



TAKING THE TEMPERATURE
OF FINANCIAL ASSETS

1 Key results

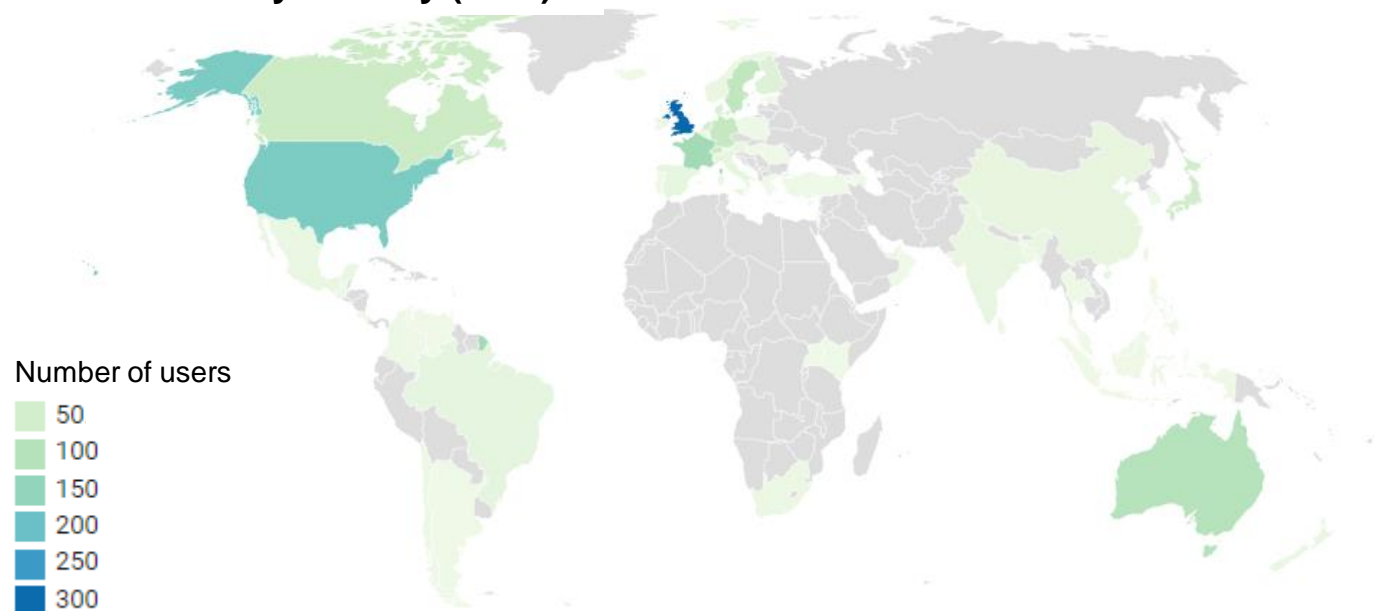
In September 2018, the 2° Investing Initiative (2°ii) introduced the **Paris Agreement Capital Transition Assessment (PACTA)** tool: a free software that calculates the extent to which corporate capital expenditures and industrial assets behind a given equity, bond, or lending portfolio are aligned with various climate scenarios. The first-of-its-kind software taps into a vast climate-related financial database, which covers more than 30,000 securities, 40,000 companies, and 230,000 energy-related physical assets.

Since the tool was launched on TransitionMonitor.org, nearly 2,000 individuals from more than 1,000 institutions have used it to conduct over 6,700 tests. Overall, the total assets under management of financial institutions using the tools amounts to more than USD 61 trillion.

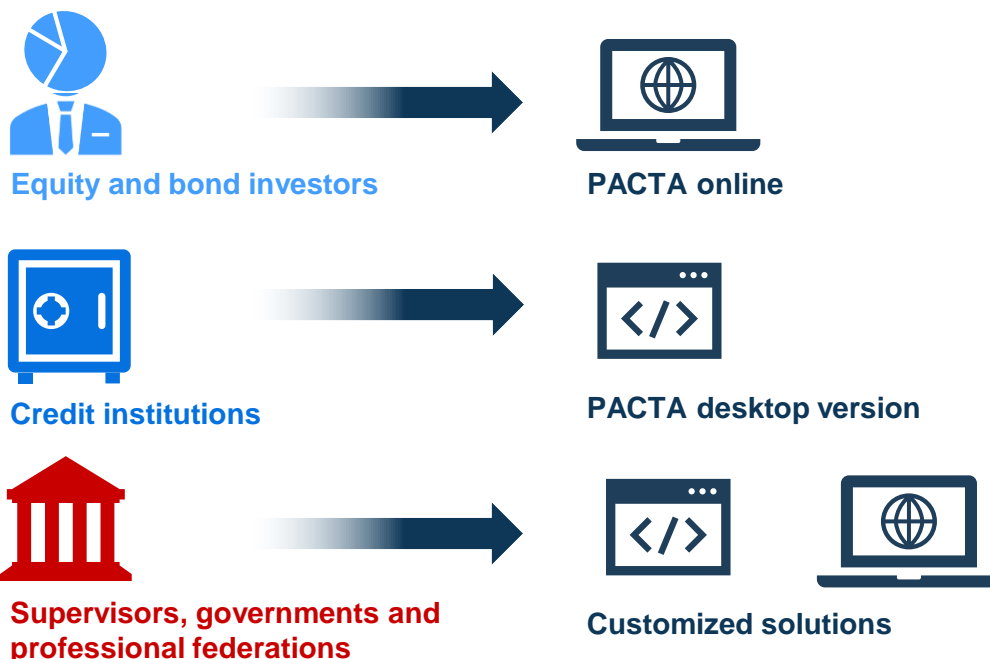
Key figures¹

- **1,700+** individuals from **more than 1,000** institutions have used the tool to conduct over **6,700 tests**
- **Nearly 900** FIs have used the tool to analyze more than **USD 61 trillion** in total AuM (*Cf. Table 1*)
- Users from **69+ countries** (including 36 developed and 33 developing countries)
- **30,000+** securities covered
- **40,000+** companies covered
- **230,000+** energy-related physical assets covered

PACTA users by country (total)



1 Key figures: the users¹



Group	Number of FIs covered	Total assets of the FIs ²
PACTA equity & bond users	879	> USD 43 trillion (<i>analyzed climate-relevant scope, based on typical ratios: approx. 8.6 trillion</i>)
PACTA lending users	17 signed up	USD 18 trillion (<i>analyzed climate-relevant scope, based on typical ratios: approx. 550 billion</i>)
PACTA – all FI users	896	> USD 61 trillion (<i>analyzed climate-relevant scope, based on typical ratios: approx. 12.2 trillion</i>)
PACTA supervisor and governments (<i>Swiss Federal Office for the Environment, a European insurance association, Federation of Colombian Insurers (Fasecolda), EIOPA, California Department of Insurance (CDI), & Dutch prudential supervisor</i>) ³	Approx. 2,600	USD 14 trillion (<i>analyzed climate-relevant scope, based on typical ratios: approx. 2.8 trillion</i>)

¹ Numbers in the table below are approximate, based on available data and subject to change

² This amount includes all of the assets of the financial institution (including asset classes not covered by the PACTA assessment like derivatives), based on publicly available data including <https://www.ipe.com/reports/special-reports/top-400-asset-managers/total-global-aum-2019/10031648.article>. It is not directly meaningful but i) it can be compared with the total assets of signatories to various pledges; and ii) it indicates the potential assets covered if PACTA is extended to other asset classes in the future.

³ Analyses with EIOPA and the European insurance association are still ongoing

2 Why did we create PACTA?

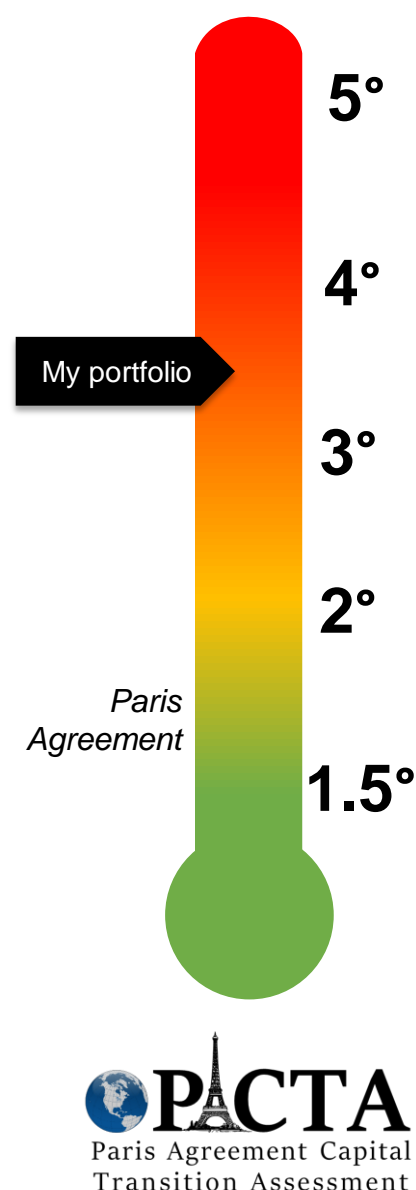
Until recently, investors lacked adequate information to perform climate scenario analysis on their portfolios, due in large part to the fact that companies often do not disclose details on their carbon emissions. This problem hindered their ability to align their portfolios with 2° benchmarks.

In response, following a 3-year road-testing and development phase, in September 2018 2°ii officially launched the free, open-source [PACTA](#) model and tool with support from **UN Principles for Responsible Investment (UNPRI)**, a UN-backed investor body.

The tool builds on a previous version that has been used by more than 250 investors, many of whom are PRI signatories, as well as four regulators, including the Swiss financial regulator and the California Department of Insurance. PACTA also builds on the outputs of two of our previous flagship projects: [Sustainable Energy Investment \(SEI\) Metrics](#) and [Energy Transition \(ET\) Risk H2020](#).

The tool analyzes the consistency / alignment of equity and fixed-income portfolios with multiple climate scenarios, producing a **customized, confidential output report**. It has an interactive feature that allows the user to **study the effects of different parameters on alignment**, for example by modifying the scenarios and geographies of the analysis. It uses graphs to help investors to **see the gap between their existing portfolio and 2° benchmarks**, as well as to compare themselves to their peers (e.g. other UNPRI members). It also features a stress-testing module that can be used by supervisors and their regulated entities.

The launch of the tool is another step towards supporting the goals of the **Task Force on Climate-Related Financial Disclosures (TCFD)**, a market-led initiative that is developing recommendations on climate-related financial risk disclosures. The tool aims to help investors comply with these recommendations, as well as related guidelines such as the **Article 173** of France's Law on Energy Transition for Green Growth and upcoming EU disclosure requirements.



3 Example outputs

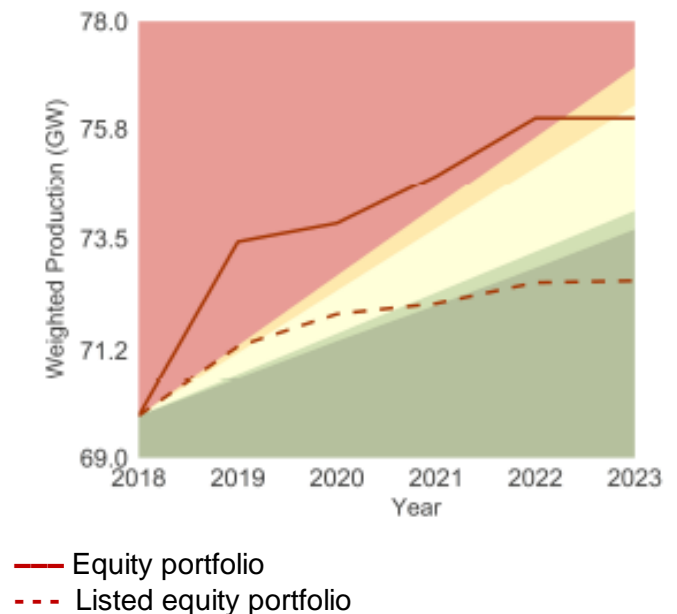
Weighted quantity of gas in a lender's portfolio

The rate at which the borrowers' production volumes are projected to change (at a 5-year horizon) is compared with the rates of change set as targets in climate scenarios, as well as to the rate of change of the entire industry.

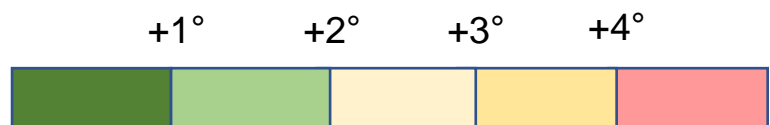
Following the market-share approach keeping market positions constant, all market players are required to adjust their production volumes at the same rate (relative to their size, i.e. same percentage).

The **gas-fired capacity financed by the example portfolio is increasing too much by 2023**; this portfolio is **not aligned**. The rate of change of the volume financed by this portfolio (solid line) is not on par with that of the market (dotted line), and higher than that required by scenario pathways.

Trajectory of Gas Power Capacity



Climate Scenarios

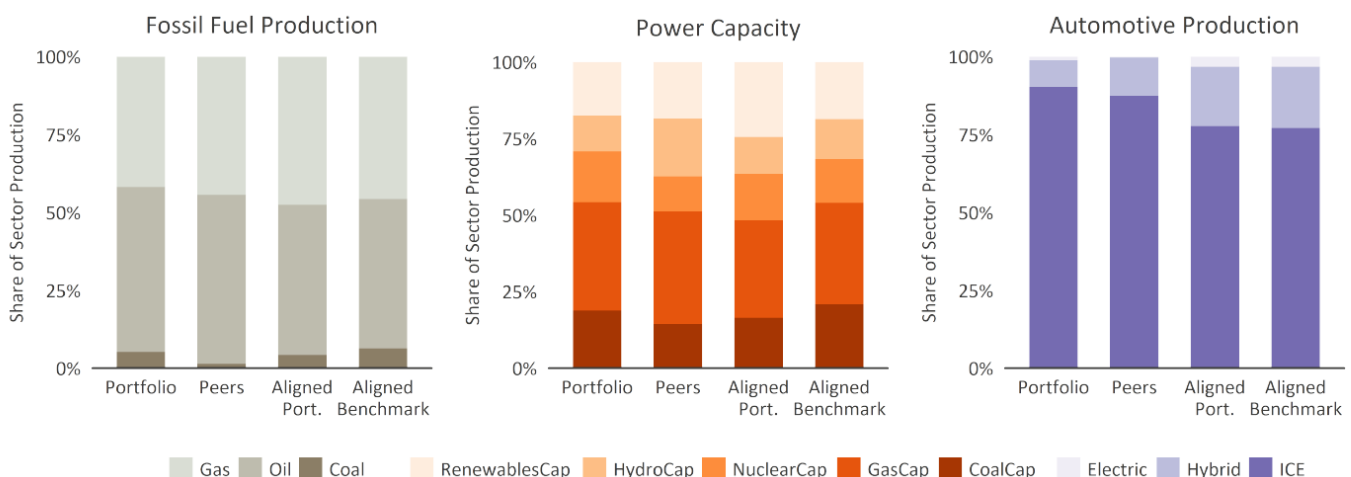


Energy mix in an investor's portfolio

This metric measures the **investor's relative exposure to the economic activities that are impacted by the transition to a low-carbon economy**. It is a function of how dispersed the investor's portfolio is across companies, and how dispersed these companies' activities are across technologies.

The example portfolio is under-exposed to renewables compared to the market portfolio. The metrics show that in a 2°C-aligned economy, all financial players' exposure to coal will have to decrease.

Equity



4 Enabling climate pledges¹

By coining the concept of “portfolio alignment with climate goals”, and introducing it into voluntary practices and public policies, 2^o Investing Initiative also helped empower a number of pledges and commitments that reached a peak at Climate Week NYC 2019.

The main pledges are summarized below. A majority of signatories use PACTA to analyze their portfolio.

Pledges & initiatives	No. of signatories (of which PACTA users / roadtesters)	Total assets (of which assets of PACTA users) ²
BANKS		
Katowice Group ³	5 (5)	USD 6 trillion (6 trillion)
Collective Commitment to Climate Action (CCCA) ⁴	32 (8)	USD 13 trillion (9 trillion)
Principles for Responsible Banking (PRB) ⁵	130 (17)	USD 47 trillion (18 trillion)
INVESTORS		
Net Zero Asset Owner Alliance ⁶	12 (12)	USD 2 trillion (2 trillion)
UN Principles for Responsible Investment (UNPRI) ⁷	2,699 (391)	USD 86 trillion (43 trillion)
INVESTORS AND BANKS		
PCAF signatories ⁸	55 (11)	USD 3 trillion (2.5 trillion)
COUNTRIES		
Enhancing transparency and aligning private financial flows with the Paris Agreement ⁹	9 (1)	Unknown (USD 298 billion)

¹ Numbers cited in the table are approximate, based on available data and subject to change. The table presents the total assets managed/owned by the users to enable comparability with the pledges that use this indicator. Our analysis only focuses on certain asset classes (corporate bonds, loans, and equities) and for those assets only analyses the alignment covered by energy technology roadmaps. The typical rate of assets analyzed is approximately 20% for equity, corporate bond, or corporate lending portfolios.

² In line with the methodology we used to calculate the assets behind the pledges, we accounted here the total assets of the financial institution using PACTA (using sources such as [S&P Global](#)), even if only a subset of these assets were covered by the assessment. This leads to an over-estimation of volume in both cases. The previous table put these figures in perspective.

³ <https://www.ing.com/Sustainability/The-world-around-us-1/Katowice-Commitment.htm>

⁴ <https://www.unepfi.org/wordpress/wp-content/uploads/2019/09/PRB-Collective-Commitment-to-Climate-Action-18.09.19.pdf>

⁵ <https://www.unepfi.org/banking/bankingprinciples/>

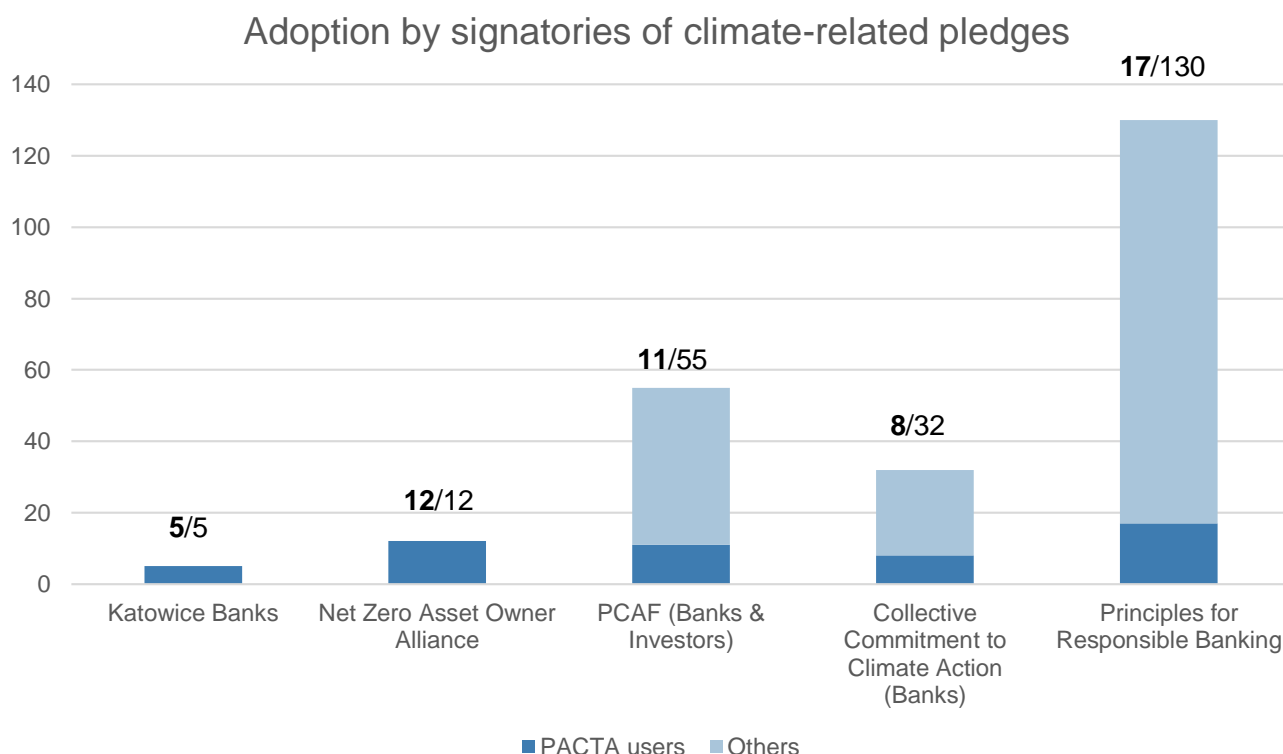
⁶ <https://www.unepfi.org/net-zero-alliance/>

⁷ <https://www.unpri.org/signatories>

⁸ <https://www.carbonaccountingfinancials.com/financial-institutions-taking-action>

⁹ <https://www.bafu.admin.ch/bafu/en/home/documentation/news-releases/anzeige-nsb-unter-medienmitteilungen.msg-id-76481.html>

4 Enabling pledges



“We are delighted to partner with the 2^o Investing Initiative on the launch of the PACTA tool. The PRI anticipates that this tool will help reduce information barriers for investors on how climate scenario analysis could be done. The launch of this tool, as well as solutions offered by other service providers, means there are even fewer reasons for investors not to get started.” – **Fiona Reynolds, PRI CEO**



“I congratulate the 2^o Investing Initiative and the PRI on the launch of PACTA – the free-to-use, online scenario analysis tool. Recognizing the uncertainty of the future policy and market pathway as it relates to the transition to a low-carbon economy, scenario analysis can highlight the extent to which a portfolio is exposed to this uncertain and associated risk, as well as the expected evolution to this exposure over time.” – **Dave Jones, California Insurance Commissioner**



“As investors like us take stock of the climate change-related risk and opportunities from companies we invest in, with regard to equities as well as corporate bonds, the open-source PACTA tool not only helps us understand how aligned we are with the global climate goals today but also provides a five-year trajectory. This informs us of how the investment decisions we make today will contribute to, or detract from, our ambition to steer the change required for a low-carbon and more sustainable future -- **Jean-Francois Coppenolle, Senior Manager at Aviva Capital, Aviva Insurance**



5 Uptake by investors

In order to promote PACTA, the 2^o Investing Initiative partners with the UN Principles for Responsible Investment ([UNPRI](#)), as well as with the investors' coalition [Climate Action 100+](#), to provide relevant data to support shareholder engagement. Most investors use the online platform anonymously, but others have chosen to disclose their results, publish their analyses, or share their comments publicly.

Case study: Handelsbanken

In 2018, Handelsbanken Asset Management (USD 60 billion in AuM as of Dec. 31, 2018) used the PACTA methodology to reassess their portfolios. The results of the analysis (right) show that their exposure to both high and low-carbon activities at the time was lower than the equity benchmark. Their total equity exposure to sectors included in the scenario analysis is below 2.5% and their exposure to oil, gas and coal production is below 1.5%.

After running the PACTA analysis, Handelsbanken initiated the following actions to develop their metrics and targets related to climate risks and opportunities:

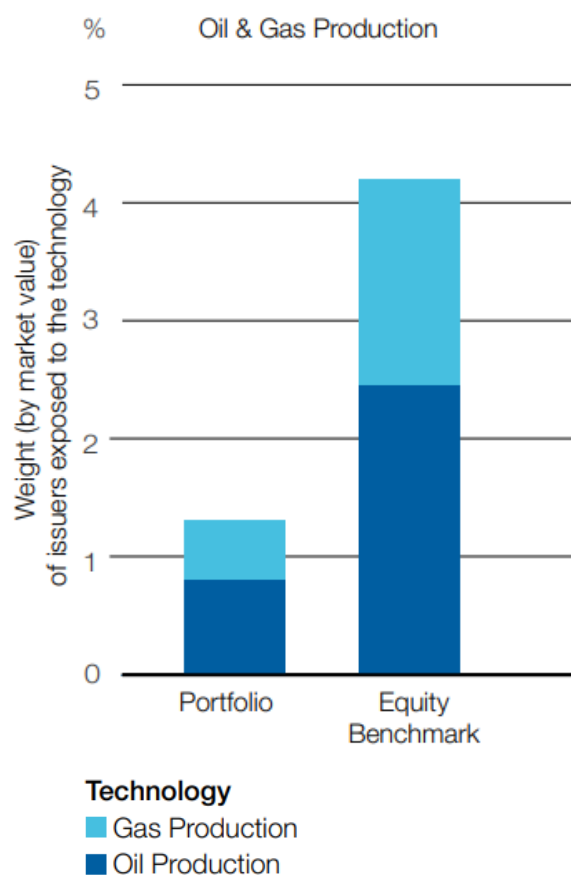
- Extend the transition risk analysis to include corporate bonds
- Develop methods for physical climate risk analysis
- Extend CO2 measurement to funds that are not yet measured – fixed income and multi-asset funds.
- Develop metrics and targets to follow up on investments in climate opportunities.

[For more information.](#)

Download examples of PACTA-based disclosures here: [Allianz](#); [ATP](#); [Australian Ethical](#); [Aviva](#); [Banque de France](#); [Handelsbanken](#); [Ircantec](#); [NN Group](#); [QBE](#); [Storebrand](#).



Sample: Current exposure of the equity portfolio to high-carbon and low-carbon activities, as a per cent of the portfolio, compared to the equity market



6 Uptake by banks

In 2018, 2^{oii} partnered with ING to extend the PACTA climate scenario analysis methodology to corporate lending portfolios. The new application represents a **major step forward for the banking sector**, providing users with insights into the climate impact of their clients' capital expenditure plans across the seven sectors the methodology covers. It employs a sector-based approach focusing on the economic activity resulting from owned assets of companies in the most carbon-intensive sectors. PACTA thus targets shifts in investment of companies from high-carbon to low-carbon technologies, empowering banks to steer towards a positive climate impact.

In February 2019, we began working with a pilot group of 17 international banks who will be road-testing the methodology, prior to releasing the public version in 2020. Together, the banks represent **three continents (Europe, North & South America)** and approximately **20% of the 100 largest banks worldwide in terms of AUM**.

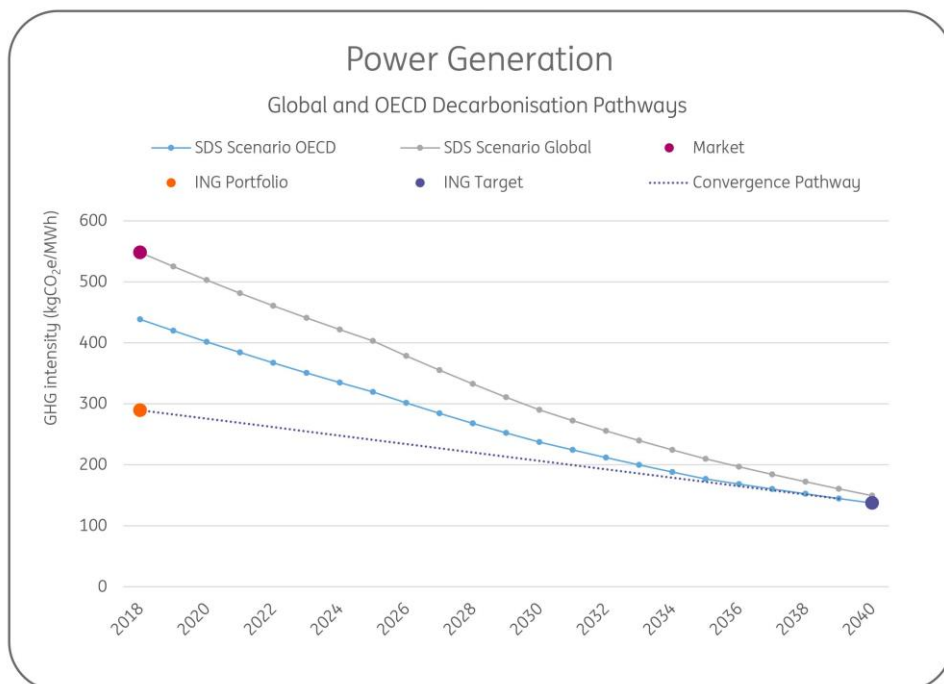
Case study: ING

On September 19, 2019, ING published its [first progress report](#) on Terra, its use of PACTA and other tools to steer its €600 billion lending book in line with the goals of the Paris Agreement.

With the Terra approach, ING aims to be a positive force in the fight against climate change. The progress report presents ING's pathway towards climate alignment in the sectors most responsible for climate change and is intended to be published every year.

Below: ING's power generation portfolio compared to the global market and the SDS scenario pathways

[For more information](#)



7 Uptake by financial supervisors

PACTA has also established itself as the leading model for financial supervisors and central banks to run scenario analysis and climate stress tests on the entities they regulate, notably in the insurance sector. First movers include the **Bank of England**, the **California Department of Insurance**, and the European Insurance and Occupational Pensions Authority (**EIOPA**). As a general rule, financial supervisors publicize the high-level results and send detailed reports to each insurer to inform their supervisory dialogue. These types of partnerships are also being extended to banking supervision. As of September 2019, AuM covered by the analysis totaled more than USD 14 trillion.

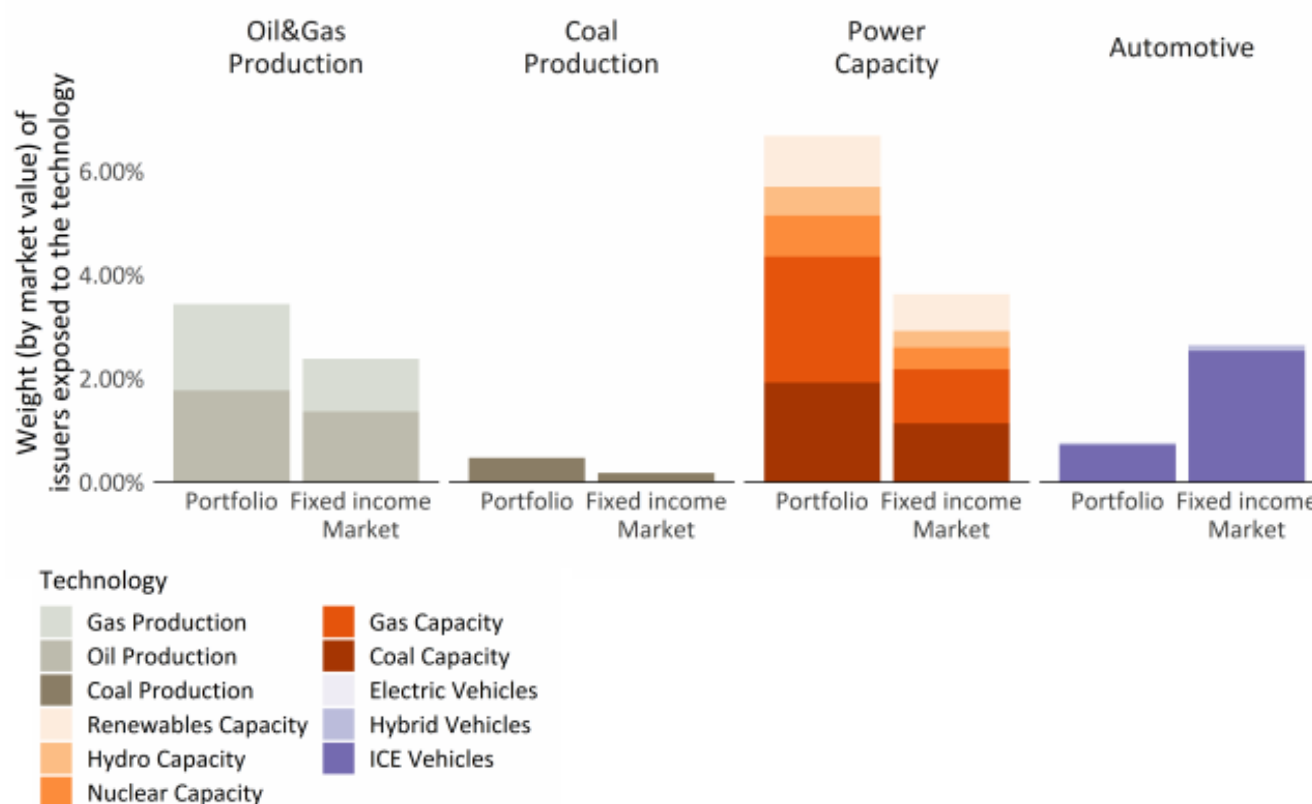
Case study: California Department of Insurance

2°ii has partnered with California Insurance Commissioner Dave Jones since 2016 to help determine climate-related risk to insurance industry investment. On January 4, 2019, the California Dept. of Insurance publicly released the [results of a new analysis](#) of the climate risk exposure faced by investments held by the insurance industry.

The climate risk scenario analysis prepared by 2°ii was the **first of its kind to include analysis of transition risks as well as physical risks (such as drought, floods, and forest fires) faced by insurers' assets**.

The analysis for the insurance sector reveals that insurers' assets continue to remain exposed to climate-related transition risks with the possibility of fossil fuel investments becoming stranded assets and that additional risks are faced by these assets due to climate-related physical impacts. For example, the analysis revealed that investments in coal-powered utilities are significantly exposed to wildfires and that a number of other assets in which insurers invest could be adversely impacted by water scarcity.

The figure below shows the estimated percent of the fixed income portfolio currently exposed to activities across the fossil fuel, power, and automotive sectors (compared to the fixed income market). [For more information](#).



8 Uptake by public authorities

In 2017, Switzerland became the first country to ask its domestic asset owners to analyze their portfolios with PACTA and share the results. During the first year of our collaboration, two-thirds of AuM were analyzed, with 40% of participants declaring that the analysis triggered climate-related actions.

Following the success of this engagement, ahead of the 2019 Climate Action Summit, Switzerland and the Netherlands launched a new initiative: calling on Member States and financial institutions to sign on to **a new pledge to assess and monitor the climate impact and alignment of their financial flows with the Paris Agreement's 1.5°C temperature goal.**

As part of this pledge, the next round of testing in 2020 will be coordinated with Denmark, Italy, Luxembourg, Norway, Portugal and Sweden, among other countries. The expanded model will then be available to asset managers and banks, in addition to Swiss pension funds and insurance companies. The aim will be to **cover at least 50% of the assets under management while striving for 100% portfolio coverage.**

[For more information.](#)

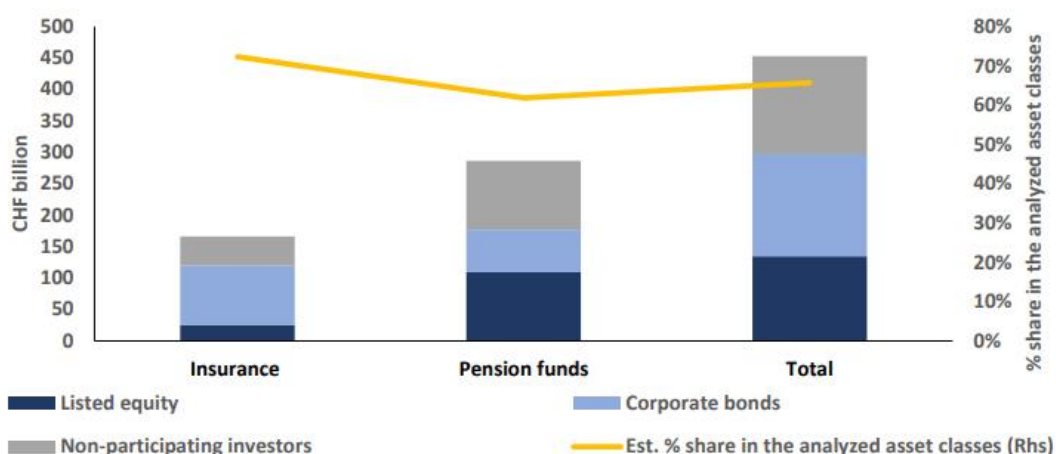
Case study: the Swiss Federal Office for the Environment (FOEN)

In 2017, recognizing the importance of the financial sector in the transition to a low-carbon economy, the Swiss Federal Office for the Environment (FOEN) and the State Secretariat for International Financial Matters (SIF) initiated a voluntary assessment of the alignment of Swiss pension funds and insurance portfolios with the 2°C climate goal.

79 pension funds and insurance companies, representing about two-thirds of the total market as measured by assets under management, used the PACTA methodology to test their portfolios for climate compatibility. The volume of the assets under examination and the participation of various sizes of pension funds and insurance companies made a representative analysis possible. The results showed that investments currently support global warming of 4 to 6°C. There are, however, great differences between individual insurance companies and pension funds. Some are already making climate-friendly investments, while others favour particular sectors or classes of investment. However, in other sectors, such as the expansion of renewable energies, the average investor tends to lag behind the world market. The tests may contribute to a further rethinking within the Swiss financial sector.

See our report "[Out of the fog: Quantifying the alignment of Swiss pension funds and insurances with the Paris agreement](#)", which summarizes the results of the anonymized metadata.

FIGURE 1 NEARLY TWO-THIRDS OF THE SWISS PENSION FUNDS AND INSURANCE COMPANIES IN THE COVERED ASSET CLASSES PARTICIPATED IN THE PILOT (Source: Authors)



9 Uptake by companies

2°ii's Company Reports Project targets companies in the utility and automotive sectors that form part of the [Climate Action 100+](#) (CA100+) target group, an investor initiative to ensure the world's largest corporate greenhouse gas emitters take necessary action on climate change.

Operationally, 2°ii is using PACTA to produce **company profiles, which provide a quantitative analysis of the alignment of the company's assets and investment/production plans with a range of climate scenarios**. The company profiles will be provided to partner investor coalitions (UN PRI, Institutional Investors Group on Climate Change, CERES, etc.), and integrated into the PACTA portfolio analysis tool.

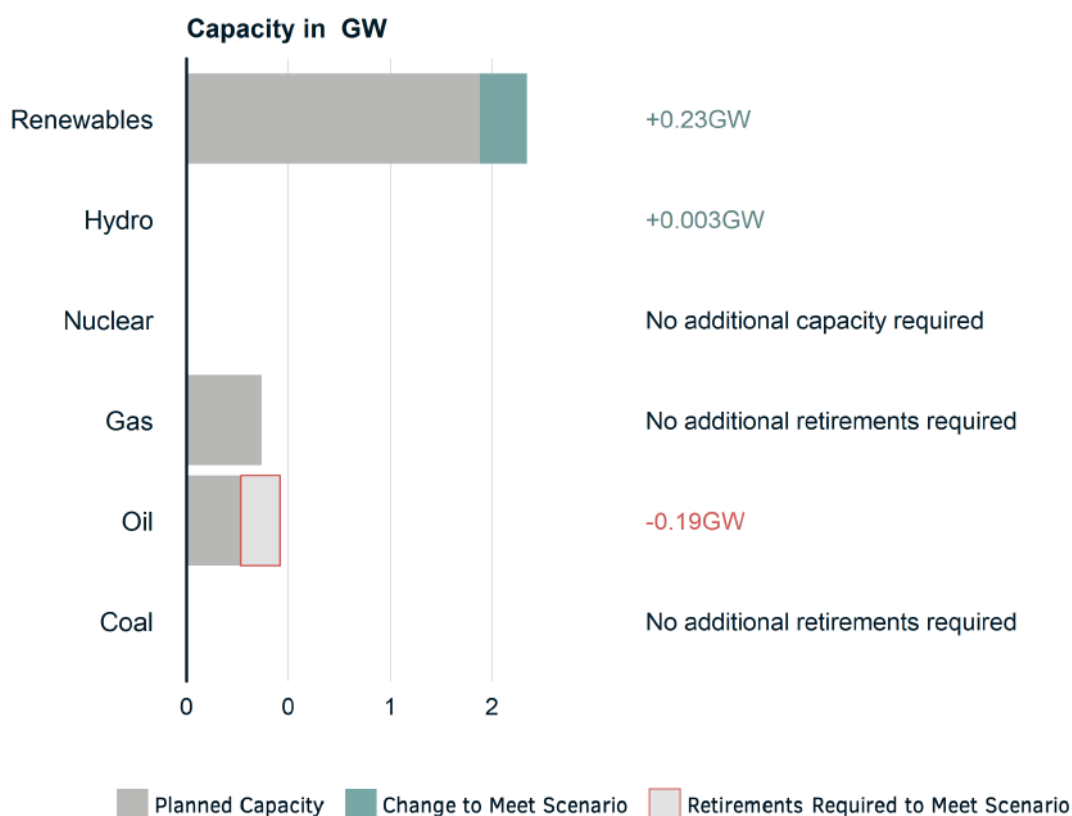
2°ii will then provide these companies' climate scenario analysis results to shareholders willing to engage on this topic. We will complement this work by engaging with policymakers, standard-setters and financial supervisors about climate-related metrics, benchmarks, and regulations related to disclosure on scenario analysis. Our overarching objective will be to ensure consistency between the practices pioneered with investors and the emerging regulatory framework on the topic, notably in Europe.

Case study: a large US energy company

In 2018, 2°ii worked with a major US energy firm to assess the following:

1. How its current energy mix compares to the overall power market's energy mix;
2. How its investment plans compare to different climate transition scenarios;
3. How its planned energy mix by 2023 compare to the scenario-aligned market;
4. How the company can adjust its investment plans to align with the SDS by 2023;
5. And how its climate alignment compares to other utilities in the North American market.

The findings from our analysis resulted in a comprehensive report (sample below), which will notably help the company define ways to align with the Sustainable Development Scenario (SDS) by 2023.



10 Uptake by civil society

In addition to our success with investors, banks, regulators and governments, we have also been engaging with a range of civil society organizations to build climate scenario analysis capacity.

Our most prominent partnership has been in the context of the **World Wildlife Fund (WWF) Asset Owner project**, involving the analysis of 33 large European asset owners' financial portfolios. The analysis covered USD 2 trillion in assets under management, with an estimated USD 300 billion in climate-related assets analyzed by PACTA.

The UK-based nonprofit, **Influence Map**, also leveraged data from PACTA for its flagship **Finance Map** project, a "forensic look" at the operators and shareholders of fossil fuel companies. The latest Finance Map report is available [here](#).



InfluenceMap



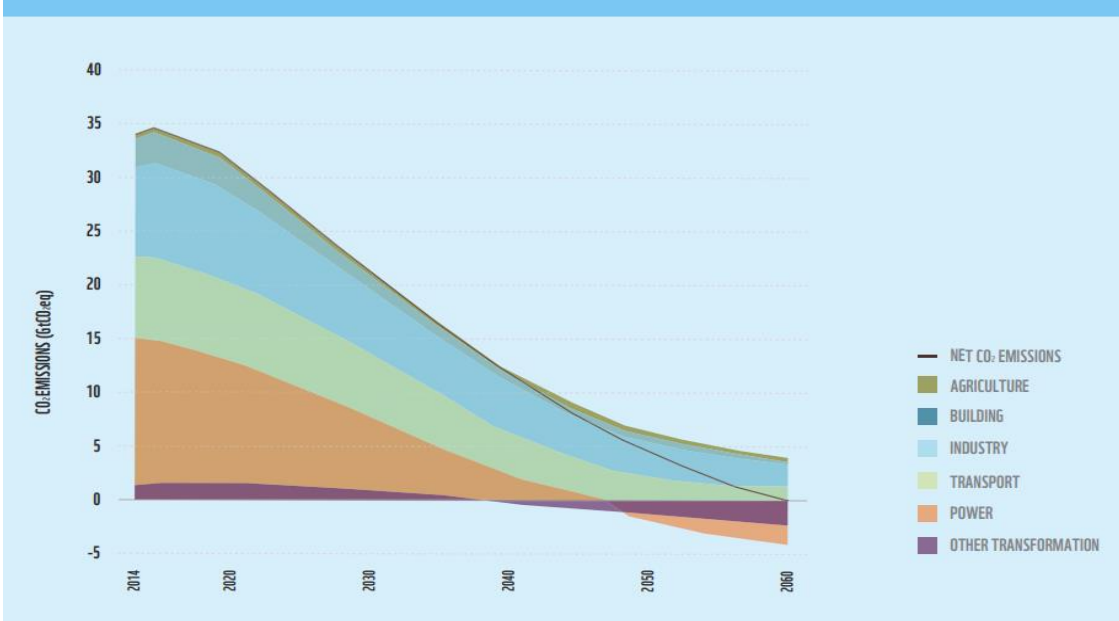
Case study: WWF

At COP24 in December 2018, WWF launched its report [European Asset Owners: Climate Alignment of Public Equity and Corporate Bond Portfolios](#). The report offers a forward-looking climate scenario analysis on how Europe's largest asset owners are aligning - or not - their public equity and corporate bond portfolios with the Paris climate goal of keeping global warming well below 2°C.

WWF identified the largest asset owners in 11 European countries and approached 88 of them to undertake a forward-looking climate scenario assessment. WWF applied PACTA for the forward-looking climate scenario analysis.

Result: 33 of the asset owners agreed to disclose their climate alignment results in this report for a set of key climate-relevant technologies: coal power, renewable power, coal mining, oil production and gas production. [For more information](#).

FIGURE 3. REQUIRED CO₂ EMISSION REDUCTIONS IN IEA 1.75°C SCENARIO BETWEEN 2014 AND 2060 (CARBON BRIEF)



11 Next steps: a suite of climate tools

Building on the success of the PACTA tool, the 2° Investing Initiative is also working on a next-gen, integrated platform that will offer a **full, enhanced suite of climate scenario analysis tools**. Financial institutions, as well as governments, regulators, and corporates, can use the platform to assess transition, physical, and legal risks at the market, sector, company and/or portfolio levels.

The platform will also feature stress-testing and target setting modules to empower financial institutions to refine their approach to risk analysis and to develop comprehensive decarbonization plans to contribute to the Paris Agreement goals.

Operationally, the platform will consist of the following capabilities:

Capital Markets Monitor, including:

- **A markets explorer** providing a top-down estimation of economic activity per sector, country & region
- The tracking new investment plans of non-financial firms in high carbon sectors
- Climate scenario analysis assessing transition, physical and legal risks
- Stress testing and evaluation of all regional markets to late & sudden scenarios
- Assessment and comparison of 30 regional and global equity and bond indices

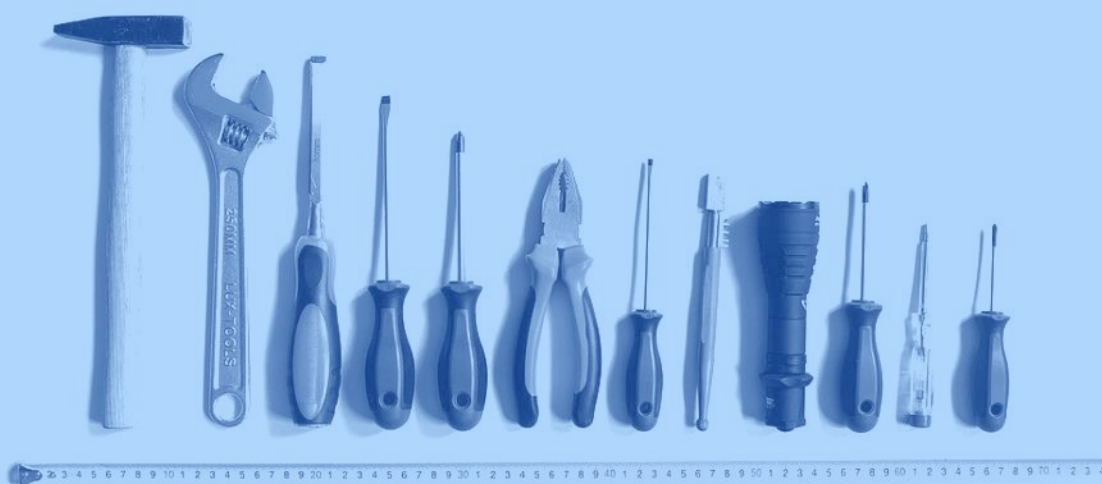
Market benchmarking tool, for running scenario analysis at market level

Company & Sector Monitor

- Building on a beta version that has already been tested on companies in the utility and automotive sectors that form part of the [Climate Action 100+](#) target group

Portfolio Assessment

- **PACTA**
- **Stress-Testing Explorer**, covering global equity and corporate bond markets and applying third-party stress tests e.g. Bank of England 2019
- **Target-Setting Tool** that will enable users to take meaningful decarbonization initiatives, by creating, monitoring and tracking implementing of structured climate action plans





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