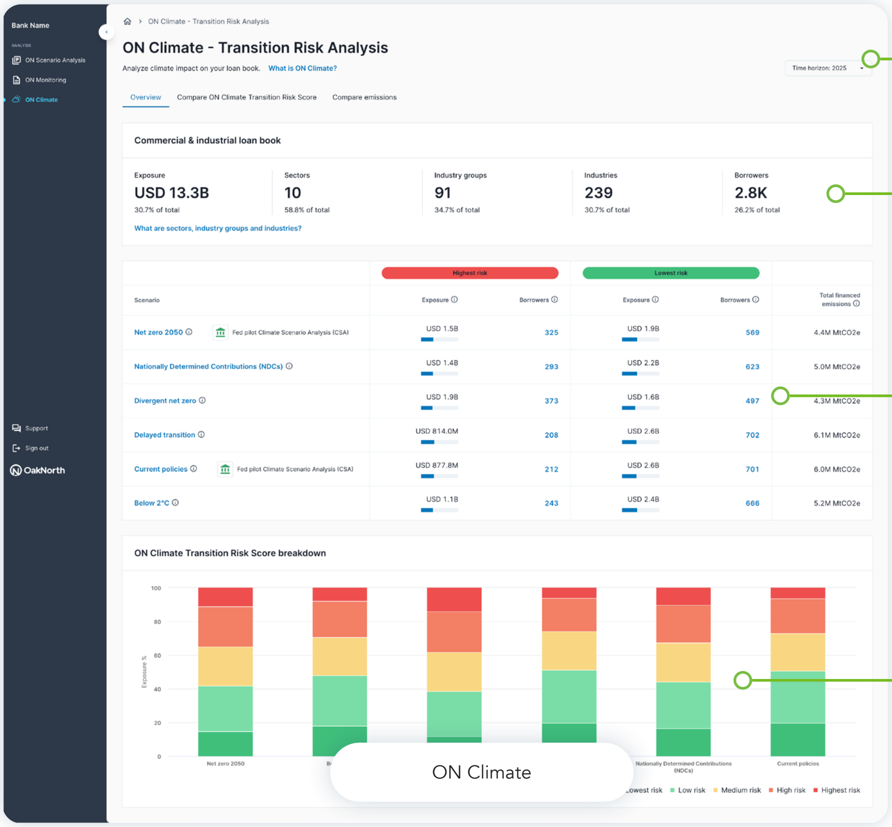
Fifth Third is the 13th largest bank in the US, with over $206B in assets, of which roughly 25% is commercial loans.

OakNorth Credit Intelligence is excited to partner with Fifth Third to help deliver climate scenario analysis, identify areas of climate transition risk and opportunity, and guide future conversations with borrowers.

> "[Fifth Third] is actively integrating climate risk into our Risk Management Framework and planning for scenarios that reflect climate change.
>
> This will, in turn, allow us to establish conversation points to guide our lines of business in discussions with our customers, and enable the Bank to develop a net-zero aligned strategy not only to manage risk but also to continue transparency around the Bank's emissions across our portfolios"

GREG D. CARMICHAEL
CHAIRMAN & CEO AT FIFTH THIRD BANK

ON Climate



Adjust timelines to understand climate impact on your portfolio in the short term, delivering immediate ROI, as well as seeing the long term outlook for your portfolio.

View your total C&I book by exposure across sectors, industries and borrowers.

As well as meeting the need to view climate transition risk across the six NGFS scenarios, you can also calculate and report on financed emissions - and discover new green lending opportunities.

Compare ON Climate Transition Risk Score in your loan book across different scenarios.

Apply climate insights across your full credit lifecycle

ON Climate provides you with insights on climate transition risk in your commercial portfolio that can inform your approach to every stage of the credit lifecycle: from origination and ongoing monitoring, to conducting portfolio level scenario analysis, responding to investor, board, Federal Reserve's Climate Scenario Analysis (CSA) guidelines, and setting credit strategy.

Portfolio Management

— Assess climate transition risk for direct and indirect impact sectors through financed emissions and credit risk

— Report on financed emissions and credit risk

— Determine carbon price impact

Monitoring

MONITOR

— Use climate risk analysis to: Identify and take action on sectors and borrowers with greatest risk today

— Adjust approach to portfolios that will face increased risk in the future

REVIEW

— Run climate reviews on the sectors and borrowers that require immediate attention

Origination

FUTURE

— Avoid lending into sectors projected to have high climate transition risk without a transition plan

— Discover sectors and borrowers

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Implementing ON Climate

Any climate impact solution will require an investment, so the question is why opt for a third-party solution when you could potentially build it yourself? Also, it is essential that the solution uses agreed, recognized accounting standards and a reliable, extensive, and broad data set to run scenario modeling.

Use of high fidelity data

Many years of research, product development, and billions of data points have gone into building ON Climate. ONci has one of the largest commercial lending data sets in the US, representing $420B of lending data across C&I such as automotive; agriculture, energy, industrial, manufacturing, building, and construction. Our modeling complies with the standards set by both NGFS and PCAF, and we use the NAICS for sector analysis. ON forward-looking scenarios are constantly updated with the most recently available data, including high frequency third party data sets, to ensure that scenarios are providing institutions with the most accurate view of climate impact, at any point in time, across all industries in their loan portfolios.

With ONci you can mitigate climate risk by quickly identifying sectors that have greatest climate transition risk and create effective transition risk strategies – averting future losses. Taking a conservative approach, we can generate millions of dollars of annual benefit to your bank through reduced loan loss provisions and, in the near future, through the identification of additional lending opportunities with new and existing borrowers.

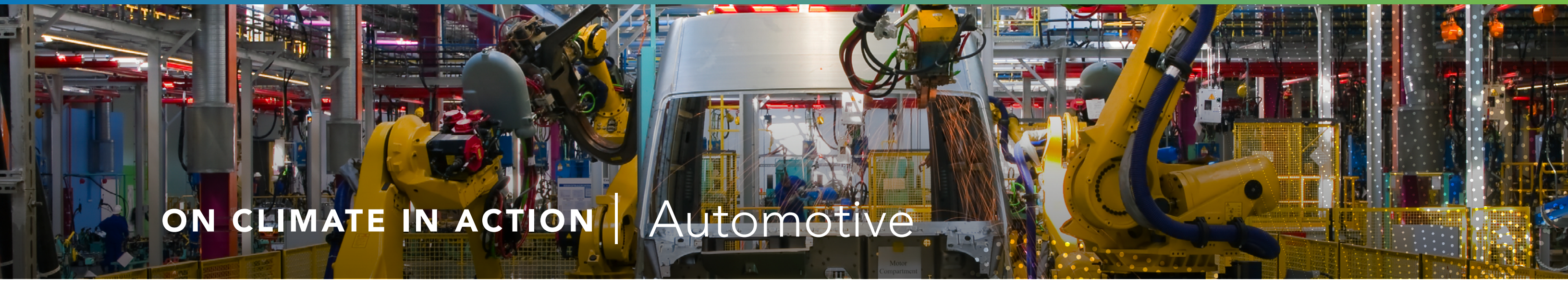
> “Having a second look with ONci’s software and process has been invaluable to us – both internally as we communicate with our board, and externally as we communicate with our investors and the regulators.”
>
> **MIKE LYONS**
> **EXECUTIVE VICE PRESIDENT AND HEAD OF CORPORATE & INSTITUTIONAL BANKING AT PNC**

$420B

ONci has one of the largest commercial lending data sets, representing $420B of lending data across a multitude of industries

Quick ON-boarding and next steps

You could implement ON Climate in under three weeks, moving rapidly from initial briefing through exploratory workshops, an executive readout, and then go live. To discover what it could deliver for your bank, we offer a rapid onboarding that is completely customizable to your needs.



ON CLIMATE IN ACTION | Automotive

ON Climate goes into much greater detail to uncover hidden truth and reveals areas of risk and advantage, and how they may change over time.

The auto sector is undergoing dramatic transformation as we move towards electric vehicles (EV). The pace of this technological disruption is astounding and will impact the entire value chain affecting both upstream and downstream sectors. Banks need a borrower-level understanding of how risk cascades down the value chain.

HIGH LEVEL

RAW MATERIALS · PARTS MANUFACTURERS · OEMS · AUTO SALES & SERVICE · END MARKET · SCRAPYARDS

GRANULAR LEVEL

L1 TO L5 NAICS

We dig down five levels, to NAICS 6-digit industry code to uncover crucial details buried within your data, providing you the information needed to report, recommend, and act with confidence.

TRUCK TRAILER MANUFACTURING

EMISSION INTENSITY

$\sum_{C} \frac{\text{SECTOR EMISSION}}{\text{SECTOR REVENUE}}$

PCAF

2025 2030 2040 2050

Emissions intensity for the industry is calculated by dividing the aggregated amount of carbon emissions for the industry with the total industry revenue. The data used are from:
US census data I EPA/market data I USGS I CDP I Census inventory I Borrower sustainability reports and other disclosures.

SUPPLY CHAIN IMPACT
Raw material cost pass on
Steel · Plastics · Rubber · Aluminum

POLICY ACTION
Carbon tax

MITIGATION/CAPEX INVESTMENT
Green Hydrogen replacing fossil fuel usage
Transition to EV % Fleet Transitioning to EV

Emissions intensity along with NGFS intensity reduction target are used to identify the financial impact drivers needed to reach the target and weightage of each driver. Some drivers (like Policy action) are derived from NGFS, while others are a discovered through extensive sector research by ON.

REVENUE CHANGE
2025 2030 2040 2050

EBITDA MARGIN %
Expected recovery
2020 2025 2030 2040 2050
DSCR + Leverage also considered

The impact drivers and the climate scenarios are overlaid on 14 borrower data points to identify borrower level impact metrics that influence revenue, debt service coverage, leverage and profitability, and provides forecast financials and credit metrics for the borrowers, thus assigning them a transition risk score.

LOWEST · LOW · MEDIUM · HIGH · HIGHEST

ON Transition Risk Score can be compared with bank's existing risk rating models to derive a climate adjusted risk rating.

EMISSION INTENSITY » **FINANCED CARBON EMISSIONS**
Total Scope 3 financed emissions for bank
Financed emissions (Scope 1 and Scope 2) by sector
Financed emissions (Scope 1 and Scope 2) for each borrower

The emissions intensity is also used to identify carbon emissions for borrowers following PCAF's score 3 and score 4 methodology.

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CLIMATE CONSORTIUM

Set the standard

Leading the industry in commercial credit analysis

The ON Climate Consortium is a group of innovative, climate-forward institutions driving commercial lending approach to climate risk and opportunity. Participants include 60 industry leaders from 30 commercial banks, representing $14 trillion in combined assets - an incredibly strong representation of the US banking community.

ONci's experienced team of credit analysts and data science experts continue to evolve and refine our tools, models, data sets, and climate analysis, and work closely with leading US banks, such as PNC, M&T Bank, and Fifth Third to make sure our solutions meet lender's needs.

30
Participating commercial banks

$14T
in combined assets

PARTICIPANTS

AMALGAMATED BANK
ASSOCIATED BANK
AVIDIA BANK
BANK OF AMERICA
BMO
BOK FINANCIAL
BUSEY
CADENCE BANK
CAPITAL ONE
CELTIC BANK
CIBC
CITIZENS BANK
CITY NATIONAL BANK
FIFTH THIRD BANK
FNBO
FORBRIGHT
FROST
HUNTINGTON
JPMORGAN CHASE & CO.
KEYBANK
M&T
OAKNORTH BANK
PACIFIC PREMIER BANK
PACIFIC WESTERN BANK
OLD NATIONAL
PNC
REGIONS
SMBC
SOUTH STATE BANK
UNITED BANK
VALLEY

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OUR TEAM

Lord Adair Turner
Chair of Energy Transitions Commission, ex-Chair of UK Financial Services Authority

Lance Uggla
Chairman & CEO of IHS Markit

Jing Zhang
Climate Advisor, Managing Principal at Apricus Climate Ventures, Formerly Head of Research and Modeling at Moody's Analytics

Jeremiah Norton
Former Deputy Assistant Secretary at the US Treasury

Bruce Richards
Former Head of Supervision for Complex Financial Institutions at Federal Reserve Bank of NY

Mark Levonian
Former Senior Deputy Comptroller for Economics at the OCC

OakNorth Bank

SUCCESS STORY

ON Climate at OakNorth Bank

> “We have built our reputation on being a trusted partner to the businesses we lend to. In order to continue being a trusted partner, we need to help them understand where their climate vulnerabilities are and what they can do about it. The ON Climate solution is helping us do that.”
>
> **NEIL EVANS, HEAD OF CREDIT RISK AT OAKNORTH BANK**

Challenges and objectives for OakNorth Bank

OakNorth Bank wanted to understand the most material climate-specific risks to its borrowers and evaluate the possible impact this could have on credit risk in its loan book. It also wanted to be able to report on its findings and start to identify new opportunities to support decarbonization in the economy.

How deploying ON Climate helped

In 2021, OakNorth Bank leveraged the ON Climate solution to conduct a granular-level scenario analysis that helped it determine the possible impact of climate transition risks in its loan book. Forward-looking scenarios were overlaid on borrowers’ current performance/base case forecasts to generate a forecasted performance for each borrower, which considers constantly evolving impact metrics, like carbon tax, over the short term (2025) to target policy year (2050).

OakNorth Bank concluded that while climate transition risk will have an impact on a number of its borrowers, only 0.15% of its total book would be directly impacted under the transitional risk assessment, and they can survive across the various scenarios with minimal impact compared to base case.

The analysis and conclusions were detailed in OakNorth Bank’s ICAAP submission and the ESG report within its 2021 Annual Results and received very positive feedback from various stakeholders, who said it was one of the most detailed climate change analyses they had seen from a bank to date.

Future plans

Based on the findings from the analysis, OakNorth Bank will continue to assess impact from transition risk scenarios derived from the ON Climate solution across all its borrowers, including those with minimal/residual impact. It will continue to expand on this analysis, integrating it alongside its full stress-testing framework and building out further stress scenarios including coverage of lower risk segments.

Having identified its risk and determined where it wants to play for opportunity, it is now standing up an origination team dedicated to sourcing green businesses that may need funding support, as well as brown businesses which may need funding support to transition their business model.

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