ON INDUSTRIES: CONSTRUCTION
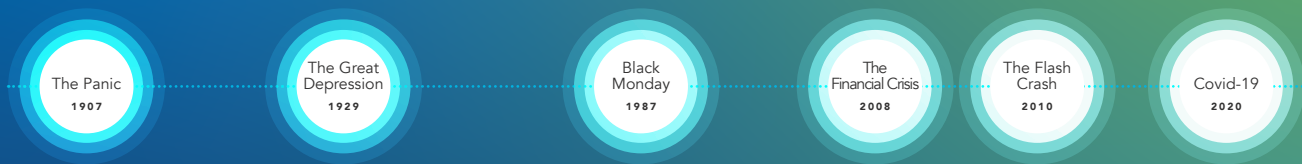
Industry insight with impact

ON Industries is a five-part series analyzing key industries through the lens of ON Credit Intelligence, providing commercial bankers with a detailed and powerful forward-looking view of the industry's drivers and performance.

ON Credit Intelligence
Safer lending in a volatile economy

PAST RECESSIONS – UNEXPECTED OUTCOMES

The Panic
1907

The Great
Depression
1929

Black
Monday
1987

The
Financial Crisis
2008

The Flash
Crash
2010

Covid-19
2020

FUELED BY ▶
- Geo-political tensions
- Financial innovations
- Fraud
- Leverage
- Climate catastrophe

LEADING TO A NEGATIVE IMPACT ON THE ECONOMY ▶
- Stock market crash
- Growth rate (GDP) falls
- Uemployment increases

NEW CHALLENGES ▶
- Knock-on effects of changing market trends, war, terrorist attacks
- Increase in interest rates and inflation
- Increase in oil and gas prices
- Geo-political risks
- Supply chain issues

History can give us reference data, but to analyze how the current market outlook might impact your loan book – you need a **forward-looking** and **granular view of risk** to assess your position and take corrective actions.

Table of contents
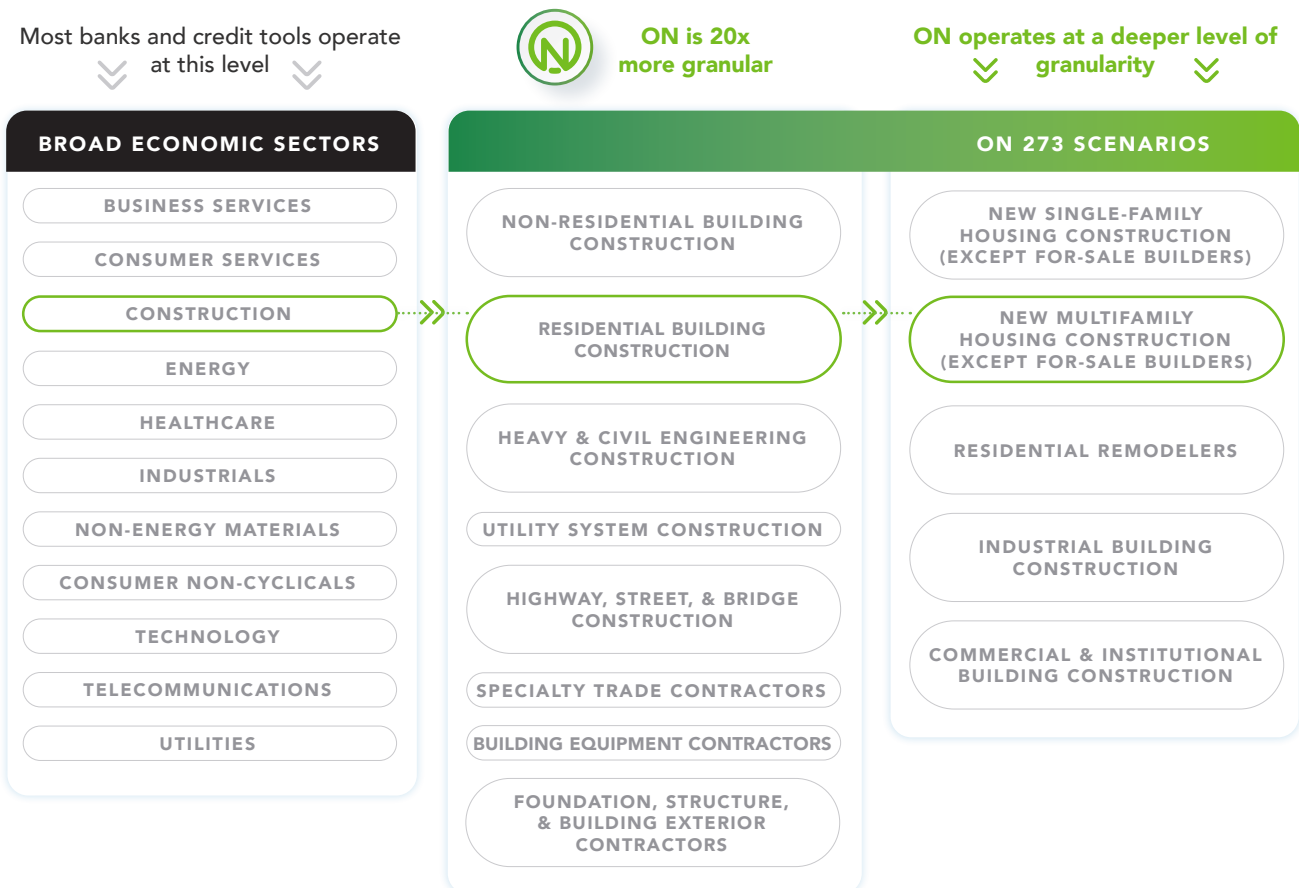
Borrowers are facing unprecedented risks

Soaring energy costs, rising interest rates, growing inflation, supply chains at breaking point, political instability across the globe, and the looming threat of climate change with wildfires and floods making headlines on a weekly basis. It's not a matter of *if* banks' borrowers will be impacted, it's knowing *when* and *how*.

That's why it's vital that banks are able to model various scenarios across their loan book to identify their greatest risks, as well as potential opportunities for growth. However, the traditional approach is too backward-looking, too used to benign market conditions (2009-2021 was the longest bull market in history), and no longer fit for purpose.

Commercial banks need to leverage scenarios that are granular, detailed, and forward-looking. This will enable them to look deep into each borrower's unique industry, asses every loan from the bottom up, select relevant macroeconomic factors which are fundamental to most banks and recommended by the regulators, and adjust them to conduct varying analyses to provide a forward-looking view of their entire loan book.

The traditional approach to analyzing a credit with the use of broader sectors often misses risks and opportunities that are only visible at the industry level. This has a significant impact on lending decisions and can lead to a misdiagnosis of borrowers' projected risk profile. As shown in the below example within the construction sector, the dynamics of the "new multifamily housing construction" industry differs significantly from "new single-family housing construction."

In this report, OakNorth dives deeper into the residential building construction industry and uncovers hidden insights needed to understand the impact and trends for borrowers in this industry.

Most banks and credit tools operate at this level ⌄ ⌄   **ON is 20x more granular**   **ON operates at a deeper level of granularity** ⌄ ⌄

BROAD ECONOMIC SECTORS		ON 273 SCENARIOS
BUSINESS SERVICES	NON-RESIDENTIAL BUILDING CONSTRUCTION	NEW SINGLE-FAMILY HOUSING CONSTRUCTION (EXCEPT FOR-SALE BUILDERS)
CONSUMER SERVICES		
CONSTRUCTION	RESIDENTIAL BUILDING CONSTRUCTION	NEW MULTIFAMILY HOUSING CONSTRUCTION (EXCEPT FOR-SALE BUILDERS)
ENERGY		
HEALTHCARE	HEAVY & CIVIL ENGINEERING CONSTRUCTION	RESIDENTIAL REMODELERS
INDUSTRIALS		
NON-ENERGY MATERIALS	UTILITY SYSTEM CONSTRUCTION	INDUSTRIAL BUILDING CONSTRUCTION
CONSUMER NON-CYCLICALS	HIGHWAY, STREET, & BRIDGE CONSTRUCTION	
TECHNOLOGY		COMMERCIAL & INSTITUTIONAL BUILDING CONSTRUCTION
TELECOMMUNICATIONS	SPECIALTY TRADE CONTRACTORS	
UTILITIES	BUILDING EQUIPMENT CONTRACTORS	
	FOUNDATION, STRUCTURE, & BUILDING EXTERIOR CONTRACTORS	

## Scenario structuring for projection of industry performance

The residential building construction industry is comprised of establishments primarily engaged in the construction of single-family homes and multifamily apartment housing. OakNorth's forecast on the operating and financial performance of homebuilders is based on the close monitoring of major drivers such as:

— Residential construction spending

— Housing starts

— Housing permits

— Mortgage rates

— New single-family home sales

— Median home sales price

Historical performance of single-family homes

Post pandemic, several factors impacted homebuilders in the US, with demand increasing compared to supply, resulting in significantly elevated home prices. The following analysis highlights insights into the sales-supply-price cycle for single family homes.

Single-family home sales
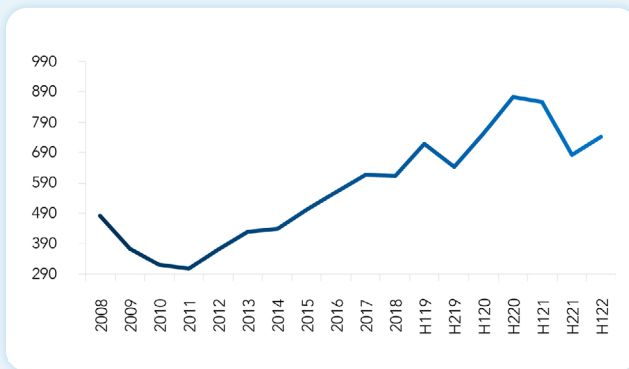
SALES-DRIVEN

The advent of COVID-19 marginally impacted the residential construction industry in terms of shutdown/growth momentum. Sizable growth in home sales volumes took place in FY20 and 1H21 due to higher-than-normal demand. This was driven by:

— Lower mortgage rates

— Desire for more space due to work-from-home constraints, resulting in higher demand for first move-up homes

— Increased participation from millennials who have reached the median age of first-time US homebuyers

Home sales started to taper from 2H21 onwards, driven by elevated home prices impacting affordability. A further spike in mortgage rates from 1Q22 onwards has also exacerbated the decline.

## Inventory for sale (monthly supply based on home sales)
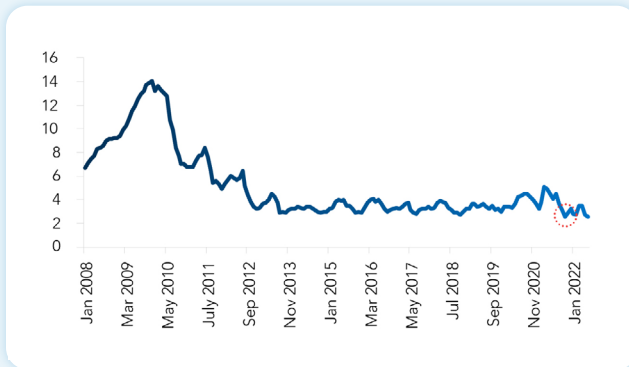
SUPPLY-DRIVEN

Post the financial crisis of '08, there was a slower pace of housing starts which led to a decade-long undersupply of houses in the market.

Supply chain disruption was witnessed in procurement of building materials such as lumber and steel, as well as semi-finished goods such as doors, framing and roofing parts, resulting in a delayed pace of completion of homes from FY21 onwards. Inventory available for sale fell to a record low level of 2.5 months in Oct-21 (highlighted in chart). While sales have started to taper, the demand-supply gap remains high, as reflected in available inventory at lower levels as of 2Q22.

## Home price
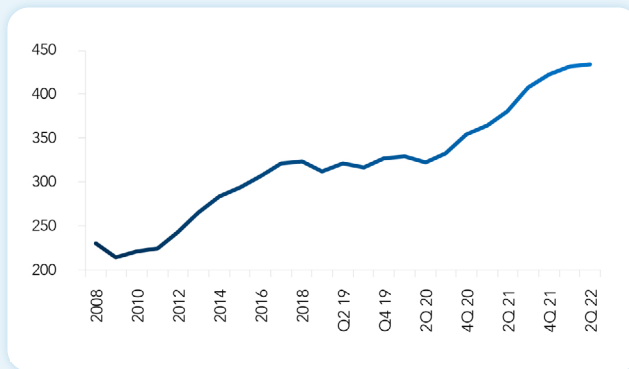
PRICE-DRIVEN

As a result of higher demand and limited inventory, new single family home prices grew by c.16% for FY21. This was also supported by raw material price inflation (lumber). Home prices continue to remain at elevated levels considering the demand-supply gap.

Efficacy of ON Forecasts

OakNorth's forward-looking scenarios have been put to the test over a series of industries with predictions assessed against actual outcomes. The accuracy of these forecasts is very high (90% accuracy achieved over the last 24 months for overall portfolio), giving banks confidence that the insights they receive offer a true indication of the future impact on their loan book.

OakNorth conducts quarterly reviews to assess the efficacy of its industry forecasts by comparing the reported revenues with the projected revenues using the most recent quarterly data available. During each update cycle, OakNorth also identifies critical emerging trends across industry groups and then makes the necessary revisions to its industry forecasts to minimize divergence.
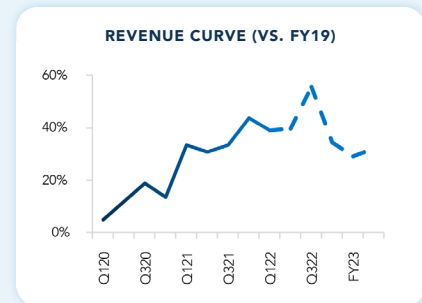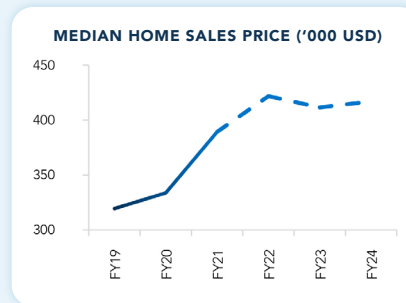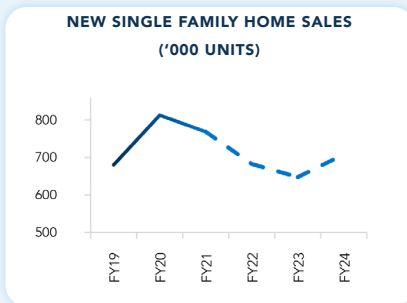
ON Industry Forecasts exhibit strong accuracy for the construction sector
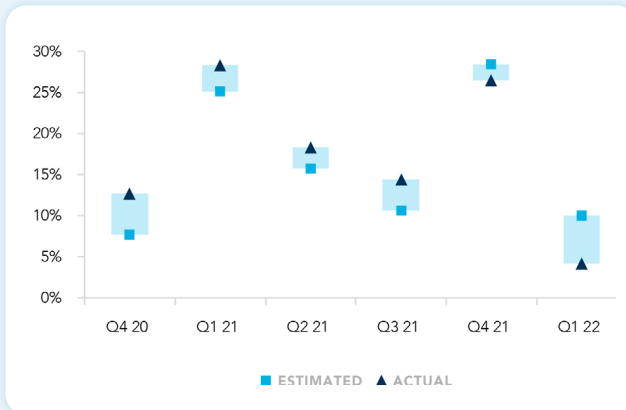
The accuracy of ON Industry Forecasts is measured by analyzing the amount of divergence between the actual performance of the industry growth rate and OakNorth estimates. As illustrated in the chart, OakNorth achieved low divergence[1] for past 6 quarters, at sub 6%.

[1] Low Divergence is defined as <=800bps differential between actual and estimated growth rates in a given quarter

Looking ahead - OakNorth's view on future performance

NEW SINGLE FAMILY HOME SALES ('000 UNITS)

MEDIAN HOME SALES PRICE ('000 USD)

REVENUE CURVE (VS. FY19)

- - - ON FORECAST

Revenue projection - Considering home prices, sales, and mortgage rates

OakNorth uses a KPI-driven model, hence KPIs such as single-family home sales and home sales price have been projected in order to forecast the revenue curve for borrowers in the single-family home construction industry.

— Home sales are expected to continue to decline over FY22 and FY23, impacted by a dip in affordability arising from elevated home prices and higher mortgage rates. Mortgage rates are expected to remain elevated, at above 5% for FY22 and FY23.

— Home prices are expected to moderate from 2Q22 onwards, and remain at muted levels in FY23, on account of erosion in home sales. However, home price correction is expected to be limited to single-digit levels. Overall completion of sold units is expected to be impacted in FY23, arising from slowdown in home sales in FY22.

— OakNorth expects revenue to dip post 3Q22 (considering lag effect) and remain under pressure over FY23. Post FY23, revenue is expected to grow with rise in home sales.

Profitability projection - Role of lumber pricing

Lumber is one of the key raw materials for single-family home construction. As per NAHB (National Association of Homebuilders), nine out of ten single-family homes have wood frames. Considering this, OakNorth has deep-dived into the price movement of lumber and its role in homebuilder profitability. The below charts show the price movement, PPI (residential construction), and EBITDA margin trend.

LUMBER PRICE

PRODUCER PRICE INDEX
(INPUTS TO RESIDENTIAL CONSTRUCTION)

EBITDA MARGIN TREND

— — — ON FORECAST
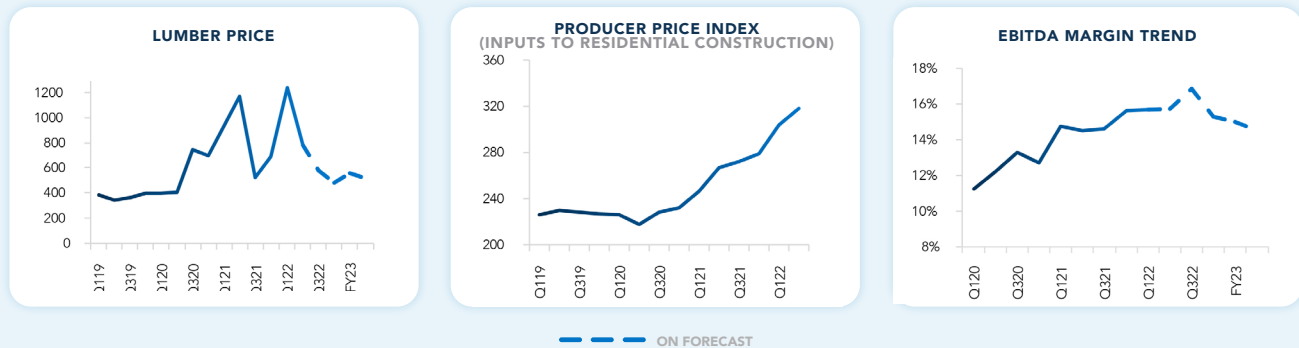
— Lumber prices grew sizably due to a mismatch in supply and demand. This mismatch arose from COVID disruptions impacting production, and higher residential demand. Wildfires in the west coast during FY21, further impacted timberland supply, which coupled with continued supply chain issues, resulted in higher prices which started tapering in 2H21. Towards the end of FY21, a doubling of import tariffs on Canadian lumber (~30% of consumption) resulted in an increase in prices in 1Q22. Prices have begun to taper from 2Q22 onwards and are expected to remain muted over the near term.

— Producer Price Index for inputs to residential construction, substantially escalated from late FY20 onwards, driven by raw material price inflation across commodities such as lumber and steel, amongst others, consequently supporting higher prices for newly built homes. While lumber prices have corrected, the producer price index continued to remain at elevated levels in 2Q22, due to higher pricing for semi-finished goods such as doors and a rise in overall labor costs.

— EBITDA margin in FY22 is expected to be supported by a dip in raw material prices such as lumber, and is expected to moderate from FY23 onwards, with a dip in revenue.

Impact of technological disruption on the building and construction sector

The building and construction sector is vulnerable to technological disruption, changing regulation, evolving consumer demands, etc. How would a bank's portfolio fare when faced with these challenges?

BUILDING INFORMATION MODELING (BIM): became an agreed term in the early 2000s and is now widely considered as one of the most significant technological advancements the industry has seen in decades for increasing efficiency and decreasing the cost of development. Architecture has traditionally worked in an iterative and manually intensive process, so how will BIM accelerate the completion of projects? And what will the impact be for those which are still using traditional, manual processes?

PREFABRICATED HOUSING: this market is expected to record a compound annual growth rate (CAGR) of 2% between 2018 – 2027 in the US, with the industry set to reach $153.7B globally by 2026 (*Source: Mordor Intelligence*). Key drivers behind this growth include reduced build times due to less materials being used, and rising demand from consumers for alternative and fundamentally, more sustainable approaches to residential construction. How will increasing demand for prefabricated housing impact the production of raw materials such as cement, sand, and I-beams, and how will these businesses fare? Could these businesses be supported with capital to pivot some of their production towards modular components such as precast panels and plywood? What about scaffolding companies which aren't needed for prefabricated housing? What about the costs to transport the larger prefabricated parts of the build? Or the specialist labor required to construct these units?

THE RISE OF GREENER, SMARTER AND MORE SUSTAINABLE HOMES has been dramatic in the US construction market. As per a recent report by GlobalData, the US' green building market was valued at $83.1B in 2021—a growth of 11% compared to 2020—with the market recording a CAGR of 8% between 2017 – 2021. The increased demand for more sustainable homes directly reduces the need for more traditionally constructed homes made from cement and steel, which could negatively impact suppliers' operating margins, as the volume of cement and steel consumption decreases. Cement and steel producers are therefore now looking at ways they can proactively engage with newer and more technologically focused companies, with the overall aim of developing new methods of using their product.

$83.1B
US GREEN BUILDING MARKET VALUE IN 2021

8%
CAGR BETWEEN 2017-2021

Climate as a scenario

Climate change is another scenario, which poses a huge risk to commercial banks and the businesses they lend to. As per a recent report from The National Oceanic and Atmospheric Administration (NOAA), there were 22 weather and climate disasters, which caused $1B or more in damages. Collectively, they caused over $145B in damages in the US in 2021, but there were hundreds more such events which caused several hundred million dollars in damages. Climate related costs are increasing, and the cost of inaction is high - $14.5 trillion in present value over the next 50 years.

While banks may be exposed to climate risk and industries in structural decline, they don't have to miss out on the innovative industries or opportunities within their loan book. The climate opportunity exists in entirely new industries such as clean energy, carbon capture, and investments into the transformation of existing industries with green technologies such as green manufacturing / construction and the electrification of vehicles.

The SEC and OCC have both raised the prospect of regulations that will compel banks to account for the likely material impact of climate-related risk on their portfolio, as well as the related greenhouse gas (GHG) emissions associated with lending. How equipped is your bank to evaluate the risks to your borrowers and identify new lending opportunities?

ON Climate: a solution for future lending

ON Climate—part of the wider ON Credit Intelligence Suite—provides powerful insights, powered by a granular forward look, that enable banks and financial institutions to get ahead of climate related risks and opportunities in a data-driven manner, enabling smarter, faster, and more proactive decisions across the credit life cycle. ON Climate provides:

— An overview of your climate risk and distributed exposure across top sectors and borrowers

— Total financed emissions by sector and borrower level (Scope 1 and Scope 2)

— A list of borrowers that should be prioritized for climate reviews

— Borrowers with high climate risk that you might be able to coach to help avoid future risk

— Borrowers with lower projected climate risk, even though they are in sectors that are rated to have inherently high climate risk

— Lending opportunities in sectors that are projected to have lower climate risk in the future

Granular analysis across the supply chain

THE CONSTRUCTION VALUE CHAIN

- RAW MATERIALS
- CONTRACTORS
- CONSTRUCTION
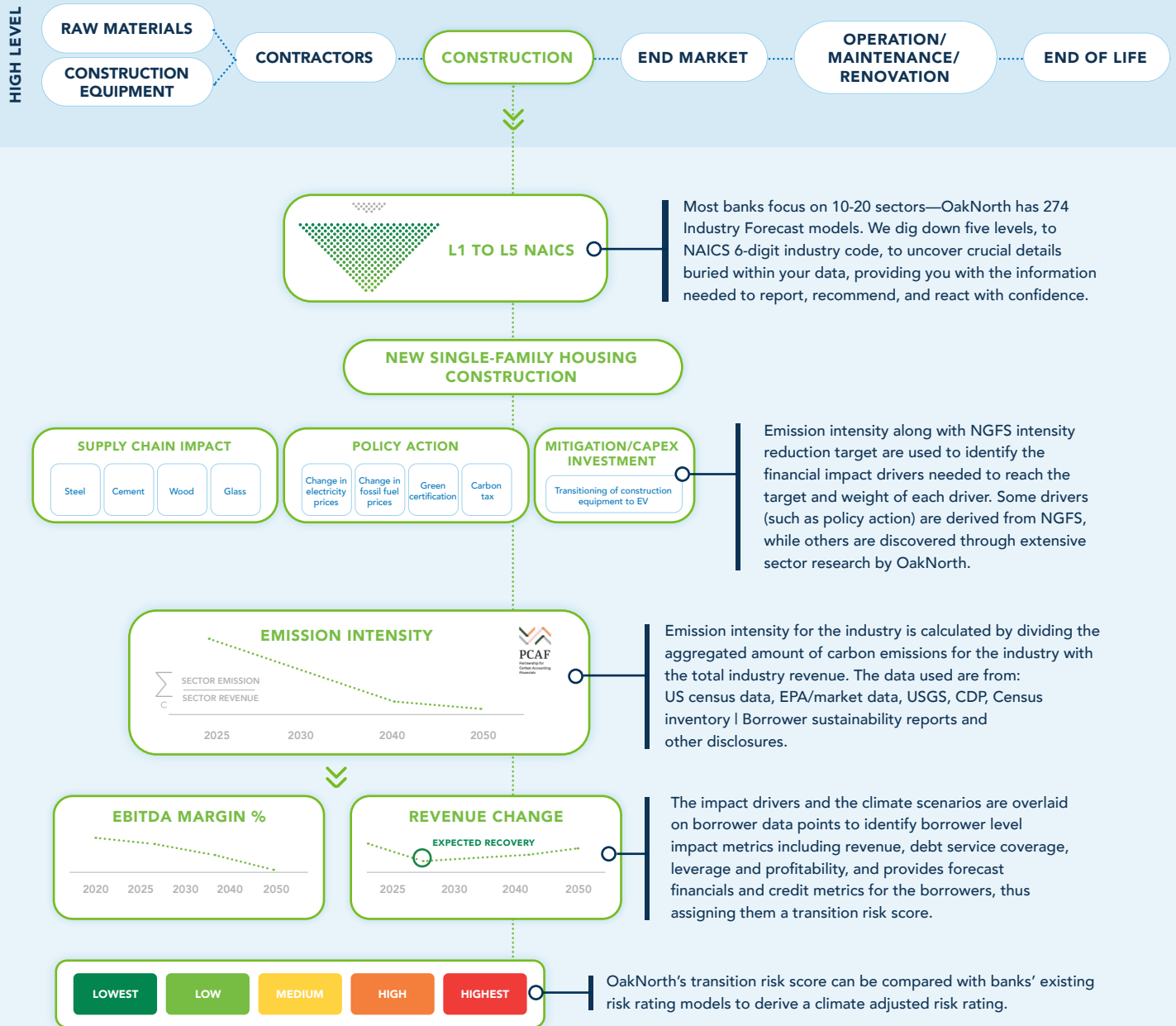- END MARKET
- OPERATION/MAINTENANCE/RENOVATION
- END OF LIFE

A look at OakNorth's granularity and how risk ratings are generated

This sample analysis of the potential impact of climate across the construction value chain reveals areas of risk and opportunity, and how they may change over time.

HIGH LEVEL

RAW MATERIALS
CONSTRUCTION EQUIPMENT
CONTRACTORS
CONSTRUCTION
END MARKET
OPERATION/ MAINTENANCE/ RENOVATION
END OF LIFE

L1 TO L5 NAICS

Most banks focus on 10-20 sectors—OakNorth has 274 Industry Forecast models. We dig down five levels, to NAICS 6-digit industry code, to uncover crucial details buried within your data, providing you with the information needed to report, recommend, and react with confidence.

NEW SINGLE-FAMILY HOUSING CONSTRUCTION

SUPPLY CHAIN IMPACT

Steel | Cement | Wood | Glass

POLICY ACTION

Change in electricity prices | Change in fossil fuel prices | Green certification | Carbon tax

MITIGATION/CAPEX INVESTMENT

Transitioning of construction equipment to EV

Emission intensity along with NGFS intensity reduction target are used to identify the financial impact drivers needed to reach the target and weight of each driver. Some drivers (such as policy action) are derived from NGFS, while others are discovered through extensive sector research by OakNorth.

EMISSION INTENSITY

PCAF
Partnership for
Carbon Accounting
Financials

$\sum_C \dfrac{\text{SECTOR EMISSION}}{\text{SECTOR REVENUE}}$

2025 | 2030 | 2040 | 2050

Emission 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, EPA/market data, USGS, CDP, Census inventory | Borrower sustainability reports and other disclosures.

EBITDA MARGIN %

2020 | 2025 | 2030 | 2040 | 2050

REVENUE CHANGE

EXPECTED RECOVERY

2025 | 2030 | 2040 | 2050

The impact drivers and the climate scenarios are overlaid on borrower data points to identify borrower level impact metrics including 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

OakNorth's transition risk score can be compared with banks' existing risk rating models to derive a climate adjusted risk rating.

Industry trend and the path to net-zero

In the above illustration, for the "new single-family housing construction" industry, OakNorth has identified several levers needed to reach the carbon reduction target. Since combustion of fossil fuels (diesel powered construction equipment) is the main source of GHG emissions for the industry, replacing diesel powered construction equipment with electric

equipment could be a sustainable solution for the sector. This would result in additional capital expense and operating cost saving (due to lower cost of operating electric equipment) for the industry.

As various industries across the supply chain move towards a low-carbon economy, the industry could face higher prices of key raw materials (such as steel, cement, glass and wood) in the future. Borrowers are likely to pass-on a significant portion of the incremental climate-related costs, given the industry's high importance for the economy. Overall, margins are likely to face significant contraction in the near-medium term (because of the higher raw material costs), before gradually moving towards normalcy in the longer run (as raw material cost headwinds subside in a low-carbon economy).

KICKOFF   **WORKSHOPS**   **EXECUTIVE BRIEFING**   **GO LIVE**

Let's put your loan book to the test

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

Schedule a demo to learn how the ON Credit Intelligence Suite can help your institution better evaluate and manage climate-related risks in your portfolio.

Request a demo