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## Unlocking Net Zero Opportunities in Lending

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## Introduction

### The emergence of Net Zero financing

The notion of market failure in the context of carbon dioxide emissions is not new. It is generally acknowledged that firms create negative externalities through unpriced costs to society by emitting carbon in running their operations. What is relatively more recent is the concerted intention to reduce carbon emissions globally, in the effort to contain the costs from damaging climate-related events such as wildfires, severe floods and sea level rise.

Initiatives from various segments of the global economy, such as the Paris Agreement [i], the Task Force for Climate-Related Disclosures [ii] and banking institutions themselves [iii] are aimed at reducing the net emissions of carbon dioxide and other greenhouse gases into the atmosphere to zero ('Net Zero'), with the ultimate goal of stabilising the rising trend in global temperature [iv].

To meet this overarching objective, some economic agents, including governments, firms and individuals, are exploring targeted action to bring about a structural shift in economic activity through changing production and consumption patterns. This is perhaps not dissimilar to regime-switching events such as the invention of steam trains and electricity. The role of the financial sector is particularly important as a key provider and facilitator of the financing required to achieve the admittedly ambitious goals.

Net Zero financing [v] is a relatively new concept that is already picking up momentum; however, by many accounts it needs to ramp up significantly to meet stated goals [vi] despite the numerous challenges around data (un)availability and policy uncertainty, among others. In this paper we introduce an approach to assess how much green lending is appropriate and manageable for each counterparty under various climate scenarios, based on their financial characteristics and level of carbon emissions. Leveraging suitable analytics, finance providers, such as banks, can make better informed decisions and help achieve decarbonisation targets while maintaining appropriate risk-adjusted returns.

## Sustainability financing: trends and challenges

### Regulatory developments

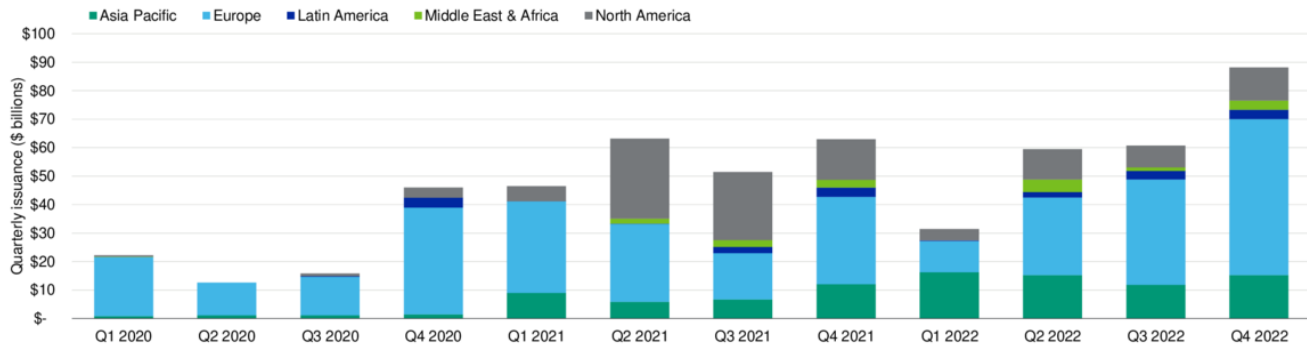
Regulators generally appear keen to support Net Zero finance, whilst encouraging banks to manage their exposure to physical and transition risks. In September 2023, the US Treasury released its *Principles for Net Zero Financing and Investment*, which outline best practices for transition finance, portfolio alignment and the setting and monitoring of financial institutions' commitments to Net Zero [vii]. In the European Union, through the ECB's *Guide on climate-related and environmental risks* [viii], banks are required to identify physical and transition-related risks to their business and conduct appropriate loan-level actions to mitigate risks that are deemed to be material. Capital requirements can be adjusted if supervisory expectations are not met. Recommended loan-level actions for banks include conducting additional due diligence, setting sectoral limits and incentivising client actions through changes to interest rates.

There are also significant upcoming disclosure requirements aimed at incentivising Net Zero finance. Over the next few years, banks will be pushed to disclose the emissions they finance through their credit portfolio as part of reporting guidance such as IFRS S2 from the International Sustainability Standards Board [ix]. In many jurisdictions this will be mandated through legislation, such as ESRS E1 in the EU [x] and SB 253 in California [xi]. As many banks likely have extensive financed emissions, this increased scrutiny will further motivate reduction of financed greenhouse gas emissions.

## Market trends

Sustainable financing presents considerable opportunities for financial institutions, with banks expected to take on the lion's share of Net Zero finance. Up to 70% of all private financial institutions' Net Zero financing is expected to flow through commercial banks [xii]. Indeed, sustainable lending has been gathering pace in recent years, with sustainability-linked loans, also known as sustainable loans [xiii] exhibiting significant growth since 2020, and currently representing around a quarter of the entire loan market in the EU [xiv]. In 2022 alone the market grew by 7%. Similar global trends are observed in the more expanded debt market [xv].

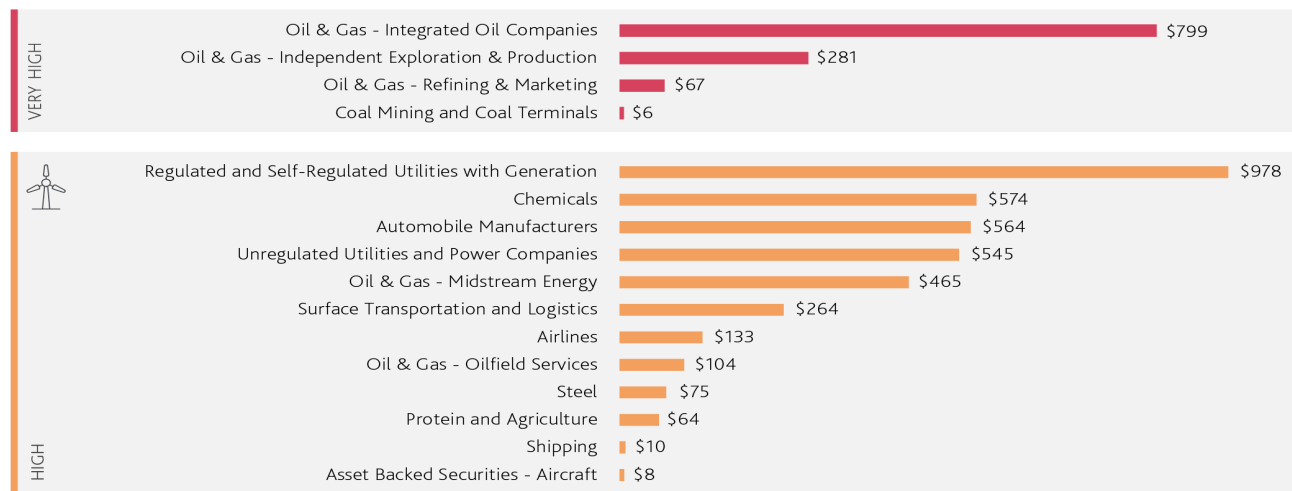
**Figure 1: Global sustainability-linked loan issuance volume, 2020-22**



Sources: Moody's Investors Service and Environmental Finance Data

Perhaps not surprisingly, given its very objective, Net Zero financing is disproportionately directed to sectors with high emissions and high transition risk. In 2022, 18% of sustainable bond issuance was in sectors with high exposure to carbon transition risk. By contrast, these sectors accounted for just 6% of Moody's rated total outstanding debt.

**Figure 2: Sectors with very high or high inherent exposure to carbon transition risk (rated debt in \$ billions)**



Source: Moody's Investors Service

## Outlook

While it can be argued that the carbon emission growth trajectory is close to an inflection point, with a likely gradual decrease beyond 2025 [xvi], this rate of change is not enough to meet declared goals. Analysis shows that the least costly way for the global economy to achieve Net Zero by 2050 is to reduce carbon emissions immediately, rather than delaying [xvii]. Lending to high-emissions sectors, if the loans can be shown to fulfil the right purpose, can help banks contribute to ambitious Net Zero goals. Ambition is required to support decarbonisation, and where banks retreat, results suffer: a study found that bank deleveraging activities after the Great Financial Crisis slowed the rate at which emissions from heavy industry were reduced [xviii].

Targeted lending also helps banks capture value. High-emission sectors have a higher perceived credit risk, as measured by the market pricing of credit-default swaps <sup>[ix]</sup>, and reducing emissions can be a way to reduce a counterparty's probability of default in an early climate policy scenario. These are also generally heavy industry sectors such as chemicals and auto manufacturing, or energy subsectors such as utilities and oil refining. They rely on expensive equipment and facilities to generate profit and require high capital expenditure to reduce carbon emissions. Investing in technology and infrastructure improvements often also makes their operations more efficient in the process <sup>[x]</sup>. Overall, such sectors can offer attractive returns to banks which are prepared to support them in their decarbonisation journey.

On the other hand, supporting high-emission sectors means that providers of Net Zero finance are often temporarily exposed to high levels of transition risk, including reputational risk. To mitigate this risk, counterparties must be examined carefully in the credit granting process to ensure that decarbonisation is financially and practically feasible, and subsequently monitored closely over time to assess that decarbonisation trajectory targets are in line with commitments. Several common challenges must be addressed to facilitate efficient, balanced and impactful Net Zero financing.

### Challenges with Net Zero financing

Key challenges centre around the ability to measure the risk and return that finance providers take on through decarbonisation funding:

#### 1. Policy and scenario uncertainty

- **Fluctuating risks:** Net Zero lending aims to achieve counterparty risk reduction by lowering carbon emissions. However, climate-related scenario uncertainty makes the nature of these risks extremely hard to measure. The price of carbon could fluctuate considerably. Regulatory compliance risks could appear at short notice. A build-up of stranded assets could cause financial instability <sup>[xi]</sup>. All of these factors, and associated market expectations, can change within the timeframe of a commercial credit facility.
- **Risk quantification:** Scenario uncertainty is particularly high because climate change is fundamentally different to economic risks that have been faced before, making it difficult to infer economic relationships using historical data. In an environment of high uncertainty, it is best to use specific scenarios to test assumptions, rather than trying to capture the entire range of probability. But this makes it challenging to quantify the 'overall' climate risk of a firm.

#### 2. Lack of counterparty data

- **Data scarcity:** Net Zero lenders can benefit from data that is not traditionally requested from counterparties, including data from third parties. Such data may be necessary to understand whether the counterparty has a credible path to carbon abatement. Bank systems may not be in place to collect and store this data, and analytics may not be in place to process it, or to interpolate when data is not available.
- **Greenwashing:** Lack of data, especially for carbon emissions, can keep loan terms and targets relatively general, and makes it difficult to monitor counterparties' progress towards these targets. This increases the likelihood of 'greenwashing': exaggerating sustainability credentials. Regulatory concern about greenwashing in Net Zero finance has recently increased based on concerns around conflicts of interest <sup>[xii]</sup>.

These challenges carry over to the credit granting process, affecting the execution of key lending workflow steps such as:

- › **Screening:** Due to scenario uncertainty and lack of data, identifying appropriate financing targets is challenging. Net Zero lending must contribute to the lender's decarbonisation targets, and these targets must be achievable without putting the obligor under unacceptable levels of financial strain. Achieving these targets should also generate an increase in the obligor's performance under climate change mitigation scenarios.
- › **Deal structuring:** Inconsistent data availability and industry-to-industry differences in abatement pathways cause a greater need for bespoke terms and negotiation. What is more, even within an industry, credit performance under decarbonisation depends on the firm's idiosyncratic characteristics, and lack of transparency in performance trajectory during the deal structuring process can drive up transaction costs for both parties [xxiii].
- › **Pricing:** Many sustainability loans use an environmental-linked pricing grid as a form of incentivisation [xxiv]. However, scenario uncertainty and lack of data make it difficult to quantify the transition risks faced by a firm in a credit-relevant way. This causes challenges with pricing to compensate for risk taking. Many banks opt to subsidise green lines of business, which helps grow the wider Net Zero lending industry but may lead to a sub-optimal risk/return profile.
- › **Covenant definition and monitoring:** Covenants are challenging to begin with because they risk making banks' lending operations less competitive by driving borrowers elsewhere. In addition to this, lack of data limits the ability to establish decarbonisation focused lending covenants. When regulatory or other environmental information on the counterparty is not available, fewer lenders feel able to issue environmental covenants because of limitations in monitoring adherence over time [xxv].

In the next sections we illustrate how some of these challenges can be addressed, and enable banks to quantify climate risks and identify opportunities for Net Zero finance. Specifically, climate scenario analysis can provide insights on the impact from associated economic changes on industries and counterparties, enabling banks to better direct and grow their Net Zero financing [xxvi]. Meanwhile, data on borrowers' financial standing and carbon emissions enriches our understanding of their competitive performance under these scenarios and informs the suitable carbon abatement financing options for them.

## Industry-level performance: winners and losers under different scenarios

### Approach

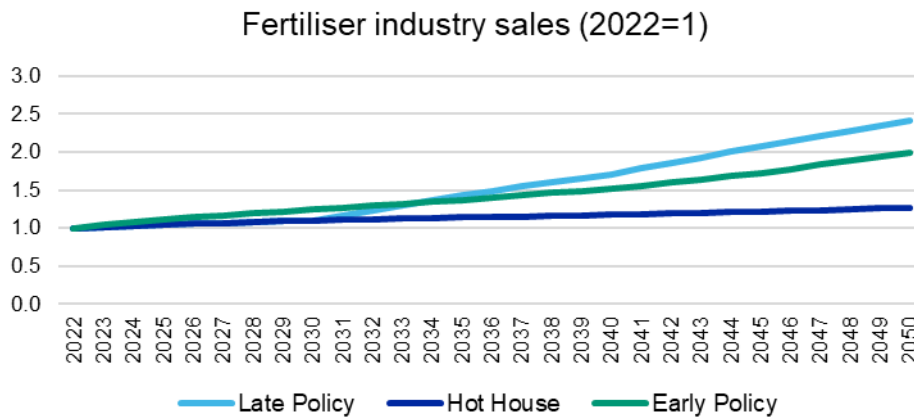
The road to Net Zero can have existential implications for entire economic sectors. At a high level, the expectation is that industries that heavily rely on fossil fuels or otherwise generate high emissions will be more at risk under Net Zero policies. Yet the precise impact is dependent on multiple factors, including the future policies themselves. In this case study, we analyse the outlook for three high-emission industries under commonly employed scenarios and treat each of them as plausible futures over the next half-century. By using NGFS III <sup>[xxvii]</sup> scenarios we can form an educated view of the potential trajectory of the sector under varying policy outcomes. *Below 2°C* is considered an Early Policy scenario, *Delayed Transition* is a Late Policy scenario, whilst *Hot House: Current Policies* is a low-abatement scenario which assumes no further abatement beyond current policies.

### Industry results

#### Fertilisers

The fertiliser industry stands to benefit from abatement policies. It is projected to grow even under the low-abatement scenario, albeit moderately. The most rapid growth is expected under the Late Policy scenario because the transition to Net Zero is assumed to be faster than in the Early Policy scenario. Abatement increases demand for fertiliser due to increased need for bioenergy crops. Fertilisers also see stronger demand through improved global economic growth in the longer term compared to the low-abatement scenario.

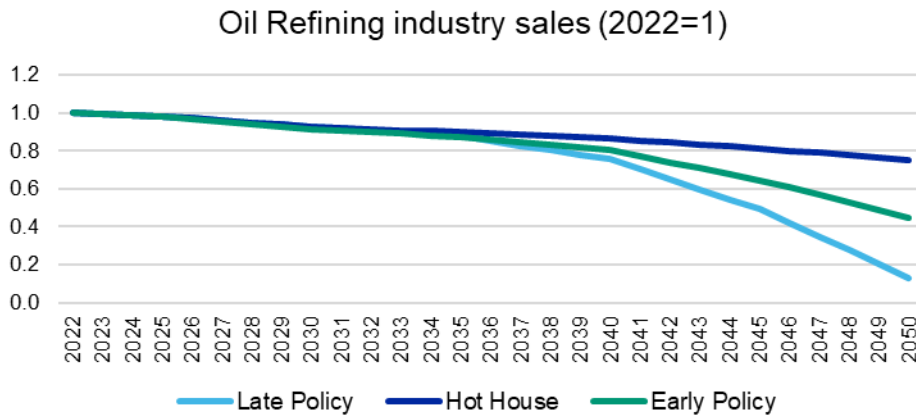
Figure 3: Forecast of Fertiliser sector sales through to 2050 under climate scenarios



#### Oil Refining

The oil refining industry is forecast to contract in all three scenarios. The contraction is most dramatic and extensive in the Late Policy scenario. Oil refining declines due to the shift to renewable energy in transportation. This is already underway and continues to some extent even in the low-abatement scenario. It also declines due to the imposition of costs on carbon emissions, also impacting other industries that use oil, such as petrochemicals.

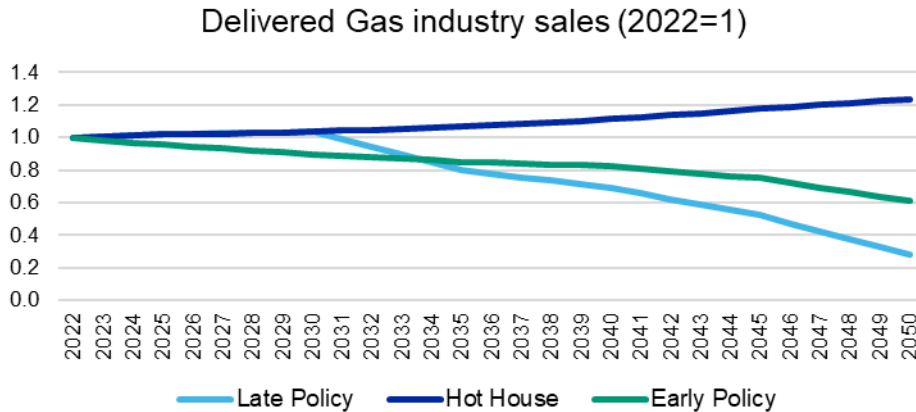
Figure 4: Forecast of Oil Refining sector sales through to 2050 under climate scenarios



**Delivered Gas**

The delivered gas industry expands in the low-abatement scenario but contracts in the other two scenarios. Delivered gas has seen investment in recent years as an alternative to higher carbon emissions fuels, especially coal. However gas is a fossil fuel itself, so under the Early and Late Policy scenarios it is still forecast to be gradually replaced by greener sources of energy.

Figure 5: Forecast of Delivered Gas sector sales through to 2050 under climate scenarios



**Implications**

Of the three industries studied here, the fertiliser industry outlook appears positive regardless of which scenario will materialise. In fact, unlike oil refining and delivered gas, it stands to benefit under a wide range of scenarios. At the same time, because it generates above-average emissions, Net Zero policies are expected to affect the industry, presenting a potential opportunity for finance providers to support its growth. Lending decisions, however, typically concern the specific borrower firm, and while industry-wide trends can be useful, they are not sufficient to understand a firm’s suitability for Net Zero lending. In the next section we indeed see that the firm-level view provides much richer and useful information to decision makers.



## Firm-level performance: impact of decarbonisation on financial and credit metrics

### Mechanisms for impact

Several factors may impact a firm’s future success, including its technological advancement and capital structure, consumer preferences for its products and services, and government fiscal and regulatory policy. Firm-level assessment can shed light on an obligor’s potential performance from greening their operations through carbon abatement.

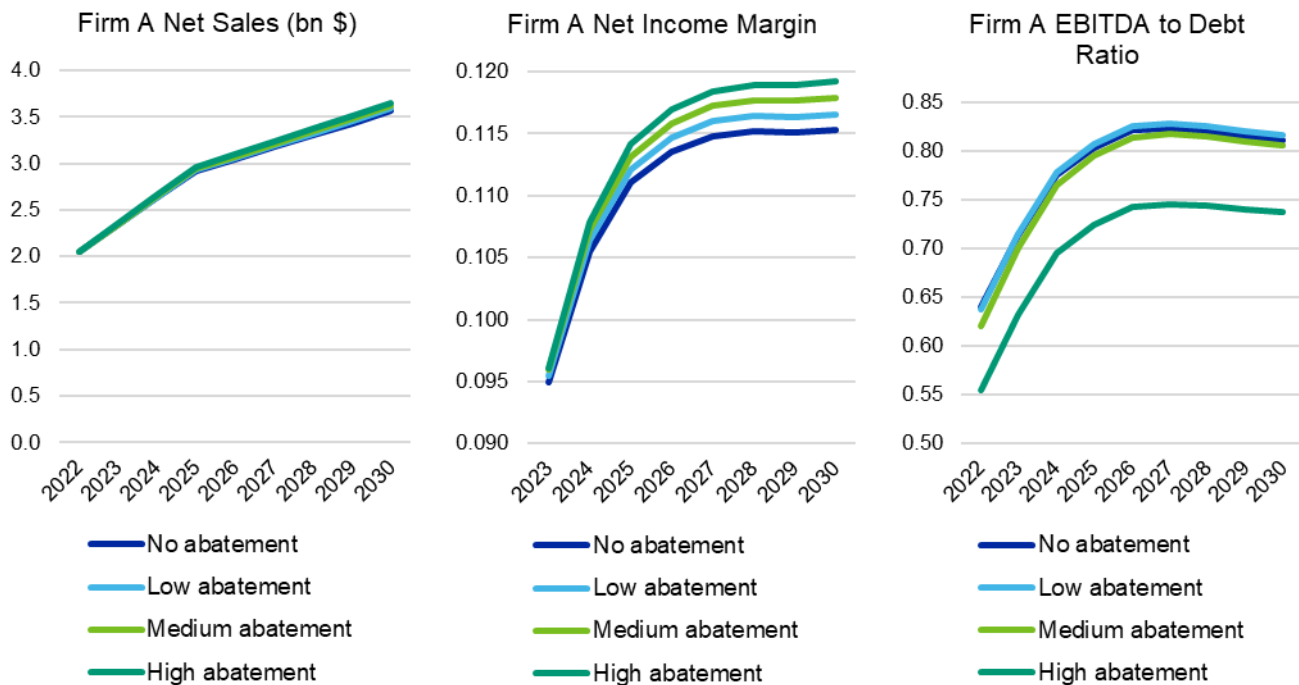
To enable lenders to form decision-useful views, we leverage Moody’s EDF-X™ Climate Smart Projections, which decompose climate scenarios into granular impact on the obligor’s financial statements, thereby generating climate-adjusted projections and credit risk quantification. Our methodology applies an oligopoly model to identify differences between firm performance under a specific climate scenario, and to identify the impact of firms’ own decarbonisation actions. In this case study, we use the *Below 2°C* scenario (an Early Policy scenario) on three modelled firms within the fertiliser sector and assess their performance under four decarbonisation options: high, medium, low and no carbon abatement [xxviii].

Through this analysis we can establish which abatement option is preferable for the firm, by investigating impact on various financial and risk metrics. This information can be used for targeted and effective engagement with the borrower, reduce uncertainty for the lender and support the structuring of appropriate financing according to borrower needs. Applying the lender’s judgement and expertise to reach a decision on the optimal level of Net Zero financing becomes easier.

### The case of a low emitter

#### Financial metrics

Figure 6: Forecast of Sales, Net Income and Leverage for Firm A under different abatement options

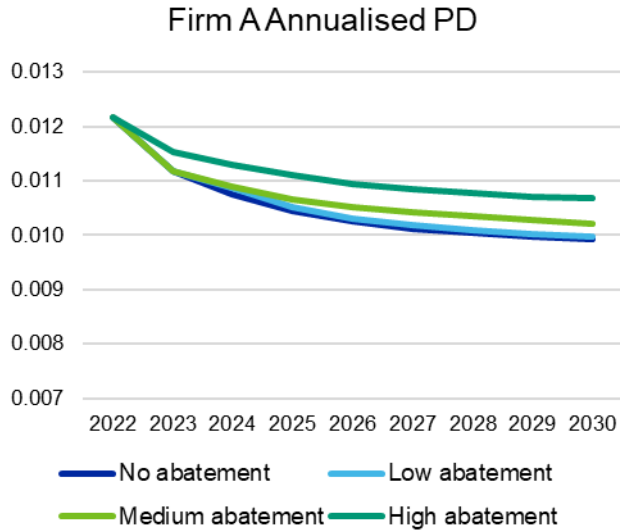


Firm A has exceptionally low emissions intensity, 91% lower than the industry average for firms in our sample [xxix]. In this Early Policy scenario, Firm A’s low emissions enable it to avoid costs and capitalise on its green credentials, leading to a steep increase in revenue and improved profitability. As Firm A already benefits from its green operations compared to its competitors even with no further abatement; the incremental effect of high abatement in sales and income is positive but

marginal. Meanwhile, the increasing debt burden from lending-financed abatement can be material, as shown by the deterioration in the EBITDA to Debt ratio under the high abatement action.

**Credit metrics**

**Figure 7: Forecast of PD for Firm A under different abatement options**



In line with the improved financial performance, Firm A’s creditworthiness is expected to improve under the Early Policy scenario, however the greatest decrease in PD is achieved if the firm chooses to not take on the additional debt needed for abatement. Overall, abatement through bank lending can be challenging when a firm already has very low emissions, as the potential competitive benefits can be outweighed by the increased debt burden.

**Higher emitters benefit from abatement, but at what cost?**

**Financial metrics**

**Figure 8: Forecast of Sales for Firms B and C under different abatement options**

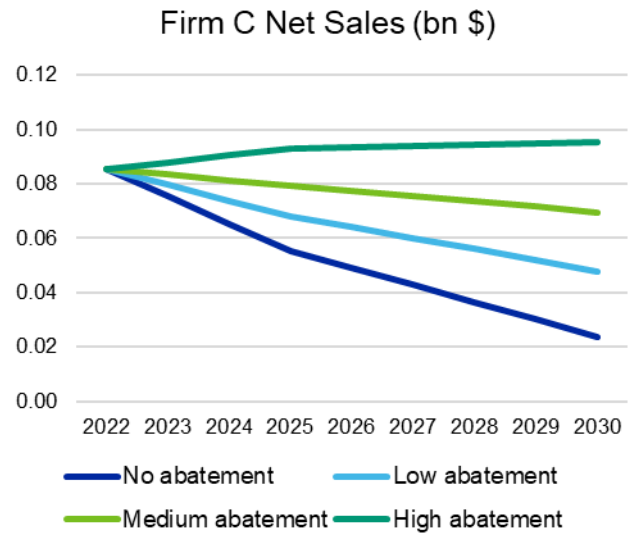
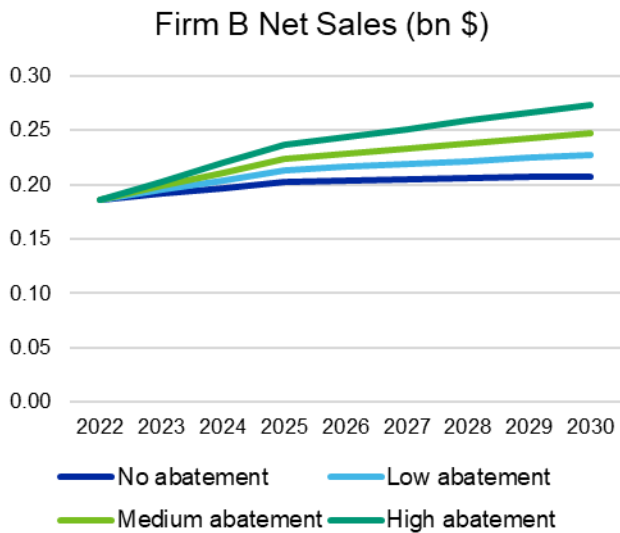
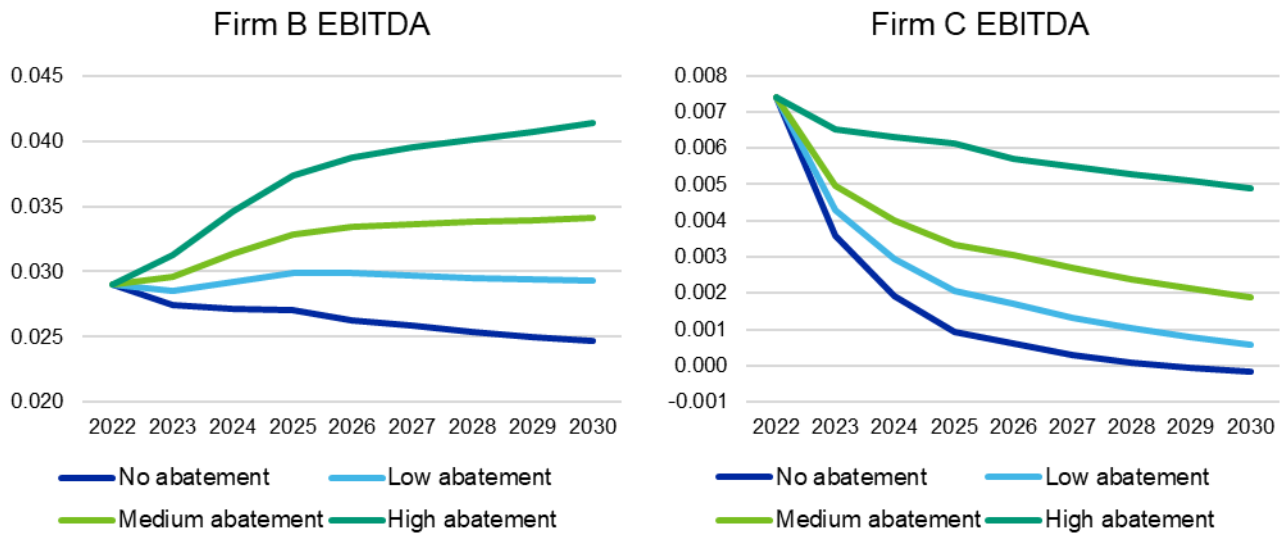
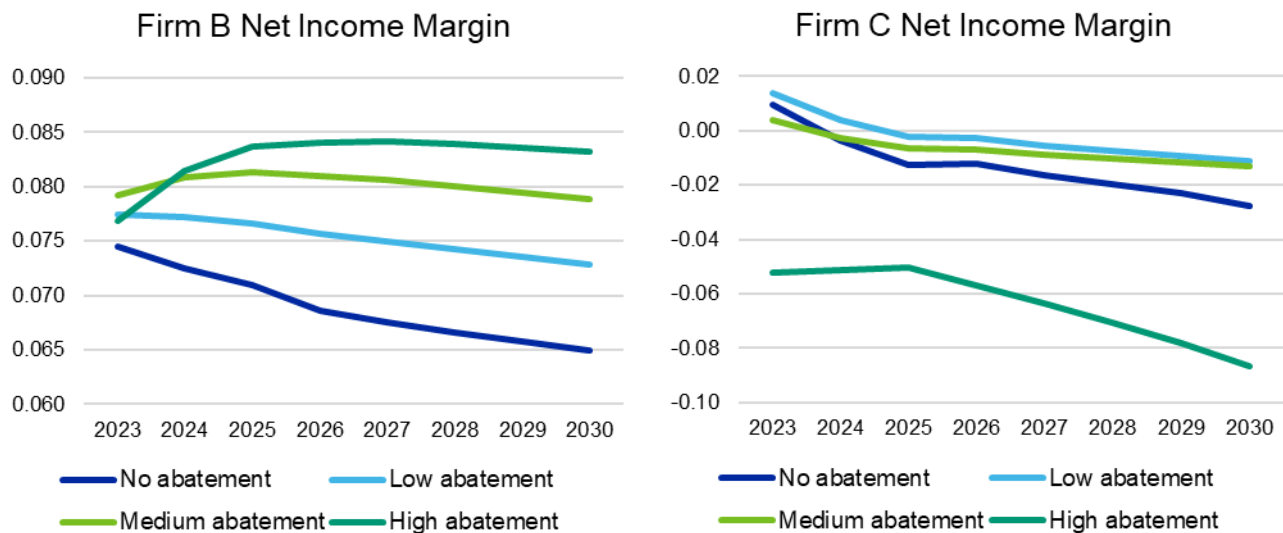


Figure 9: Forecast of EBITDA for Firms B and C under different abatement options



By contrast, firms with higher emissions intensity can more easily capture the financial benefits of individual abatement action. Firm B’s emissions intensity is roughly average for the sector, and Firm C’s emissions intensity is above average. Under this Early Policy scenario, both firms clearly benefit from higher levels of abatement, as shown by their improved sales (Figure 8) and earnings (Figure 9) forecasts. For both firms, high abatement produces the highest net sales and EBITDA. For the higher emitting Firm C specifically, significant carbon abatement appears the only option to remain competitive and avoid a downward sales trend. However, this gain from abatement must be evaluated against Firm C’s overall downward trend in earnings, which makes it a risky prospect.

Figure 10: Forecast of Net Income for Firms B and C under different abatement options

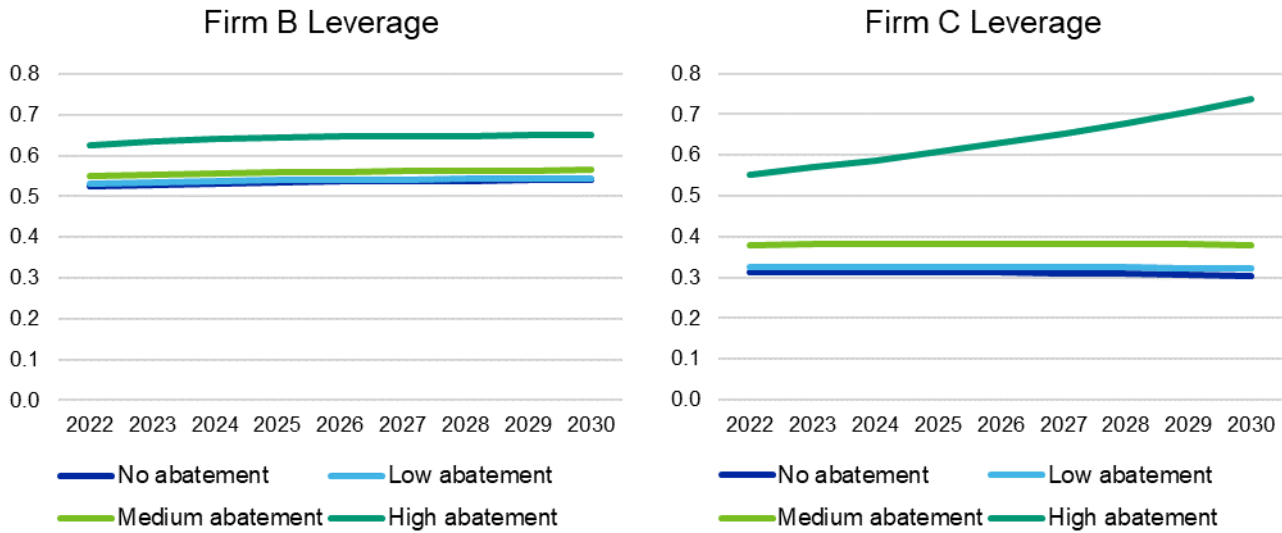


Net income margin (Figure 10) shows the fine balance between improvement in a firm’s operative profitability and the higher interest expense when financing abatement through debt. Firm C has a lower initial profit margin than Firm B, as can be seen by comparing no-abatement values in Figure 10. At the same time it needs more capital expenditures to implement abatement due to its higher emissions intensity, and therefore requires substantially more debt. As a consequence, Firm C’s interest expense increases more dramatically, accounting for much of the downward effect on net income margin. In fact, the increase in interest expense in the high abatement case is generating persistently negative margins. The increased debt burden also pushes up Firm C’s leverage (defined as ratio of total liabilities to total assets) more than Firm B’s (Figure

11)<sup>[xxx]</sup>. In the high abatement case Firm C's leverage increases over time as it struggles with losses and requires additional financing.

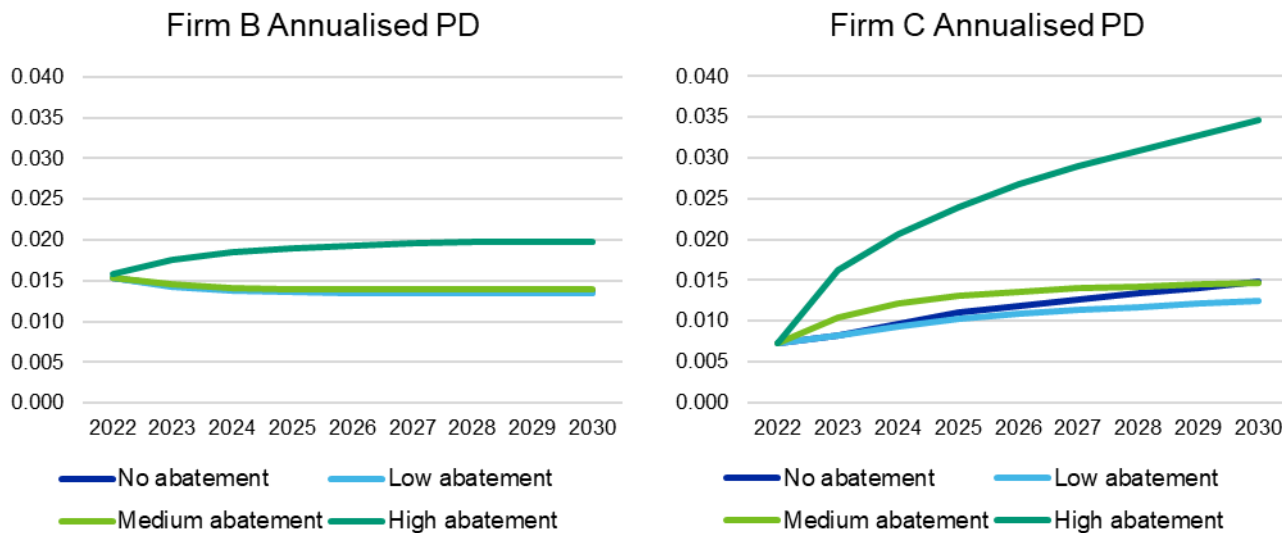
Based on net income and leverage considerations, Firm C appears to be a weaker candidate for Net Zero lending compared to Firm B. In fact, Firm B is forecast to generate the highest net income margin (at least from 2025 onwards) under high abatement action, underscoring its suitability for Net Zero financing.

**Figure 11: Forecast of Leverage for Firms B and C under different abatement options**



**Credit metrics**

**Figure 12: Forecast of PD for Firms B and C under different abatement options**



It can be argued that Firm C's emissions intensity puts its competitiveness in significant threat, and it is therefore in pressing need for decarbonisation. It also has the lowest starting (current) PD of the three firms analysed here. On the other hand, it is particularly vulnerable to increasing debt and this compromises its ability to finance decarbonisation through borrowing. Firm C would be well advised to explore other means of financing.

Firm B 's creditworthiness on the other hand remains fairly flat through to 2030. Under high abatement, the PD deteriorates moderately, such that it triggers a rating downgrade under Moody's EDF-X™ PD Implied Ratings. In this case the increased leverage partially offsets the abatement benefits on sales and profitability. Nonetheless, Firm B appears to be a good prospect for a potential Net Zero lender.

Overall, identifying the right candidates for Net Zero lending requires a deep understanding of each firm's financial position, including carbon emissions, and the ability to generate robust performance forecasts under various scenarios and assumptions. Low-emission firms may not have enough to gain from debt-financed Net Zero investments. Conversely, high-emission firms can appear good candidates for Net Zero financing, assuming that they have viable paths and credible plans to rapid decarbonisation. However, the mode of financing matters. The type of analysis deployed in this paper provides useful insights for both lenders and borrowers, helping them identify business opportunities of abatement and work out the best way to finance it, for example through a combination of debt and equity.

## Conclusion

In an effort to spur Net Zero transition, mitigate climate change and improve economic outcomes for all, Net Zero finance has begun to step up, extending credit aimed at eliminating the carbon footprint of firms and individuals. However, throughout the credit granting process, commercial lenders face obstacles in exploring opportunities that appropriately balance risk and return. These obstacles include the difficulty in interpreting climate scenarios, the scarcity of climate and environmental counterparty data and limitations in the ability to translate climate related inputs into actionable credit information outputs. This leads either to financing actions that carry significant uncertainty and risk, or no Net Zero financing action at all.

To overcome these obstacles, lenders can benefit from adopting a multi-level approach to counterparty climate risk and opportunity assessment. An industry-level view provides context on the economic impact of different scenario pathways, while a firm-level view combines emissions data with projected granular financial performance to unlock firm specific insights.

Such an approach can shed light into questions that require a firm-level answer, such as: what is the right balance between increasing debt and sales growth? How does a firm's profitability or size impact its suitability for Net Zero lending? How does a firm's current emissions affect its ability to gain competitiveness from abatement? What is the optimal level of abatement to fund through which financing mode?

Many firms may superficially seem like good candidates for Net Zero lending, for example because they are in industries that benefit from Net Zero, have significant scope to reduce emissions or have good carbon performance, providing opportunistic "greenification" of a lender's credit portfolio. But they may in fact be poor candidates. For a lender to assess which is which requires a thorough understanding of the risks, opportunities, commitment and outlook of their borrower. With appropriate insight, the undesirable potential for information asymmetry and misalignment of incentives is mitigated, leading ultimately to better allocation of scarce financial resources.

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## Endnotes

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- <sup>xxviii</sup> *The quantitative results in this section are based on the following analysis of financial statement projections. Based on each firm's current emissions intensity (t CO<sub>2</sub> per USD revenue), we determine the amount of emissions necessary to abate annually in each of the four decarbonisation options. We use Marginal Abatement Cost curves derived from the GCAM integrated assessment model to quantify the cost of abatement in each year between 2023 and 2030. To simplify the analysis, we assume that to achieve a given abatement option, the firm has to make initial capital expenditures in 2023 in the amount of the total present discounted value (2023-2030) of the abatement costs. To finance these capex, in 2023 the firm takes on additional debt in the total amount. This leads to a rise in the firm's debt level, and thus in its annual interest expense. At the same time, emissions intensity of the firm is reduced according to the abatement option chosen, with implication for the firm results calculated by our oligopoly competition model. For this study, 15% reduction in carbon emissions is classified as low abatement, 30% reduction in emissions as medium and 50% reduction as high. Any other abatement level and options can be considered: the selected percentages were chosen for illustration.*
- <sup>xxix</sup> *Firm A is a real firm. Firms B and C are real firms, but with real emissions data replaced with modelled emissions data to better illustrate the impact of variation in emissions.*
- <sup>xxx</sup> *Firm C also starts with fewer assets per unit of sales than Firm B, which makes it more susceptible to increasing leverage.*