CLIMATE ALIGNMENT ASSESSMENT 2020
BRIEFING FOR INVESTORS

December 2019

2° Investing Initiative

PACTA
Paris Agreement Capital
Transition Assessment

ABOUT 2°C INVESTING INITIATIVE

The 2° Investing Initiative (2°ii) is the global think tank for developing climate and long-term risk metrics and related policy options in financial markets. 2°ii coordinates the world's largest research projects on climate metrics in financial markets, with over 40 research partners in the public, private and philanthropic sector, and over 3€ million re-granted to research partners to date. As part of this work, 2°ii developed the first climate scenario analysis tool for financial portfolios, applied by over 200 financial institutions and three financial supervisory authorities to date. 2°ii also initiated the first climate-related financial regulation in Europe in the context of the French mandatory climate-related disclosure by financial institutions (Art. 173), in addition partnering with the Swiss government on 2°C scenario analysis, involving two-thirds of the Swiss pension funds and insurance market.

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BACKGROUND

This note provides a technical briefing as to the suite of PACTA (*Paris Agreement Capital Transition Assessment)* modules & analytics that can be applied by financial institutions. The tool will contribute to the government initiative launched at NY Climate Week in September 2019 involving an assessment of the alignment of financial markets and flows with climate goals in 2020, in collaboration with 10 countries.

The document summarizes the key technical components, how they are applied, and how they can be used by financial institutions in practice. Specifically, the briefing discusses three analytical components within the PACTA framework, notably climate scenario analysis (also known as climate compatibility tests), climate stress-tests, and qualitative analysis of climate actions. Also covered in this briefing is the analysis of the Swiss real estate sector developed by Switzerland.

1 **Climate scenario analysis / Climate compatibility test.** The first building block of the PACTA tool is the "climate compatibility test" or climate scenario analysis – using the language of the FSB Task Force on Climate-related Financial Disclosures. The analysis covers three components, specifically a) an analysis of the portfolio's current exposure to climate-relevant sectors, b) an analysis of the alignment of the investment and production plans of the companies in the portfolio with global climate goals, and c) an analysis of the portfolio's future technology exposure relative to scenarios and the market.

2 **Stress-testing climate-related risks.** The second component of the analysis involves a calculation of potential losses under 'climate stress-test scenarios', considering physical, legal, and transition risks.[1] The stress-test scenarios will consider a range of public scenarios designed in partnership with financial supervisors, notably the Bank of England and the European Insurance and Occupational Pensions Authority (EIOPA).

3 **Qualitative analysis of climate actions.** The third analytical component is a qualitative analysis of climate actions by financial institutions.

What is new. Several financial institutions, through pilot projects like the one conducted in Switzerland in 2017, through the Transition Monitor website (www.transitionmonitor.com) and through other channels, have applied parts of the PACTA framework to equity and corporate bond portfolios, notably the climate compatibility test. The following summarizes the key innovations relative to the existing ecosystem of analysis:

- Addition of a stress-test module quantifying potential losses;
- Streamlining of the climate scenario analysis tool to make it easier to understand and act on the results;
- An addition of a qualitative component that highlights not just 'portfolio exposures', but actions underpinning these exposures;
- Articulation with and linkages to other tools in the market, notably the Swiss real estate analytical tool developed in 2018 / 2019;
- Addition of a further sector (heavy duty vehicles).

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[1] Physical risks relate to the physical effects of climate change and transition risks to financial risks arising as a result of attempts to mitigate physical risks. Legal risks in turn are related to liabilities arising both from transition and physical risks

FAQ

Q: Where can I find more information about the project?

A: You can find more information about the project at www.transitionmonitor.com/pacta-2020 including the briefing note and other information related to this project.

Q: How can I participate in the project?

A: If you are interested in participating in the project, please email us at pacta2020@2degrees-investing.org. In addition, 2°ii hosted a technical webinar on November 11th, available online. Country-level seminars & webinars will be organized in the course of Q1 2020 as desired.

Q: How much does it cost to participate?

A: Participation is free of charge. But, the project benefits from a range of stakeholders, such as governmental institutions, that funded the development of the tool set which now allows for automated processing.

Q: Why should I participate in the coordinated test instead of running the analysis on my own using the online tool?

A: Financial institutions can currently run the PACTA tool at www.transitionmonitor.com/participate. There are several benefits however from participating in the internationally coordinated test round, notably:

- Ability to compare results directly to your 'peers' in your country / financial institution group;
- Addition of new sectors (heavy duty vehicles, real estate in some markets);
- Consideration of qualitative elements;
- Contribution to broader awareness-raising and dialogue with policymakers – including on facilitating the minimization of reporting burdens;
- Update portfolio templates considering TCFD-recommendations;
- Additional to pdf reports, the evaluation results will be presented in a dynamic online platform with a personalized log-in

Q: What is the timeline of the project?

A: The project will take place in 2020. Specific timelines may vary in different countries, but the overall timeline will involve the following steps:

- March to May – Input of the portfolio data & response to questionnaire
- June – August – Analysis of the portfolio data and preparation of the results
- September – November – Participants receive automatically generated individual test reports with peer comparison at the same time; Publication of country studies with aggregated data (meta-studies) and provision of results to participating financial institutions.

Q: How can I submit my portfolio for analysis?

A: You will be able to upload the listed equity and corporate bond portfolios under a dedicated link (separate to the Participate link) in Spring 2020. A dedicated platform will be provided for each participating country and its institutions. For banks, 2°ii will provide an open-source software that can be used to perform the analysis on lending portfolios on-site. Portfolios should be effective as of 31.12.2019, as well as contain for equity and corporate bonds a list of ISINs with corresponding market values and currencies. We will evaluate each Funds according to all listed direct holdings within the

Fund. A sample portfolio that illustrates the proper formatting and content can be found on the website. For Swiss real estate and mortgage portfolios a list of 'EGID'-numbers or address data must be filled in the corresponding template. In addition, participants can voluntarily fill out a qualitative template covering climate strategies and action.

Q: What asset classes and sectors are covered in the analysis?

A: This analysis covers listed equity, corporate bonds, and corporate loans in the power, automotive, oil and gas, coal mining, aviation, shipping, cement, and steel sectors. For Switzerland, also real estate can be covered with a separate module (see section 1.6). Coverage for individual parts of the analysis may vary based on data availability – see sections 1.2 and 2.2 for details.

Q: Will my portfolio information be kept confidential?

A: All data provided or downloaded in the process of using the online tool is kept confidential and will not be distributed or used for purposes other than running the analysis and providing results, as well as anonymized use for meta-studies and peer comparison. Before uploading the data, 2°Investing Initiative will sign a non-disclosure-agreement. For the online tool, 2° Investing Initiative uses a stand-alone server, i.e. no other website or information is stored on the server, which increases the security significantly. The server is set up in compliance with the security standards of the German Federal Data Protection Act (BDSG, "Bundesdatenschutzgesetz"), Tele Media Act (TMG, "Telemediengesetz"), and is built on infrastructure that is DIN ISO/IEC 27001 certified.

Q: Will I be required to publish the results?

A: You will not be required to publish the results. The project will involve however the publication of aggregated, anonymized 'country reports'.

Q: How does the PACTA analysis differ from portfolio carbon footprinting?

A: This analysis assesses the alignment of a portfolio with different climate scenarios based on forward-looking production and capacity metrics. Carbon footprinting, on the other hand, relies on backward-looking data. Portfolio carbon footprinting also requires the normalization by financial units, which both prevents the benchmarking to scenarios, as well as a meaningful comparison between the climate performance of companies.

Q: Will the project give me information on what climate actions I can take?

A: 2° Investing Initiative and its partners are not regulated investment advisors, managers, or consultants and are thus not regulated to give financial advice. Moreover, the current evidence as to the effectiveness of one strategy over another is limited. More evidence-building is required, to which this project will hopefully contribute. To facilitate actions however, the briefing will involve an overview of potential actions taken by peers and individual case studies. 2° Investing Initiative will also launch a "Target-setting module" on the Transition Monitor Platform for participating financial institutions in this PACTA 2020 tests that they can use to set explore different strategies, develop climate actions and targets, and ensure alignment with external target-setting standards.

For participants interested in climate related stress stets, a voluntary test can be performed as part of the project (see chapter 2).

Q: I have another question that is not answered in this briefing.

A: Please get in touch with us at pacta2020@2degrees-investing.org

PART ONE:

CLIMATE SCENARIO ANALYSIS

1.1 OVERVIEW OF METRICS FOR SCENARIO ANALYSIS

The first part of the analysis is a climate scenario analysis, which provides an assessment of a financial portfolio's alignment with different climate scenarios from the IEA. It gives answers to three questions, each corresponding to a metric included in the results of the analysis:

1

Research Question. What share of the portfolio is currently exposed to activities in sectors affected by the transition to a low carbon economy?

Metric. The current technology exposure shows the estimated share of the portfolio that is exposed to the following sectors, representing roughly ~75% of global CO_2 emissions and an estimated ~80% of CO_2 emissions in a typical equity or corporate credit (bonds, loans) portfolio: power, automotive, oil and gas, coal mining, aviation, shipping, cement and steel.

2

3

Research Question. How aligned are the investment and production plans of companies in the portfolio with different climate scenarios and the Paris Agreement?

Metric. The 5-year trend analysis traces the portfolio's evolving exposure to selected technologies relative to four IEA transition scenarios—the Beyond 2° Scenario (B2DS), Sustainable Development Scenario (SDS), Stated Policies Scenario (SPS), and Current Policies Scenario (CPS). It also compares the portfolio's trajectory to the trajectory of the global listed equity or corporate bond market over the next five years. It is expressed as a percentage deviation from the scenario, as well as a deviation in units of capacity or production (e.g. Megawatt, cars produced). A separate analysis is provided for the alignment of real estate and mortgage portfolios with the Swiss decarbonization pathway of this sector.

Research Question. What is the portfolio's technology mix in climate-relevant sectors expected to look like in five years based on current investment plans of the companies underlying the portfolio, and how does it compare to peers, the market, and a technology mix aligned with the Paris Agreement?

Metric. This metric illustrates the portfolio's expected technology mix in the power, automotive, oil and gas, and coal mining sectors in five years based on the current investment plans, based on the results of #1 and #2, and compares it to peers, the market, and a technology mix aligned with a climate scenario that meets Paris Agreement goals.

1.2 OVERVIEW OF INPUTS AND COVERAGE FOR SCENARIO ANALYSIS

Coverage

Asset Classes. The analysis covers listed equity, corporate bonds, and corporate loans[2]. An additional analysis is possible for the Swiss real estate sector.

Sectors. The analysis covers climate-relevant sectors that are key to the transition to a low carbon economy. These include the power, automotive, oil and gas, coal mining, aviation, shipping, cement, and steel sectors, which together account for approximately 80% of the CO_2 emissions associated with a typical portfolio as well as 15-25% of a typical portfolio in terms of asset value. The real estate, agriculture and forestry sectors, despite being highly relevant in terms of climate, are not covered on a global level due to a lack of available data and may be covered by other tools (notably real estate in Switzerland). R&D investments are also not covered.

Data Inputs

Portfolio Data. To run the portfolio assessment, participants provide an input file containing security information for each of the portfolios to be analyzed. It includes the following information:
   a. Either a unique identifier for listed instruments or the company name.
   b. Funds are identified by its ISIN. Securities in each Fund are included in the analysis.
   c. The market value of the financial assets held in the portfolio.
   d. The currency code corresponding to the market value.
   e. A time stamp of the portfolio.

Financial Data. Financial data from Bloomberg is used to assign securities to sectors and to link them to parent and subsidiary companies, as well as for sector classification analysis. This data is supplied by 2° Investing Initiative.

Asset-Level Data. The model sources, where possible, forward-looking asset-level data for key technologies in climate-relevant sectors from independent industry data providers. It thus bypasses backward-looking, corporate-level reporting. Asset-level data is sourced from the data providers listed in the following table. It is supplied by 2° Investing Initiative and updated on a quarterly basis where possible. The map below highlights an example of the individual data points for global coal-fired power plants.

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[2] In general, the method can be applied also for private equity investments in the respective economic sectors. But, the automatization of PE evaluation is not yet possible.
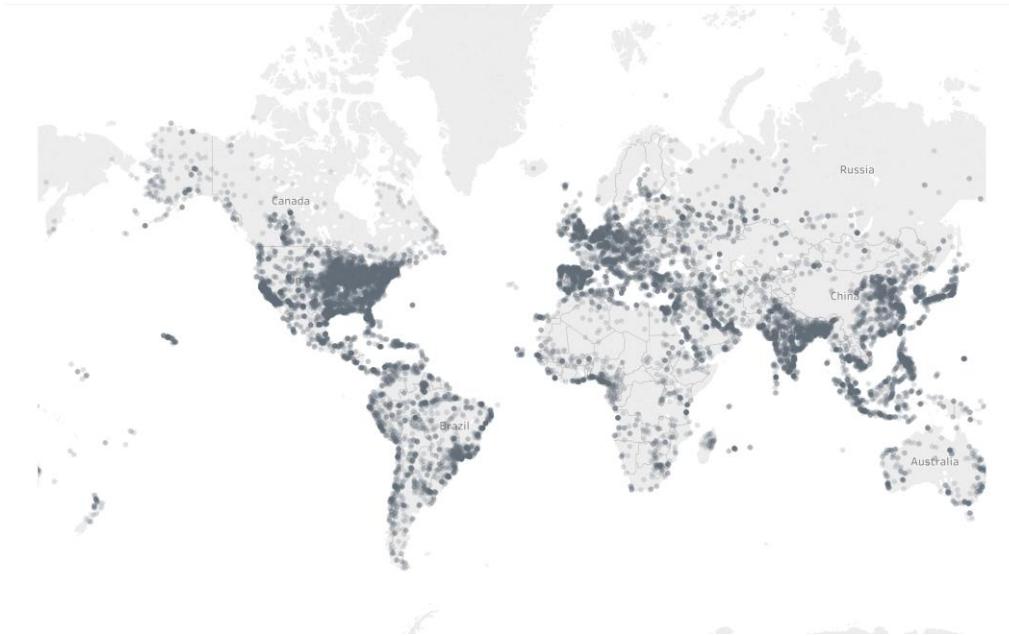
Data provider	Sectors	Key data points
GlobalData	Power, oil & gas, coal mining	a. Power plant data, including installed capacity, technology, status (i.e. announced, active, decommissioned, etc.). b. Oil and gas field data, including annual production volume. c. Coal mine data, including annual production mass.
WardsAuto	Automotive	Production forecasts for light duty vehicles.
RightShip	Shipping	Ship data, including ship type and GHG rating score.
FlightGlobal	Aviation	Passenger, cargo and combined aircraft data, including number of seats or tons transported, aircraft model, etc.
PlantFacts	Steel	Steel plant data, including production and CO2 emissions.
Cemnet	Cement	Cement plant data, including production and CO2 emissions.

Scenario Data. This analysis is based on the four climate scenarios developed by the IEA shown in the table below.

Scenario	Abbreviation	2100 temperature rise estimate	Source
Beyond 2° Scenario	B2DS	1.75°C	ETP 2017
Sustainable Development Scenario	SDS	1.7-1.8°C	WEO 2018
Stated Policy Scenario	SPS	2.7°C	WEO 2018
Current Policy Scenario	CPS	3.3°C	WEO 2018

These scenarios were selected for their high degree of granularity, extensive geographic and sectoral coverage, as well as for the compatibility of their indicators with the needs of 2°ii's analysis. In particular, the model uses the following indicators as basis for comparison to the portfolio:
   a. Power capacity by technology in megawatt (MW).
   b. Oil production in barrels per year.
   c. Gas production in billions of cubic feet per year.
   d. Coal production in tons of coal equivalent per year.
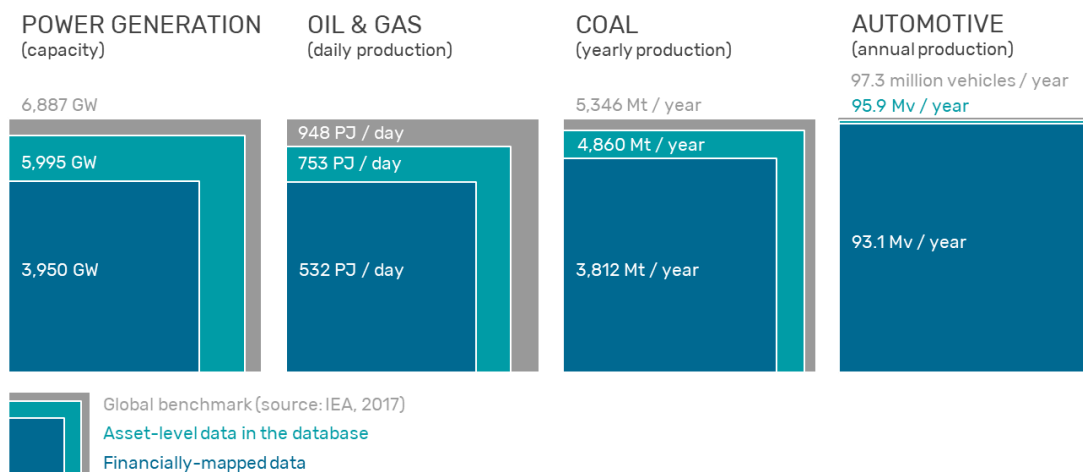   e. GHG emissions pathways in the aviation, shipping, cement, and steel sectors.

The figure below illustrates the distinction between "Current Trends", "Stated Policies Scenario" and the "Sustainable Development Scenario" in terms of CO_2 emissions reduction until 2050.

Energy-related CO_2 emissions and reductions in the Sustainable Development Scenario by source
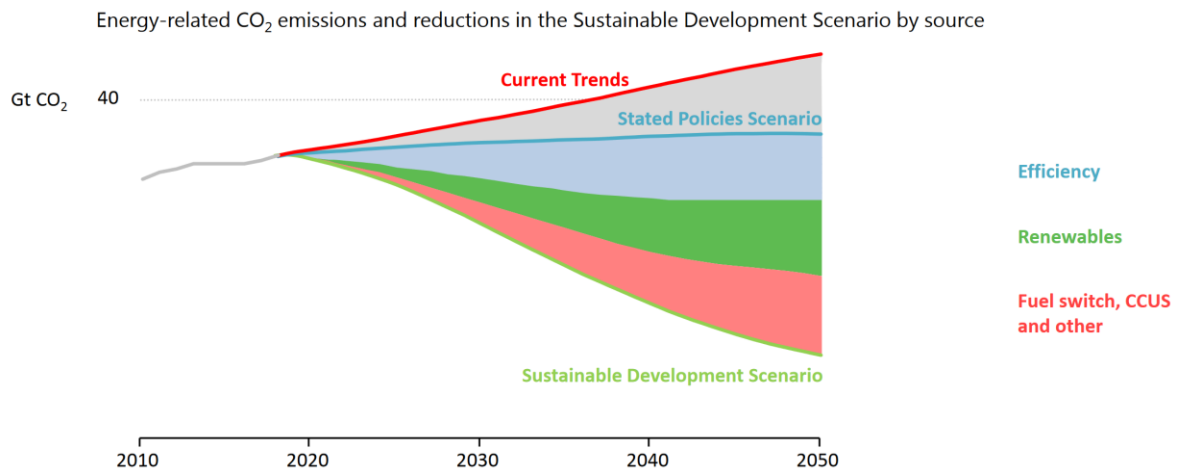
Technical Deep Dive: Asset-Level Data

The PACTA model is based on asset-level data across key climate-relevant sectors. 2°ii's data providers (see table on the previous page) source data on individual assets in climate-relevant industries using a variety of research capabilities, including web scraping, desk research, and direct engagement with industry. Forward-looking information is based on company investment and production plans that have been announced publicly.

These asset-level datasets cover more than 230,000 individual assets (e.g. individual power plants, oil fields, etc.), accounting for more than 75% of global carbon emissions. The following charts show the coverage of asset-level data relative to estimated global production figures—the global benchmark—for the power, oil & gas, coal, and automotive sectors. They also highlight the share of assets that have been mapped to financial data and are thus included in the analysis.

POWER GENERATION (capacity)	OIL & GAS (daily production)	COAL (yearly production)	AUTOMOTIVE (annual production)
6,887 GW		5,346 Mt / year	97.3 million vehicles / year
	948 PJ / day		95.9 Mv / year
5,995 GW	753 PJ / day	4,860 Mt / year	
3,950 GW	532 PJ / day	3,812 Mt / year	93.1 Mv / year

Global benchmark (source: IEA, 2017)
Asset-level data in the database
Financially-mapped data

Only the assets that have been mapped to financial data from Bloomberg are included in the analysis (the blue box in the charts above). This is because financial identifiers are required to link the asset-level production data to the portfolios provided by the participants.

The gap between the asset-level data coverage and the global production figures can be explained by non-corporate asset ownership, time lags in reporting, and errors in asset-level datasets. The discrepancy between the asset-level data and the financially mapped production figures exists because not all companies listed in the asset-level data have been matched with financial instruments in Bloomberg's financial data. 2°ii is continuously working to expand its matching capabilities, including with a text-string matching software and manual matching.

Provided that assets have been matched with financial data, production is allocated to companies, and further to financial instruments, based on direct ownership of assets and based on majority ownership of subsidiary companies that own assets. The result is a forward-looking production profile for each financial instrument that serves as starting point and basis of comparison for climate scenario analysis.

1.3 CURRENT TECHNOLOGY EXPOSURE

Research Question. What share of the portfolio is currently exposed to activities in sectors by the transition to a low carbon economy?

Metric and Methodology. This metric shows the estimated share of the portfolio that is currently exposed to companies operating assets in the fossil fuels, power, shipping, aviation, cement, steel, and road transport sector. It is calculated by first taking the weight of the portfolio that is exposed to companies in each of these sectors and then calculating the technology breakdown of assets owned by these companies (see figure on the right).
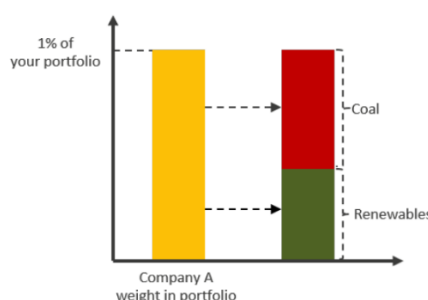
The portfolio's current technology exposure is compared to the market portfolio, which is calculated based on the exposure of the global universe of assets in the relevant asset class to the sectors, as well as to the peers participating in the tests.

Limitations. The sectors included in this analysis account for about 80% of the CO_2 emissions associated with a typical portfolio, and thus contribute significantly to a portfolio's exposure to climate risk. However, the metric does not cover sectors, such as the real estate, agriculture and forestry sectors, despite being highly relevant in terms of climate risk and impact, due to a lack of available data.

Sample Visual. This chart shows the estimated share of the portfolio that is exposed to activities in the power, automotive and fossil fuel sectors (*Note: The analysis extends to the other sectors described above)*, in comparison to the listed equity market. A value higher than the market portfolio suggests that the portfolio is currently more exposed to these activities than the market, on average. A value lower than the market portfolio suggests that the portfolio is less exposed to these sectors, all other things being equal. The analysis will also benefit from comparing results to peers.
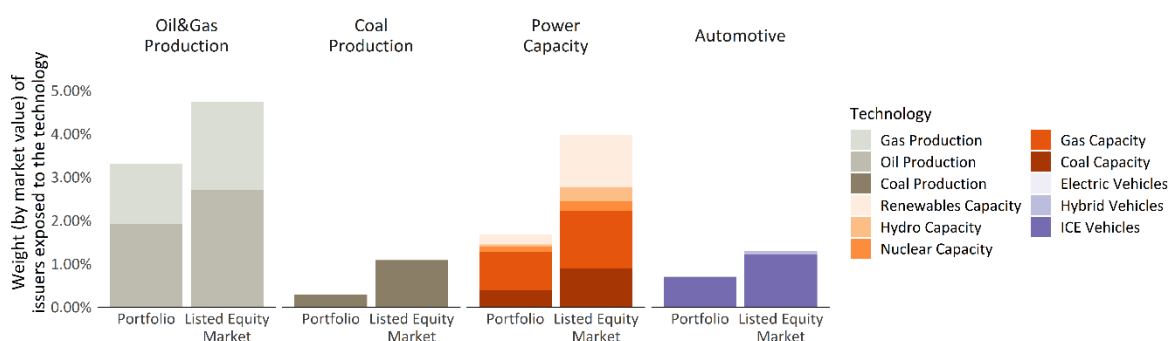
Use Cases.

- Manage exposure to climate-relevant sectors & technologies;
- Use information as inputs into climate stress-tests;
- Provide clarity to management and other stakeholders to what extent the portfolio is exposed to 'transition risk' and 'climate compatibility' issues;
- Reporting to external stakeholders.

1.4 5-YEAR TREND

Research Question. How aligned are the investment and production plans of companies in the portfolio with different climate scenarios and the Paris Agreement?

Metric and Methodology. This metric traces the portfolio's exposure to selected climate-relevant technologies relative to four IEA transition scenarios. The trajectory of the global listed equity or corporate bond market is also shown, as well as comparison to the peers participating in the 2020 project. It is forward-looking and compares the portfolio's expected production trajectories in different technologies to scenario-aligned trajectories over the next five years. The portfolio's expected trajectory is based on the underlying companies' investment plans for the next five years, while the market's trajectory is the combination of the current investment plans of all companies in the respective asset class for the same time period. The scenario-aligned trajectories represent the trajectories that would be expected if the companies in the portfolio were to develop according to the scenarios. They are calculated by applying the rates of change defined by the scenarios to the portfolio companies based on their respective market share (see next page for detail).

Limitations. The portfolio's expected trajectory is based on current revealed plans from companies and is subject to change. Thus, it should not be interpreted as a forecast, but rather as current plans 'frozen'. In fact, given the 5-year time horizon, it is likely that plans will change, which presents an opportunity to engage with companies on their investment plans. Similarly, participating financial institutions may alter their portfolio's composition over time.

Sample Visual. These charts trace the corporate bond portfolio's exposure to ICE vehicle production and electric vehicle production in comparison to the four climate scenarios (B2DS, SDS, SPS, CPS). The dashed line shows the expected development of the corporate bond market over the next five years based on current investment plans.
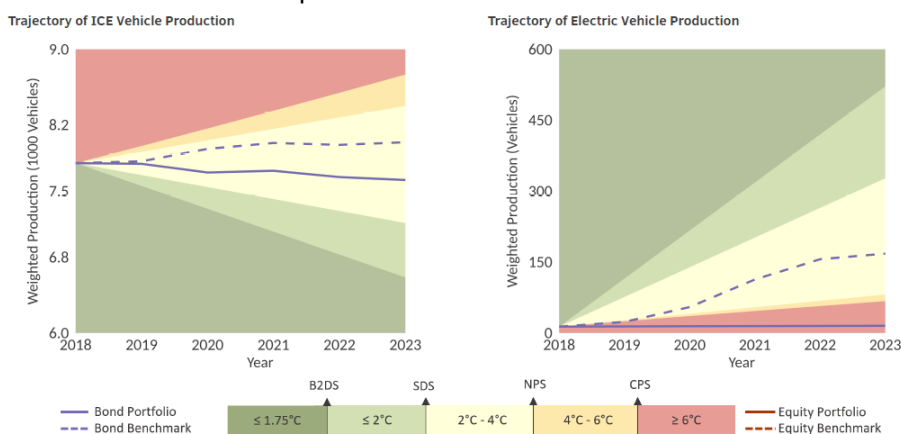
Use Cases.
- Input into target-setting approaches;
- Strategic insight into portfolio positioning relative to market, peers, and scenarios;
- Input into different climate actions (engagement, etc.);
- Indicator for climate goal alignment of financial flows from a policy perspective (implementation of Art. 2.1.c Paris Agreement);
- Reporting to external stakeholders.

Technical Deep Dive: ALLOCATING 'RESPONSIBILITY' FOR ACHIEVING (MACRO) CLIMATE GOALS TO COMPANIES / ASSETS (MICRO ACTORS)

There are 5 approaches that could be considered with regard to allocating economic assets / emissions to financial assets. Of these 5, only 2 currently have methodologies associated with them that can be applied in practice. Methodologies for the other 3 are currently under development. They won't be considered however in the 2020 analysis.

Market share approach: This approach uses a simple 'market share' allocation rule where all sector-level production and capacity trends are proportionally distributed across companies based on market share in the technology or sector. The market share is considered their share in the overall sector for low-carbon technologies, and their share in the specific technology for high-carbon assets. This different application is a result of the fact that taking the share in the sector for high-carbon technologies might lead companies to be required to retire assets they don't have, whereas taking the market share in the technology for low-carbon technologies may lead companies to not have to build out low-carbon technologies if their current market share is zero and thus inflates the responsibility of existing 'leaders'. This approach is currently used in the PACTA model.

Economic efficiency / least cost approach (under development): This approach uses sector-level output variables, such as demand and price, as a constraint interacting with the production costs of individual companies, arguing that the 'marginal' product is produced at the lowest cost. The cost approach uses the cost structure of a company's existing, planned, and potential capital stock to estimate which assets meet a sector-wide output constraint under the assumption that low-cost assets will be deployed first. This logic has been applied by the Carbon Tracker Initiative for oil, gas, and coal production and capital expenditure (CTI 2014; 2016). It will be integrated into PACTA in 2020

Historic responsibility (not applied): This approach allocates the responsibility based on 'historic contributions'. It represents a framework in particular in the context of climate litigation analysis in terms of liabilities for climate damages, but isn't considered currently in the context of alignment analysis. The logic will be applied in the litigation stress-test scenarios currently under development.

Bottom up approach (not applied). The bottom-up approach essentially mirrors the concept of equity and credit research analysts and considers a combination of economic and political factors, as well as adaptive capacity and corporate agility. This approach was applied by the CO-Firm in the context of the 2° Investing Initiative led ET Risk project, but is not part of the PACTA model, given the complexity to apply it at scale.

① Each 'company' / 'asset' gets allocated responsibility based on their 'market share'

② Each 'company' / 'asset' gets allocated responsibility based on 'economic efficiency' (i.e. least cost)

③ Each 'company' / 'asset' gets allocated responsibility based on 'historic responsibility'

④ Each 'company' / 'asset' gets allocated responsibility based on 'bottom-up' allocation involving a combination of factors (economic efficiency, adaptive capacity, political positioning)
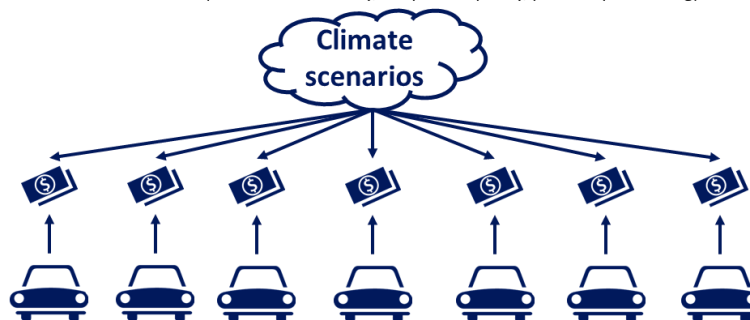
1.5 FUTURE TECHNOLOGY MIX

Research Question. What is the portfolio's technology mix in climate-relevant sectors expected to look like in five years based on current investment plans of the companies underlying the portfolio, and how does it compare to peers, the market, and a technology mix aligned with the Paris Agreement?

Metric and Methodology. This metric illustrates the portfolio's expected technology mix in the power, automotive, oil and gas, and coal mining sectors in five years. It is calculated by taking the portfolio's current exposure to each technology and then applying the trajectory of the exposure over time based on revealed investment and production plans, calculated in the previous step. That is, it represents the 2024 production values shown in the 5-year trend charts. The metric is compared to peers, the market, and a technology mix aligned with Paris Agreement goals.

Limitations. The portfolio's expected trajectory is based on current revealed plans from companies and is subject to change. Thus, it should not be interpreted as forecast, but rather as current plans 'frozen'. In fact, given the 5-year time horizon, it is likely that plans will change, which presents an opportunity to engage with companies on their investment plans. Similarly, participating financial institutions may alter their portfolio's composition over time (which indeed, may be one of the outcomes of the test itself). For simplicity's sake, it aggregates certain technologies and may not capture non-mature technologies.

Sample Visual. These charts show the portfolio's expected exposure to technologies in the power, automotive, and fossil fuels sectors in five years. The portfolio's future technology mix is compared to peers from the test, a scenario-aligned portfolio, as well as the scenario-aligned market.
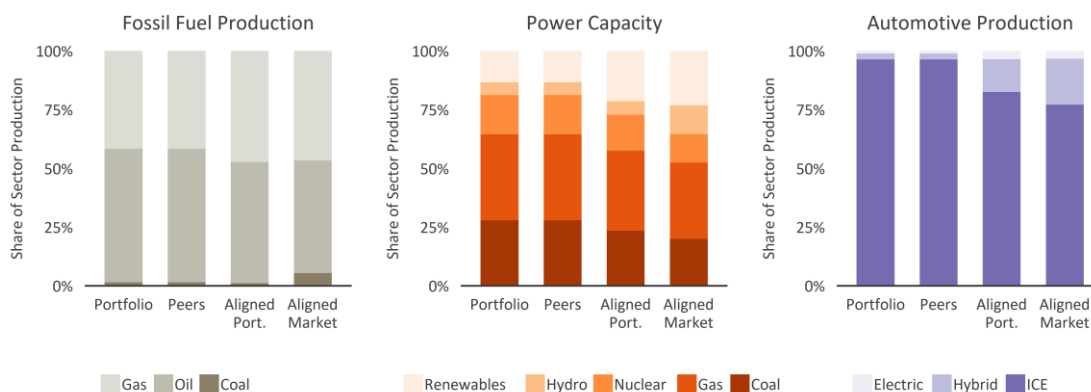
Use Cases.

- Management of concentration risks and portfolio diversification considerations;
- Input into target-setting frameworks and climate action strategies;
- Reporting to external stakeholders (Given that it is more intuitive to understand).

1.6 SWISS REAL ESTATE MODULE

Research Question. What are the CO_2 emissions of a building or an entire real estate/mortgage portfolio, how does it compare to peers and how aligned are the properties with the Swiss climate objectives for the real estate sector?

Metric and Methodology. The portfolio owner has to provide the location of the property in form of the EGID (Swiss Federal Building Identifier), an address or coordinates. The additional input factors (e.g. heating system, energy consumption area, refurbishment details) to calculate the CO_2-emissions for each Swiss property is complemented within the model, sourced directly from the Swiss Building and Housing Register and additional sources (e.g. Minergie, GEAK). Optionally the portfolio owner can supplement some of the additional input factors himself, if more current data is available. CO_2 emissions of each building in kg/m2 per year as well as for absolute CO_2 emissions per property per year are calculated in accordance with the Swiss SIA Standard 380/1.

The emissions per property can be compared with the average emissions of the specific building type (e.g. single-family house, multiple dwelling, hotel), of peers or with the emission reduction targets for the sector until 2050.

Limitations. The automatically used input data out of the Swiss Building and Housing Register may differ in accuracy depending on the geographic region and building type. It will be improved over time and can additionally be delivered by the portfolio owner if available. Within the model, power consumption is assumed as CO_2-neutral, consistent with the Swiss-produced power-mix. Energetic aspects, the materials used for building a property as well as recycling questions cannot be considered within this model. A discussion of monetary indicators (e.g. refurbishment costs) will be provided neither.

Sample Visual. The evaluation will take place according to different criteria (e.g. type of buildings, heating systems, regions). E.g. can two dates in time be compared, whereby the owner's strategy of refurbishment can be considered for the evaluation of the alignment with the Swiss emission reduction trajectory.
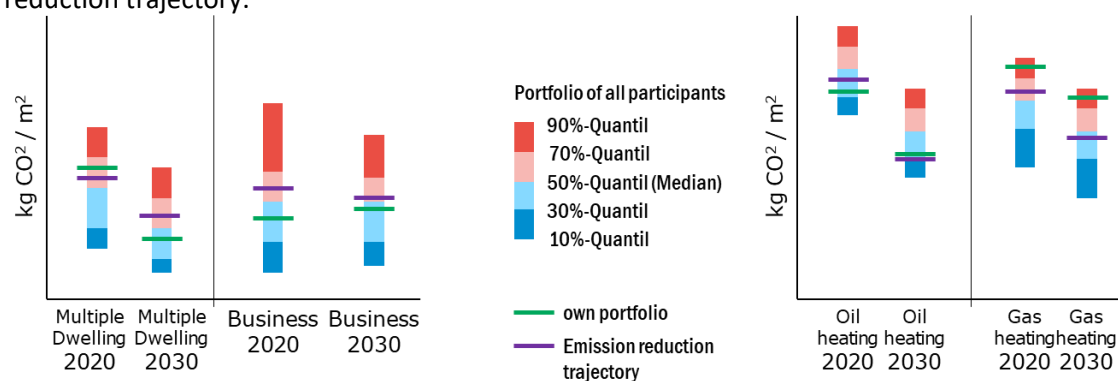
Use Cases.

- Input into target-setting frameworks and climate action strategies;
- Management of refurbishment concerns and risks;
- Reporting to external stakeholders

PART TWO:

STRESS TEST

2.1 OVERVIEW OF METRICS FOR STRESS TESTING

The second part of the analysis is a stress test, which quantifies the potential financial losses to an investment portfolio under different economic transition scenarios.

1

> **Research Question.** How will the value of the listed equity and credit (bonds / loans) portfolio change under different climate transition scenarios?
>
> **Metric.** The shocks quantify potential changes in the value of the portfolios for each sector under different economic transition scenarios.

2.2 COVERAGE AND INPUTS FOR STRESS TESTING

<u>Coverage</u>

Asset Classes. The stress testing framework covers listed equity, corporate bonds, and corporate loans.

Sectors. The analysis for physical risks covers all sectors (including those not covered by asset-level databases), for transition risk it covers the key climate-relevant sectors covered in Section 1. Litigation risk analysis is limited to the oil and gas sector.

<u>Data Inputs</u>

Portfolio Data. To run the stress test, participants provide the same input file as for the climate scenario analysis (see section 1).

Financial Data. Financial data from Bloomberg is used to assign securities to sectors and to link them to parent and subsidiary companies, as well as for sector classification analysis. This data is supplied by 2° Investing Initiative.

Asset-Level Data. The model sources, where possible, forward-looking asset-level data for key technologies in climate-relevant sectors from independent industry data providers. It thus bypasses backward-looking, corporate-level reporting. Asset-level data is sourced from the data providers listed in the following table. It is supplied by 2° Investing Initiative and generally updated on a quarterly basis. In addition to asset-level data, the model also relies on sectoral classification codes for those business activities for which it does not source asset-level data.

Data provider	Sectors	Key data points
GlobalData	Power, oil & gas, coal mining	d. Power plant data, including installed capacity, technology, status (i.e. announced, active, decommissioned, etc.). e. Oil and gas field data, including annual production volume. f. Coal mine data, including annual production mass.
WardsAuto	Automotive	Production forecasts for light duty vehicles.
RightShip	Shipping	Ship data, including ship type and GHG rating score.
FlightGlobal	Aviation	Passenger, cargo and combined aircraft data, including number of seats or tons transported, aircraft model, etc.
PlantFacts	Steel	Steel plant data, including production and CO_2 emissions.
Cemnet	Cement	Cement plant data, including production and CO_2 emissions.

Scenario Data. The underlying principle of the stress testing exercise is to apply different economic transition scenarios to an investment portfolio in order to quantify potential financial losses. This analysis is based on three transition scenarios detailed in the table below.

| Scenario	Description/Assumptions
Business as usual	This represents the baseline scenario assuming limited to no decarbonization.
Too late, too sudden	A delayed stress-test scenario materializing between 2020-2025, involving non-linear, non-cost-optimized outcomes
Smooth transition	A smooth transition achieving climate goals

2.3 STRESS TESTS

Research Question. How will the value of the your equity and credit (bonds, loans) portfolio change under different climate transition scenarios?

Metric and Methodology. The equity value shocks quantify potential changes in the value of the listed equity portfolio for each sector under different economic transition scenarios. The shocks are derived from existing climate stress-test scenarios co-developed by 2° Investing Initiative[3], including the Bank of England climate insurance stress-test[4] and the EIOPA climate sensitivity analysis (*forthcoming 2020),* as well as stress-tests developed by third parties.

Limitations. The application will only be able to apply sub-sectoral, granular shocks for those sectors for which asset-level data is available. The stress-test scenario for litigation risks is limited to the oil & gas sector and for physical risks is limited to sectoral shocks. The modeled stress-test parameters do not generally meet the condition of a 'general equilibrium model'

Sample Visual. The figure highlights the potential output of this analysis, showing losses for bond and equity portfolios, as well as potential 'positive' financial shocks related to low-carbon technologies (e.g. renewables). The results can be expressed in monetary units or % of portfolio losses and can be calibrated based on adjusting input assumptions, notably that of the 'start date' of the shock. In this particular visual for example, the start date is set to 2025.
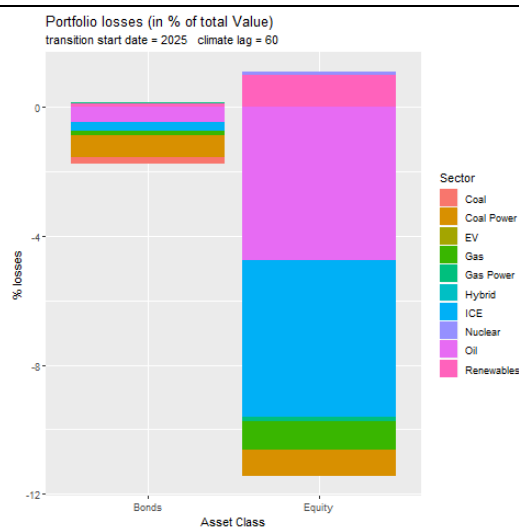
Use Cases.

- Climate-related reporting under the TCFD recommendations.
- Analysis of resilience of capital & liquidity under extreme climate outcomes.
- Basis of dialogue between financial institutions and financial supervisors, both at national level, and in context of the work of the Network for Greening the Financial System (NGFS)

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[3] https://2degrees-investing.org/wp-content/uploads/2019/02/Stress-test-report_V2.pdf
[4] https://www.bankofengland.co.uk/prudential-regulation/letter/2019/insurance-stress-test-2019

PART THREE:

IMPACT ANALYSIS

3.1 OVERVIEW OF METRICS FOR IMPACT ANALYSIS

The third part of the analysis is an impact analysis, which highlights climate actions taken by financial institutions to support emissions reductions in the real economy. It provides answers to a single question, corresponding to a metric included in the results of the analysis:

1

Research Question. What are the climate actions taken by financial institutions to support GHG emissions reduction in the real economy?

Metric. The qualitative analysis will involve providing results of survey data collected together with the portfolio data.

3.2 ANALYSIS OF ACTIONS

Research Question. What are the climate actions taken by financial institutions to support GHG emissions reduction in and foster a climate aligned transition of the real economy?

Metric and Methodology. The qualitative analysis will involve providing results of survey data collected together with the portfolio data. The following provides a sample, draft questionnaire as an example of the questionnaire provided for the application in 2020. The questionnaire will be analysed and reviewed, and the results will be presented together with the quantitative results. Over time, these two analytical components will be combined in the online test to show the potential impact of the actions on the targeted companies quantitatively.

The following is a sample draft questionnaire that highlights the type of questions considered in the qualitative analysis.

The purpose of this questionnaire is to establish the actions and associated objectives accompanying portfolio management and / or asset allocation strategies.
1. Which of the following actions did you take (*multiple answers possible*):
    * Engagement (Lead of Multi-investor dialogue only; Collaborator of Multi-investor dialogue only: Bilateral/private engagement only; Voting; multi-investor or annual general meeting (AGM);Resolution)
    * Divestment (*Please cite the scope of companies targeted by this action*)
        a. Coal companies (*please put percentage of business used as threshold, e.g. 30%, 50% and indicator used*)
        b. Fossil fuels (*Please describe methodology used to identify these companies*)
        c. Carbon Underground 100 / 200
        d. Other (*Please describe scope*)
    * Increasing 'green' investment
    * Political Engagement
    * Legal action
For each of the selected actions, please fill out the following questions:
2. Was this action coordinated with other FIs?
    * Yes (*please list organization or click other*)
        a. ClimateAction 100+
        b. Asset Owner Pledge
    * No
    * If yes: did you lead this action: yes/no?
3. What was the time period over which the action took place (*Start to finish date, if applicable*?)
4. (*Y/N)?*
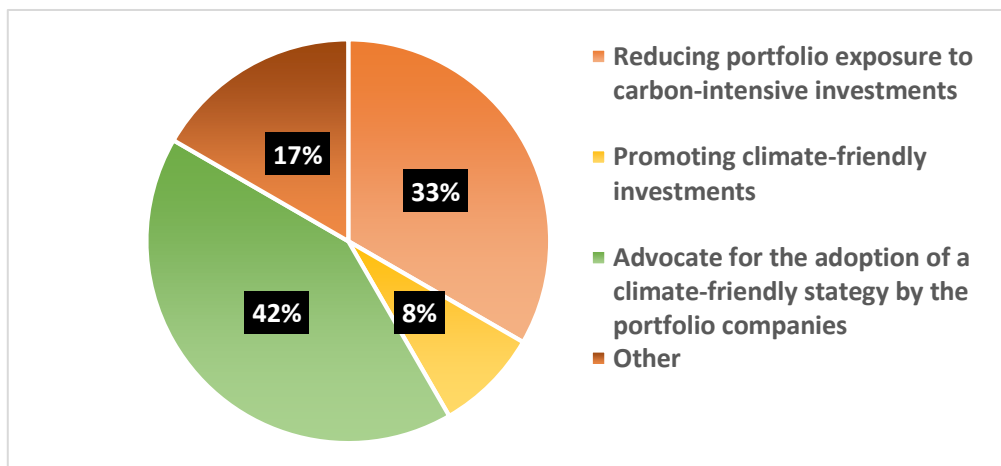5. *Was this action communicated publicly (Y/N)?*
6. What other resources were mobilized (e.g. data purchases, consultancy fees) and how much (*please list – if allowed – choice of service provider, cost, and scope (max 500 characters)*)?*
    * Data fees
    * Consultancy fees
    * Proxy voting fees
    * Membership fees in organizations
    * Other:

7. Did you record any specific outcomes of the action in financial markets (e.g. changes in cost of capital, availability of capital) (*Y/N)?*
8. What changes did you record (*Please list the company / set of companies for whom you identified the changes and provide evidence if possible)*
    - Cost of capital changes
    - Availability of capital changes
    - Other
9. Did you record any climate-related commitments from the targeted actors following your actions (Y/N)?
10. Did you record any changes in emissions / economic activity (Y/N)
11. If yes, what commitments / Changes (*please provide the company name for whom you have identified the commitments and evidence if possible)*?*
    - SBT
    - Shutting down emission intensive assets
    - Refurbishments & energy efficiency
    - Increasing investment in zero carbon technologies

Limitations. At this stage, the qualitative analysis cannot be directly matched to the quantitative analysis. Without historical data, impact of different actions cannot be analyzed in more detail. Even where historical data exists, the project will limit to identifying trends & changes at macro level.

Sample Visual. The following provides a sample visual of a survey of Swiss investors as to the climate actions they have taken.

Legend:
- Reducing portfolio exposure to carbon-intensive investments
- Promoting climate-friendly investments
- Advocate for the adoption of a climate-friendly stategy by the portfolio companies
- Other

Pie chart values: 33%, 8%, 42%, 17%

Use Cases.

- Complement quantitative analysis to create transparency on climate actions and the actions impact in the real economy on mitigation;
- Over time, monitor the efficacy of climate actions.

3.3 WHAT ACTIONS CAN I TAKE?

2° Investing Initiative and its partners are not regulated investment advisors, managers, or consultants and are thus not regulated to give financial advice. Moreover, the current evidence as to the effectiveness of one strategy over another is limited. More evidence-building is required, to which this project will hopefully contribute. To facilitate actions however, the briefing will involve an overview of potential actions taken by peers and individual case studies. 2° Investing Initiative will also launch a "Target-setting module" on the Transition Monitor Platform for participating financial institutions in this PACTA 2020 tests that they can use to set explore different strategies, develop climate actions and targets, and ensure alignment with external target-setting standards.

Ultimately, one of the objectives of this coordinated test round is to support climate actions in financial markets. This project will contribute to these actions by:

- Highlighting and **closing the potential gap** over the next 5 years between what is happening and what is required to reach sectoral decarbonization outcomes based on different scenarios. This can help structure actions that financial institutions can take to close that gap;
- Create a collective conversation that helps to **build evidence as to the effectiveness of climate actions** in terms of achieving emissions reductions in the real economy.
- Support the **learning from and collaboration between peers** on implementing climate actions.
- **Monitor progress** made with voluntary action taken by financial institutions.

The figure below provides a sample illustration of what the target-setting module will look like once implemented.