



Research partnership – 2° Investing Initiative 2°C scenario analysis for corporate lending portfolios

The 2° Investing Initiative (2°ii) developed an open-source, IP-rights free model that assesses the exposure of both equity and bond portfolios to transition technologies across key sectors (energy, power, transport, cement, and steel) and the alignment of that exposure with 2°C scenarios. The model has been piloted on over 2,000 financial portfolios, representing over \$10 trillion in assets under management, across over 1,500 financial institutions around the world.

2°ii has now launched a research program to expand the model to banks' corporate lending portfolios. The expansion is designed to overcome two key barriers that banks currently face on 2°C scenario analysis:

1. **Data challenges.** Assessments currently rely either on expensive data collection systems across a large universe of counterparties or sector-level data estimation models. Nascent unique identifiers and structured data collection mechanisms at group level mean that granular information for 2°C scenario analysis is still largely missing.

Solution: This project seeks to overcome these challenges by relying on asset level data across key transition sectors (energy, power, transport, industry) and using text-string matching software as well as LEIs (where available) to map the owners of these assets to the banks' corporate lending portfolios. This provides for a near universal coverage across listed and non-listed counterparties at specific technology level (e.g. renewables vs. coal, electric vs. ICE, electric arc furnace vs. blast-oven furnace) for key economic activities (~80-90% of CO2 emissions of a typical lending portfolio).

2. **Methodological challenges.** Modelling work on banks' lending is limited to date. Key questions around attribution, consolidation, and other model rules lack guidance, making modelling work both uncertain and more expensive for banks. In addition, the specific characteristics of lending create unique challenges relative to institutional investors, notably the need to distinguish 'capital exposure' (i.e. the lending footprint of a bank – lending with a specific purpose) and 'counterparty exposure' (i.e. the exposure to counterparties – group level finance).

Solution: The project pilots a range of modelling applications, tests the sensitivities of results to different modelling choices, and provides an open-source methodology document, software, and modelling framework that can be used by banks to navigate methodological challenges when they either use open-source or proprietary models, understand the pros and cons of different modelling choices, and evaluate the most appropriate solutions. These outputs will also inform the standardization process of the Science-based Targets Initiative for Financial Institutions and ISO 14097.

Project outputs.

1. **Matching software to match economic assets with unlisted financial assets.** Matching non-listed, non-uniquely identified financial instruments with economic intelligence databases (i.e. asset databases on power plants, automobile plants, oil & gas fields, etc.) in corporate lending portfolios. Together with asset-level data, this will enable participating banks to overcome the data challenge for large lending portfolios associated with non-listed counterparties and other counterparties for which climate-related data is not readily available in a homogenous and low-cost way. The output will be tested in partnerships with participating banks on their lending portfolios, with the underlying matching

software and calibration for matching instruments made publicly available at the end of the project. The data mobilize for this project covers around 90% of CO2 emissions in the portfolios

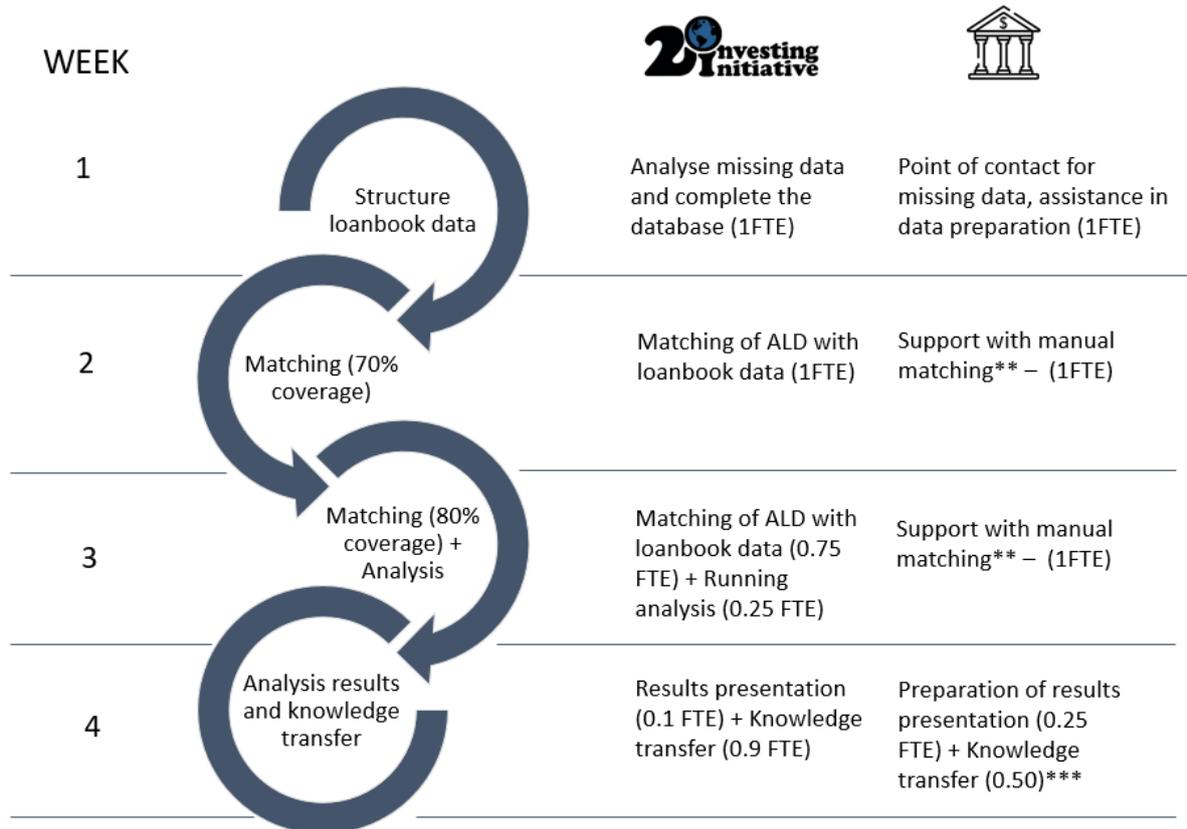
2. **Road-testing the 2°C scenario analysis.** Expanding the existing open-source software and IT-infrastructure of 2°ii available for public use in order to allow for efficient, independent, and high-volume assessment of lending portfolios across portfolios, with the ultimate objective of facilitating the opportunity for participating banks to initiate in-house 2°C scenario analysis in the future independent of the technical support of 2°ii. In addition to the technical development, 2°ii will conduct a confidential pilot application on the corporate lending portfolios of participating banks, including preparatory meetings, in-house analysis by a 2°ii analyst, and a preparation of a short explanatory report on the pilot results and how they can be interpreted and used by participating banks in the future. All results of the analysis will be kept confidential. The learnings of the road-test will be published in a public-facing report, co-branded (if desired) with the participating banks, containing the methodological lessons and other key findings (anonymized). The underlying software applied in the road-test will also be made publicly available.

Project costs, targeted timeline & delivery.

Costs & resources. The participation in the pilot is free of charge to banks. The following three participation levels can be chosen by the bank. These can be reviewed on an individual basis based on the banks’ specific needs and resources.

Benefits & requirements	Bronze	Silver	Gold
<i>Scenario analysis</i>	2°C scenario analysis of the corporate loan book		
<i>Visibility</i>	Mentioned as pilot partner in public communication	Co-branding of the methodology report	Co-branding of the methodology report & Sponsorship of launch event Membership benefits (<i>details upon request</i>)
<i>2°ii research grant</i>	n/a	€20,000 2dii research grant (<i>tax deductible</i>)	€40,000 2dii research grant (<i>tax deductible</i>)

The implementation of the methodology requires approximately 20 to 30 working days. All participation models require the support of a ‘project partner’ to coordinate within the bank and with the 2°ii team. Tasks, related skills and time involvement required by the ‘project partner’ are specified below. Several staff members can be involved in the project and in different stages. 2°ii is partnering with external consultants to carry out the analysis. Banks can use a vendor of their choice. 2°ii will provide specifications as to technical requirements of the consultant (e.g. R Studio skills). A list of potential service providers & individuals can be provided upon request.



* Full understanding of loan books data availability and people to contact in case of missing data

** IT or intern

*** Risk, sustainability team and/or top management

Delivery. The analysis will be conducted on banks’ premise and IT infrastructure. 2°ii will load its software and data infrastructure on a dedicated bank computer. Software requirements are limited to R Studio, including a few packages. Detailed technical specifications can be provided upon request. No portfolio data will leave bank servers and NDAs can be signed upon request. The software is open source and can be used by the bank after the project. All non-portfolio relevant data will be deleted after the pilot.

Timeline. The project pilot will start in February 2019, with analysis starting prior across some banks and is set to go until December 2019. The project partner and 2ii will jointly agree on the timeline for the analysis.

ABOUT 2° INVESTING INITIATIVE.

The 2° Investing Initiative is the leading global think tank on developing climate metrics in financial markets.

- Leading research.** Over the past 4 years we have led three EU-funded projects (Total budget: EUR 6 million) designed to develop both publicly available and IP-rights free 2°C scenario tools for financial portfolios (*SEI metrics*), as well as risk management tools (*ET Risk*), and target-setting (INVECAT). The projects involved over 20 research partners, including universities (Frankfurt School of Finance, University of Zurich), financial industry (S&P Market Intelligence, Kepler-Cheuvreux), consultants (The CO-Firm), and NGOs (Climate Bonds Initiative, CDP, WWF), and international organisations (UNEP-Fi, UNFCCC).
- Global partnerships with the financial industry.** We have partnered with over 250 financial institutions on scenario analysis for equity and / or corporate bonds portfolios, three financial supervisory



authorities, two governments and two federations on supporting 2°C scenario analysis among financial institutions. Together with ING and other major international banks, we are currently in the process of developing an open-source scenario analysis tool for corporate loans.

- **Scenario analysis initiatives.** 2°ii is also leading a range of research projects on providing the ‘inputs’ into financial institutions 2°C scenario analyses. 2°ii is a founding partner of the Asset Data Initiative (ADI) and the Science-Based Targets (SBT) working group on financial institutions. 2°ii also participated in the FSB TCFD scenario working group and the EC High Level Expert Group on Sustainable Finance (HLEG). 2°ii Director Stan Dupre is also co-chairing the ISO 14097 working group on impact of financial institutions climate action together with the UNFCCC Secretariat.
- **Independent research.** The 2° Investing Initiative has a multi-stakeholder and independent governance framework designed to ensure the intellectual integrity of its work and its independence. Thanks to its non-advocacy position and technical emphasis, it enjoys the trust and confidence of central banks, insurance companies, banks, and pension funds, as well as the broader scientific and NGO community.

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ANNEX 1: TECHNOLOGY EXPOSURE SOFTWARE

2° Investing Initiative will provide technical support to each participating bank in applying 2°C scenario analysis. The key challenge we identify in this context is that there is a climate data gap that many banks face in identifying the energy technology exposure of the companies in their lending portfolios, given the lack of (standardized) reporting, in particular for non-listed companies.

Lacking this information, analysis has to be default sector-level, which may miss the critical questions of transition pathways that these companies are on. A utility can be 100% renewable or 100% coal and the 2°C scenario analysis for either is likely to be fundamentally different. A combination of sector & energy technology exposure analysis can thus reveal more detailed information about the lending portfolio, either as use directly in terms of 2°C scenario analysis of the kind that the UK pension fund TPT and French insurance company AXA were recognized for in the French climate disclosure awards, or serve as inputs for traditional bank models. Sector level exposures thus have to be complemented with sub-sector technology estimates.

2°ii has built a software that calculates this sector and technology exposure information for corporate bonds and listed equity portfolios and compares these exposures to benchmarks in the 2°C scenarios from the International Energy Agency or related organizations. The model builds on access to global, economic intelligence databases of infrastructure assets (e.g. coal fields, oil & gas plays, power plants, car factories, airplanes, ships, cement factories, steel plants) covering >90% of global assets for most sectors.¹ These assets are then mapped to their owners and the parent companies of these owners, and ultimately to financial assets to calculate exposures.

The model is technology based, but includes data around associated GHG emissions factors, allowing for both a technology and GHG emissions assessment at sector level. For the majority of sectors it covers, in particular energy, power, and transport, it integrates forward-looking data, allowing for a comparison with the scenario trend. Since it doesn't rely on traditional reporting channels (e.g. annual reports), it can calculate exposures across a wide universe of listed and non-listed companies, as well as other actors (e.g. municipalities). It can also identify exposures for non-utility companies (e.g. oil & gas).

More information on the model can be found at www.transitionmonitor.org.

¹ 2° Investing Initiative (2016) "Asset-Level Databases". NB: This estimate is limited to utility- or enterprise-scale assets and thus does not consider for example residential solar PV assets in the sample.