Climate Action 100+ Net Zero Benchmark

Methodologies and metrics for assessing focus company capital alignment

October 2024

RMI

PACTA
Paris Agreement Capital Transition Assessment

Published by RMI´s Paris Agreement Capital Transition Assessment (PACTA) team

October 2023

For inquiries, please contact pacta@rmi.org

Website: www.transitionmonitor.com

About PACTA: PACTA is an approach and toolset designed to support financial sector actors to make scenario alignment measurements. It compares what needs to happen in climate-relevant sectors in order to minimize global temperature rises with financial institutions' exposure to companies in these sectors. It uses a dynamic, forward-looking approach, based on the 5-year production plans of companies in a financial institution's portfolio. PACTA has been used by over 1,500 financial institutions worldwide, as well as by supervisors and central banks to assess their regulated entities (e.g., European Insurance and Occupational Pensions Authority (EIOPA), New York Department of Fiscal Security, Bank of England, and more). On average, more than 600 portfolios are tested every month using PACTA.

PACTA was originally developed by 2° Investing Initiative (2DII) with backing from UN Principles for Responsible Investment. In June 2022, 2DII transferred stewardship of PACTA to RMI, formerly the Rocky Mountain Institute. Under RMI's stewardship, PACTA will remain a free, independent, open-source methodology and tool, and will continue to provide the financial and supervisory community with forward-looking, science-based scenario analysis to help users make climate-aligned financing decisions.

About RMI: RMI is an independent nonprofit, founded in 1982 as Rocky Mountain Institute, that transforms global energy systems through market-driven solutions to align with a 1.5°C future and secure a clean, prosperous, zero-carbon future for all. We work in the world's most critical geographies and engage businesses, policymakers, communities, and NGOs to identify and scale energy system interventions that will cut climate pollution at least 50 percent by 2030. RMI has offices in Basalt and Boulder, Colorado; New York City; Oakland, California; Washington, D.C.; Abuja, Nigeria; and Beijing.

Authors: Nayra Herrera, Nicholas Dodd, Antoine Lalechere, (RMI, PACTA team)

Contents

1. Scope of the CA100+ Net Zero Benchmark Alignment Assessments

To help investors drive engagement with companies that bolsters climate action, the Rocky Mountain Institute (RMI) uses the PACTA methodology [1] and data provided by Asset Impact [2] to provide analysis of companies in the utility, automotive, airlines, cement, and steel sectors that form part of the Climate Action 100+ focus list. RMI´s coverage of each sector for Climate Action 100+ is as follows:

- **Electric utilities:** 31 companies that generate electricity. Combined, these companies have more than 1.1 Terawatts in power capacity, representing around 14% of global power capacity.
- **Automotive:** 12 of the largest international automotive manufacturers. Combined, the companies are estimated to have produced around 54 million passenger vehicles in 2020 alone.
- **Airlines:** 5 commercial passenger airlines. In 2020 they operated routes and services reporting in total over 500.000 million revenue passenger kilometres[3].
- **Cement:** 11 companies. Combined they are estimated to produce over 700 million tonnes of cement, representing around 17% of global cement production.
- **Steel:** 7 companies. Combined they are estimated to produce 200 million tonnes of steel, representing around 11% of global steel production.

2. Alignment assessments based on the PACTA methodology

The Net Zero Company Benchmark alignment assessments provided by RMI are made using the PACTA (Paris Agreement Capital Transition Assessment) methodology. PACTA measures the alignment of economic activities in the highest CO_2 emitting sectors with climate goals, by comparing what needs to happen in these sectors in terms of decarbonization to what the companies in investor portfolios are planning to do in the coming 5 years. These Indicators and Metrics relate to and provide complementary information to Indicator 6 of the Climate Action 100+ Net Zero Company Benchmark Disclosure Framework.

The PACTA methodology consolidates and aggregates global forward-looking asset-based company-level data (i.e., what are the production plans of a specific manufacturing plant or power plant over the coming five years), based on third-party business intelligence providers up to the level of an ultimate parent company. The asset-based company-level data is prepared by Asset Impact using the data from these providers.

[1] The PACTA methodology was developed by the 2 Degrees Investing Initiative and the stewardship of PACTA was passed to RMI in June 2022. More about the methodology can be found here: https://pacta.rmi.org/

[2] Asset Impact https://asset-impact.gresb.com/

[3] Based on data published by the International Air Transport Association (2021)

The asset-based company-level data analyses companies' planned outcomes from capital expenditures (CAPEX) and the associated announced changes in production capacity or output for the coming 5 years, drawing upon a range of sources. The forecasts are backtested by data providers. This means that the planned capacity values are adjusted up or down based on each company's historical track record in realising planned production changes.

The forward-looking information provides investors with additional insights into the investment that companies are planning to fulfil their targets and achieve the goals of the Paris Agreement. The activities measured using PACTA also complement Indicator 6 of the Disclosure Framework (Capital Alignment) in the Climate Action 100+ Net Zero Company Benchmark.

The company alignment assessments are made using two main types of Metrics that are calculated based on the PACTA methodology:

- Technology level assessment: The first type of Metric is used for sectors that have clear technology roadmaps that allow for alignment to be measured for high-carbon technologies that need to be phased out and for low-carbon technologies whose deployment needs to be scaled up. This technology-level assessment is applied to the electric utility and automotive sectors.
- Emissions intensity-based assessment: The second type of alignment assessment is used for sectors that do not have clear technology transitions. Alignment is instead measured based on CO_2 emissions intensity, which is a technology-neutral metric that can reflect the contribution of a range of actions by companies to the decarbonisation of their production. This emissions-based assessment is applied to the steel, cement, and airlines sectors.

3. Technology level alignment assessments

RMI makes technology-level alignment assessments for the electric utility and the automotive focus companies. The technology level indicators are as follows:

- Company-level Planned Capacity Alignment With a 1.5°C Pathway (NZE): An aggregate of the technology level assessments for each electric utility and automotive company.
- Technology level assessments: Individual technology alignment assessments with several IEA scenario pathways for each electric utility and automotive technology.

In this section, the methodology used for each indicator is briefly described, together with the indicators themselves and how the results are graded.

3.1 The methodology used for technology-level alignment assessments

In order to measure alignment, each company's forecast production capacity per technology is compared to sector pathways to achieve climate goals developed by the International Energy Agency (IEA). Alignment assessments are made to scenarios that have the goal of stabilising average global temperature rise at varying levels by 2100, in comparison to pre-industrial levels. The current scenario set used is taken from the World Energy Outlook (WEO) 2023 which consists of three scenarios:

- Stated Policies Scenario (STEPS): This scenario is based on policies declared as of 2022 that aim to achieve the targets and objectives they have set out. If all the targets are achieved as set out by the policies modelled in the scenario, there would be at least a 50% chance of limiting global temperature rise to 2.4°C by 2100.
- Announced Pledges Scenario (APS): This scenario is based on the assumption that all current announced energy and climate commitments, both at international and national levels, are implemented. If all the commitments and pledges are realised as modelled in the scenario there would be at least a 50% chance of limiting global temperature rise to 1.8°C by 2100.
- Net Zero Emissions by 2050 (NZE): This is a normative scenario that is modeled to explore a market-driven, orderly transition to achieve net zero emissions by 2050. If the techno-economic transitions were to be realised as modeled in the scenario there would be at least a 66% chance of limiting global temperature rise to 1.5°C by 2100 with no overshoot.

For each scenario, the IEA has forecast the speed at which each technology must grow or decline for the world to meet different climate goals. The company baseline for the analysis is 2023 Q4, but the start year in the scenario is treated as 2023. A company's allocation of decarbonization according to each scenario is calculated based on the PACTA market-share approach. This means that the decarbonisation efforts are equally distributed amongst all companies in the sector. So, whilst each company's targets for their technology market share are calculated individually based on their starting point in 2023, the same required rate of change and proportional contribution to the increase in the sectors capacity or production is used, which is based on the trajectory in the scenario.

Using the PACTA methodology, all companies are required to contribute to the increase in low-carbon technologies, so even if a company has no renewable power capacity or no electric vehicle production in the period Q3 2022 to Q4 2023 a company-specific target will be generated in 2028 for the purpose of alignment measurement. Given the geographical and political specificities of investment in hydro and nuclear power generating capacity, companies that do not have capacity in these technologies in 2023 are not assigned targets to increase their capacity by 2028 in line with scenarios.

As well as being calculated for each technology the alignment results are aggregated to give a company-level result. This result is based on a weighted aggregate alignment across all technologies which is derived from the technology-level assessments. The weighting for the technology aggregate alignment is based on a combination of:

1. The company's technology mix if it were to be aligned with the scenario in 2028 (i.e., the relative importance of each technology to the company in 2028) and,
2. The proportional change in production capacity per technology required for the company to be aligned with the scenario in 2028 (i.e., the relative change in capacity per technology required of the company by 2028)

The weighting for each technology, therefore, takes into account the relative importance of each technology, both from the perspective of the company, with its specific technology mix, and the production capacity change per technology anticipated by each sectoral decarbonisation pathway.

3.2 The indicators provided for electric utility and automotive alignment assessments

Electric utility Indicator 1: Company-Level Planned Capacity Alignment With a 1.5°C Pathway (IEA NZE)

Objective of the Indicator*:* The company's 5-year power capacity plans for applicable technologies are consistent with the IEA's Net Zero Emissions by 2050 Scenario at an aggregate level.

This Indicator provides a binary assessment (aligned or misaligned) as to whether a company´s power capacity is aligned or not with the IEA NZE scenario pathway for the sector, measured on aggregate for the high and low-carbon technologies in their five-year forward production plans. This aggregate assessment for each company is based on the individual technology level assessments made by Sub-indicators 1.1 to 1.6, which are Coal, Natural Gas, Oil, Nuclear, Hydroelectric, and Renewables. The aggregate result for each company is calculated based on the percentage aggregate deviation from the sector pathway for the power sector and is graded as follows:

- Green: Aligned with NZE 1.5°C —The company´s 5-year production plans are aligned with the IEA´s NZE scenario (1.5°C) at an aggregate level.
- Red: Misaligned with NZE 1.5°C — The company´s 5-year production plans are not aligned with the IEA´s NZE scenario (1.5°C) at an aggregate level.

Electric utility Sub-indicators 1.1 -1.6: Technology Level Assessment

Objective of the Sub-indicator: The company's 5-year power capacity plans for each of the six power technologies is consistent with the IEA's Net Zero Emissions by 2050 Scenario.

The company-level aggregate result is supported by Sub-indicator results for the high and low-carbon technologies for which production capacity alignment assessments are made in each sector. The following grading is used for the assessment and is based on the use of the three IEA WEO 2023 scenarios that provide a pathway for the sector:

- Green: Aligned with or below the Net Zero Emissions by 2050 scenario (NZE <1.5°C)

- Amber: Aligned with the Announced Pledges Scenario (APS 1.5ºC -1.8°C)
- Red: Above the Announced Pledges Scenario (APS >1.8°C)
- Red: Aligned with or above the Stated Policies Scenario (STEPS >2.4°C)

Below are the applicable Sub-indicators, for each of which a grading is provided:

- **Sub-indicator 1.1:** Coal power planned capacity alignment

  The company's 5-year coal power capacity plans are consistent with the IEA's Net Zero Emissions by 2050 Scenario.

- **Sub-indicator 1.2:** Natural gas power planned capacity alignment

  The company's 5-year natural gas power capacity plans are consistent with the IEA's Net Zero Emissions by 2050 Scenario.

- **Sub-indicator 1.3:** Oil power planned capacity alignment

  The company's 5-year oil power capacity plans are consistent with the IEA's Net Zero Emissions by 2050 Scenario.

- **Sub-indicator 1.4:** Nuclear power planned capacity alignment

  The company's 5-year nuclear power capacity plans are consistent with the IEA's Net Zero Emissions by 2050 Scenario.

- **Sub-indicator 1.5:** Hydroelectric power planned capacity alignment

  The company's 5-year hydropower capacity plans are consistent with the IEA's Net Zero Emissions by 2050 Scenario.

- **Sub-indicator 1.6:** Renewable power planned capacity alignment

  The company's 5-year renewable power capacity plans are consistent with the IEA's Net Zero Emissions by 2050 Scenario.

Automotive Indicator 1: Company-Level Planned Production Alignment With a 1.5°C Pathway (IEA NZE)

Objective of the Indicator: The company's 5-year production plans for applicable technologies are consistent with the IEA's Net Zero Emissions by 2050 Scenario at an aggregate level.

This Indicator provides a binary assessment (aligned or misaligned) as to whether a company´s vehicle production is aligned or not with the IEA NZE scenario pathway for the sector, measured on aggregate for the high and low-carbon technologies in their five-year forward production plans. This aggregate assessment for each company is based on the individual technology level assessments made by Sub-indicators 1.1 – 1.3, which are Internal Combustion Engine vehicles (including mild hybrid technology), Hybrid vehicles (plug-in technology), and Electric vehicles. The aggregate result for each company is calculated based on the percentage aggregate deviation from the sector pathway for the automotive sector and is graded as follows:

- Green: Aligned with NZE (1.5°C) —The company´s 5-year production plans are aligned with the IEA´s NZE scenario (1.5°C) at an aggregate level.
- Red: Misaligned with NZE (1.5°C) — The company´s 5-year production plans are not aligned with the IEA´s NZE scenario (1.5°C) at an aggregate level.

Automotive Sub-indicators 1.1 - 1.3: Technology Level Assessment

Objective of the Sub-indicators: The company's 5-year production plans for each of the three vehicle technologies is consistent with the IEA's Net Zero Emissions by 2050 Scenario.

The company-level aggregate result is supported by Sub-indicator results for the high and low-carbon technologies for which production alignment assessments are made in each sector. The following grading is used for the assessment, which is based on the two IEA WEO 2022 scenarios that provide pathways for the sector:

- Green: Aligned with or below the Net Zero Emissions by 2050 scenario (NZE <1.5°C)
- Amber: Aligned with the Announced Pledges Scenario (APS 1.5°C -1.8°C)
- Red: Above the Announced Pledges Scenario (APS >2.4°C)

Below are the applicable Sub-indicators, for each of which a grading is provided:

- **Sub-indicator 1.1:** Internal Combustion Engine (including mild hybrid) vehicle planned production alignment.

  The company's 5-year Internal Combustion Engine (including mild hybrid) vehicle production plans are consistent with the IEA's Net Zero Emissions by 2050 Scenario.

- **Sub-indicator 1.2:** Hybrid (plug-in technology) vehicle planned production alignment.

  The company's 5-year Hybrid (plug-in technology) vehicle production plans are consistent with the IEA's Net Zero Emissions by 2050 Scenario.

- **Sub-indicator 1.3:** Electric vehicle planned production alignment.

The company's 5-year Electric vehicle production plans are consistent with the IEA's Net Zero Emissions by 2050 Scenario.

4. Emissions intensity based assessments

For sectors with no clear technology transitions, investors are encouraged to engage with focus companies on convergence with target CO_2 emissions intensities taken from climate scenarios. For the airline, steel, and cement focus companies, the alignment assessment is based on the improvement required to achieve convergence with the sectoral CO_2 emissions intensity in 2030 is calculated.

The assessment intended to inform engagements with investees on their involvement in the commercial scale-up of technologies and fuels is identified as being critical to achieving net zero in the IEA NZE sector pathways. The greater the distance between the company's current emissions intensity and the target for 2030, the greater the challenge for the company to align itself with the goals of the Paris Agreement.

5.1 The methodology used to assess the distance between a focus company´s current emissions intensity and the 2030 IEA scenario target

In order to obtain an emissions intensity value, the CO_2 emissions of each company in Q4 2023 are first normalised to either a unit of service for airlines or production for cement and steel. The percentage reduction in this emissions intensity value required to achieve the target value in 2030 taken from the scenario sector pathway is then calculated. The grading thresholds used for each sector are presented in table 3 below.

For all three sectors a longer 10-year timeframe to 2030 has been selected in order to better reflect the investment cycles and timing on which the first major plant upgrades and technology replacements identified in IEA scenarios will need to be planned. The scenario used differs by sector and is dependent on the availability of a sector pathway.

Table 3. 2030 scenario distance to alignment assessment gradings for airlines, steel and cement

Sector	Significant distance to alignment with the scenario (% reduction required)	Moderate distance to alignment with the scenario (% reduction required)	Approaching the scenario (% reduction required)
Airlines	>30%	15-30%	< 15%
Cement	>20%	5-20%	< 5%
Steel	>36%	15-36%	< 15%

5.2 The indicators used to assess the distance to alignment in 2030 of airline, steel, and cement focus companies

5.2.1 Airline distance to 2030 scenario target assessments

The airlines emissions intensity is calculated for passenger air travel. Asset-based company-level data on the fuel consumption performance and the annual flight distances (based on real flight data) for individual aircraft are used. The calculation of CO_2 emissions encompasses scope 1 direct emissions from the burning of aviation fuel.

The CO_2 data is first used to calculate the emissions for each aircraft in an operator's fleet, normalised to the passenger kilometres travelled and taking into account seat occupation[4]. The weighted average results for all the operational aircraft in a company's fleet are then calculated, with the weighting based on the annual passenger kilometres of each aircraft.

Indicator 1: Distance between the company's current emissions intensity and the IEA 2030 Scenario Targets

Objective of the Indicator: The company's current emissions intensity is approaching Paris-aligned IEA 2030 scenario targets

Results for airlines are calculated for Q4 2023. The emissions intensity is measured in g of CO_2 per revenue passenger kilometre flown. The figure of the company's Q4 2023 emissions intensity is made available in the downloadable results. For airlines, the IEA NZE (1.5 °C) scenario is used.

Scoring Options:
Yes, meets criteria: The company is approaching NZE (<15% reduction required)

Partial, meets some criteria: The company is a moderate distance from NZE (15-30% reduction required)

No, does not meet criteria: The company is significantly distanced from NZE (>30% reduction required)

Grey, Not assessed: Not applicable / Insufficient data

5.2.2 Steel distance to 2030 scenario target assessments

Steel emissions intensities are calculated per tonne of crude steel production. Crude steel production excludes rolling and casting steps. Asset-based company-level data for the steel sector is used to derive production values for each physical plant. As there is no technology shift or roadmap as such in current given climate scenarios, it follows that production values must be used to derive an

[4] A global average load factor (passenger occupation of seats on an aircraft) of 82% is used.

emission intensity per unit of production. The company-level emissions intensity is calculated as the weighted average of its production plant, with the weighting based on production capacity of each plant.

The calculation of CO_2 emissions encompasses scope 1 direct emissions from iron and steel furnaces, scope 2 indirect emissions from electricity used for processes including electric arc furnaces, and scope 3 indirect emissions associated with the production of hydrogen used in new processes for the production of both iron and steel.

Indicator 1: Distance between the company's current emissions intensity and the IEA 2030 Scenario Targets

Objective of the Indicator: The company's current emissions intensity is approaching Paris-aligned IEA 2030 scenario targets

Results for steel companies are calculated for Q4 2023. The emissions intensity is measured in tonnes of CO_2 per tonne of crude steel produced. The figure of the company's Q4 2023 emissions intensity is made available in the downloadable results. For steel the IEA Net Zero Emissions by 2050 (NZE) scenario is used.

Scoring Options:
Yes, meets criteria: The company is approaching NZE (<15% reduction required)

Partial, meets some criteria: The company is a moderate distance from NZE (15-36% reduction required)

No, does not meet criteria: The company is a significant distance from NZE (>36% reduction required)

Grey: Not assessed - Not applicable / Insufficient data

5.2.3 Cement distance to 2030 scenario target assessments

Cement emissions intensities are calculated per tonne of cement production. Asset-based company-level data for the cement sector is used to derive production values for each physical plant. As there is no technology shift or roadmap as such in current given climate scenarios, it follows that production values must be used to derive an emission intensity per unit of production. The company-level emissions intensity is calculated as the weighted average of its production plant, with the weighting based on production capacity of each plant.

The calculation of CO_2 emissions encompasses scope 1 direct emissions from calcining and from heating kilns, scope 2 indirect electricity use for processing cement from raw materials to final product, scope 3 indirect emissions associated with the production of hydrogen used for process heat.

Indicator 1: Distance between the company's current emissions intensity and the IEA 2030 Scenario Targets

Objective of the Indicator: The company's current emissions intensity is approaching Paris-aligned IEA 2030 scenario targets

Results for cement companies are calculated for Q4 2023. The emissions intensity is measured in tonnes of CO_2 per tonne of cement produced. The figure of the company's Q4 2023 emissions intensity is made available in the downloadable results. For cement, the IEA Net Zero Emissions by 2050 (NZE) scenario is used.

Scoring Options:

Yes, meets criteria: The company is approaching NZE (<5% reduction required)

Partial, meets some criteria: The company has a moderate distance from NZE (5-20% reduction required)

No, does not meet criteria: The company is significantly distanced from NZE (>20% reduction required)

Grey, Not assessed - Not applicable / Insufficient data