PACTA for Banks Scenarios

Formatted scenarios provided as part of the PACTA for Banks Toolkit

Date: 07/07/2021

Version: 1.2.0*

*Version control based on Semverdoc (https://semverdoc.org/) – older versions are available upon request from 2DII. Please request via banks@2degrees-investing.org

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1. Introduction

The PACTA for Banks methodology relies on the measurement of the alignment of climate-relevant sectors in a portfolio with decarbonization scenarios. Scenarios provide important insight into potential future decarbonization pathways that have the potential to achieve the scale of climate change mitigation required to limit the global temperature rise. Used in the context of PACTA for Banks they can help users understand their contributions to climate change but also, importantly, to develop strategies based on insight into the transitions and investments that will need to be made in the real economy.

PACTA for Banks is an open source methodology and as such is scenario agnostic, allowing for the use of any scenario. However, to be used in PACTA a scenario must have a sufficient level of data granularity. To overcome this issue and to allow users to get started using PACTA, 2DII provides a preselected set of third-party decarbonization scenarios prepared to be used with the PACTA for Banks Toolkit. The scenarios are formatted in such a way as to be read into the PACTA for Banks software.

Decarbonization scenarios are developed to meet specific carbon budgets and climate mitigation objectives. To do this they also rely on a series of modelling assumptions and expert judgements about possible futures. The set of scenarios provided in PACTA cover a range of climate change mitigation outcomes, but most importantly ones that look to achieve the goals set out by the Paris Agreement. They also reflect different assumptions and expert judgements about decarbonization pathways to reach these outcomes.

This document gives a brief introduction to climate change scenarios in general, a description of the scenarios included in the toolkit, and explains the methodology used to convert the scenario raw data from third parties' publications into scenarios ready to be used in the PACTA analysis. Note that this document should be read in conjunction with the PACTA for Banks methodology document, which is cited throughout. There is also a wide range of literature and guidance on the development and use of both climate and energy scenarios, to which this document only provides a starting point, and we recommend further familiarizing yourself with guidance and recommendations on how scenarios can be used.

The PACTA toolkit contains a collection of scenarios which can be used in the PACTA for Banks Software available at https://www.transitionmonitor.com/pacta-for-banks/.

2. Introduction to Decarbonization Scenarios

Climate change mitigation and transition scenarios, herein referred to as decarbonization scenarios, provide one possible pathway for the technology deployment and/or carbon emission that one or multiple sectors and the economy as a whole may follow to reach a targeted goal. These scenarios generally combine modelling of the energy sector, using energy system models (ESM) such as the IEA's World Energy Model (WEM)[1], and the economy as a whole, using Integrated Assessment Models (IAM)[2] to combine socio-economic, political and physical climate modelling to explore assumptions about how we will use and manage our energy resources in the future.

These decarbonization scenarios take as their starting point physical climate change models developed by the IPCC (Intergovernmental Panel on Climate Change) and other climate scientists. Physical models have been developed that anticipate a range of expected degrees of warming in the year 2100, with a statistical range from 7.8 degrees Celsius down to 1.0 degrees Celsius, each with their associated CO_2 concentration pathways and budgets. So when a PACTA for Banks user chooses a decarbonizaton scenario they are also choosing the underlying CO_2 budget that has been taken from physical climate change model.

The decarbonization scenarios provided as part of the PACTA for Banks toolkit look to translate macro-economic and sectoral carbon budgets into technology pathways for climate critical sectors. These pathways describe the scale and pace of change that would need to be achieved and, with varying degrees of uncertainty, the mix of technologies and investments required. Note however that for some sectors,

[1] WEO model document can be found here https://www.iea.org/reports/world-energy-model

[2] How are IAM used to study climate change: https://www.carbonbrief.org/qa-how-integrated-assessment-models-are-used-to-study-climate-change

technology pathways are not so well defined and hence carbon budgets can only be set at the sector level. This is the case for both steel and cement production.

3. How can scenarios be used?

Decarbonization scenarios provide potential future pathways to reach a certain goal (e.g. Paris Agreement targets). They do NOT claim to predict the future. As described in the Climate Scenario Primer,[3] 'Human-made climate change is driven by a myriad of societal factors over decades and centuries to come'. The future development of most of these factors is deeply uncertain and will be shaped by our actions. It is thus futile to ask, "What will happen?" and try to predict future climate change. But the future, while inherently uncertain, is not entirely unknowable.

Scenarios are important because they can be used to explore "What can happen?" and even "What should happen?" given the fact that we are able to shape our future. As has been highlighted by the Task Force on Climate-related Financial Disclosures (TCFD) they can allow us to 'challenge conventional wisdom about the future' given the scale and complexity of the changes required. But at the same time it is important to remember that:

1) these scenarios are not predictions of the future. Rather, they are depictions of what the future may look like.
2) there are different assumptions behind each scenario – assumptions can be related to socioeconomic, political or climatic factors and it is important to understand these when interpreting PACTA results.
3) PACTA is scenario agnostic, so any scenario or set of scenarios can be used to measure the alignment of a bank's portfolio. As PACTA aims to measure alignment to the Paris Agreement, it is imperative that at least one scenario used is "Paris aligned".

Picking up on the first point that scenarios are not predictions of projections of the future, it is important to have some basic considerations in mind when working with them. Box 1 below highlights five key pointers to bear in mind when using scenarios.

Box 1. Key pointers on how best to make use of decarbonization scenarios

The Financial Stability Board's TCFD recommends the use of scenarios as a tool to understand the strategic implications of climate change risks and opportunities for businesses, their strategies and their financial performance [4]. Their careful use can potentially inform activities such as disclosures, target setting, transition planning, capital allocation decisions and engagement with investees and counterparties that are misaligned or that have potential.

Scenarios should be used to '*enhance critical strategic thinking*' and importantly in order to *'challenge conventional wisdom about the future'* thereby allowing contrasting different possible futures to be analyzed. In particular they highlight the need for the scenarios selected to be:

1. Plausible. They should be based on a credible technical and socio-economic narrative.
2. Distinctive. They should allow for comparison between different combinations of influencing factors.
3. Consistent. They should have a strong internal logic and each action should have a reaction.
4. Relevant. They should each contribute specific insights into the future strategic implications of climate-related risks and opportunities.
5. Challenging. They should challenge conventional wisdom and explore alternative assumptions about the future.

Once a scenario has been selected, the Institute for Climate Economics (I4CE) emphasize the importance of correctly interpreting climate scenarios. They provide a framework for doing so, which they illustrate by

[3] The SENSES Toolkit, *Climate change scenario primer*, https://climatescenarios.org/primer

[4] TCFD, *The Use of Scenario Analysis in Disclosure of Climate Related Risks and Opportunities – Technical Supplement*, June 2017

applying it to a number of scenarios, including those of the IEA as provided as part of PACTA for Banks [5]. (see footnotes to read the full report)

By then comparing the outcomes from different scenarios with the same goal it is possible to be further informed about the possible future risks, uncertainties and opportunities [6].

All scenarios provided as part of PACTA for Banks contain a series of critical parameters and assumptions that define the key drivers and development pathways over the scenario's timeframe. Examples of the key assumptions behind a number of important scenarios are provided in Table 1.

When choosing to use a specific scenario for a sector or at portfolio level we recommend considering the following questions:

- What are your strategic objectives for climate change mitigation and on what time scale?
- Does the policy context in your country or region mean that certain scenarios are incompatible or not ambitious enough?
- Do you need to measure alignment at a global or regional level?
- Does the scenario cover the sectors you are interested in and is the scenario based on a credible and up to date technology roadmap for the sector?
- What is your position on the future role of certain technologies such as nuclear power generation, Carbon Capture Utilisation & Storage (CCUS), as well as the use of nature-based solutions such as forestry?

Because each scenario represents a certain view on how decarbonisation could take place, it is also recommended to compare the alignment trajectories given by different scenarios for the same sector. This will allow you to understand the sensitivity of different scenario decarbonisation pathways to certain key assumptions relating, for example, to the market take-up of new technologies such as electric vehicles or the assumed role of energy efficiency in reducing the energy intensity of industry. This in turn suggests a focus on the following further questions:

- For a given sector, by how much can assumptions for the contribution of energy efficiency vary between scenarios?
- For a given sector by how much can market assumptions for the growth in the production, sales or installation of new technologies vary between scenarios?
- To what extent would you like to identify opportunities to support technologies that are currently still under development?

4. The preselected scenarios

The majority of the scenarios provided by 2DII in the PACTA for Banks toolkit are developed by the International Energy Agency (IEA). A new IEA scenario has been added in the v1.2 release, namely the Net Zero 2050 scenario published in May 2021. In addition, a contrasting net zero scenario developed by a consortium of scenario developers on behalf of the Net Zero Asset Owners Alliance (NZAOA) has also been added [7]. The two new Net Zero scenarios contain some important differences in the modelling assumptions which we will highlight later in this section.

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[5] I4CE, *Understanding transition scenarios – eight steps for reading and interpreting these scenarios*, November 2019

[6] See the chapter in the Institut Louis Bachelier et al. (2020) *alignment cookbook* on choosing one or several scenarios and associated trajectories.

[7] The NZAOA commissioned the Institute for Sustainable Futures (ISF) at the University of Technology Sydney (UTS) to apply their One Earth Climate Model to specific high emitting sectors. The scenario documentation can be found here: https://www.unepfi.org/wordpress/wp-content/uploads/2020/12/OECM-Sector-Pathways-Report-FINAL-20201208.pdf

The IEA scenarios form part of two separate publications, the Energy Technology Perspective (ETP) and the World Energy Outlook (WEO). The Net Zero 2050 scenario forms an extension of the WEO 2020 and has its own supporting documentation [8].

The ETP covers the buildings, transport and industry sectors. In PACTA, it is used for industry and transport, namely the steel, cement and automotive sectors. It provides pathways with a time horizon from 2017 to 2060. In contrast, the WEO extends until 2040. It provides insight into the energy sector and its pathways for the fossil fuels and power sector are provided.

The IEA scenarios allow you to make a selection based on the overall strategic objectives for climate mitigation and the extent to which each scenario deviates from current climate change policies. The main differences are summarized below and in table 1. The table provides a comparison on the main fundamentals of the IEA WEO SDS Paris aligned scenario and the two new IEA and Institute for Sustainable Futures' Net Zero scenarios. It is advisable to read the full documentation and assumptions behind each model before making decisions based on alignment to the respective scenarios (links are provided below).

It is also important to note that it is not possible to access the raw data underlying the scenarios as part of the PACTA for Banks toolkit. Instead, you can access it though a paid contract with the International Energy Agency. The data underlying the IEA and Institute for Sustainable Futures net zero scenarios is, however, free to obtain.

Energy Technology Perspective (ETP) 2017

The Reference Technology Scenario (RTS): This is a baseline scenario that considers ambitions as reflected by current policies. This scenario misses the targets set in the Paris Agreement but is considerably better than a business as usual scenario. The RTS is most similar to the STEPS scenario in the WEO (discussed below). (IEA, 2017)

The 2 Degrees Scenario (2DS): This scenario sets out a rapid decarbonization pathway in line with the Paris Agreement. It is not as ambitious at the B2DS described below. If all the targets are achieved as set out by this scenario there would be at least a 50% chance of limiting global temperature rise to 2°C by 2100. This scenario is most similar to the SDS from the WEO described below. (IEA 2017)

The Beyond 2 Degrees Scenario (B2DS): Aims to limit with a 50% chance global temperature rise to 1.75°C above pre-industrial levels. This scenario does not necessarily follow the most economically efficient pathway. However, it does not depend on the breakthrough of unforeseen technologies. I.e. all technologies included in the ETP are already commercially available or will be within the time frame of the scenario.[9] The energy sector emissions reach net zero around 2060 which is achieved through a heavily reliance on bioenergy with carbon capture and storage. (IEA, 2017)

IEA, Energy Technology Perspective (2017)

World Energy Outlook (WEO) 2019

Current Policies Scenario (CPS): This is a business as usual scenario. I.e. it explores what the future may look like based on what is happening today and assuming no policy changes. In the CPS energy demand rises by 1.3% each year to 2040. (IEA, 2019)

Stated Policies Scenario (STEPS): This scenario incorporates policies declared today (2019). The goal with this is to assess what the world may look like in the future based on policies that have currently been announced. In contrast to the CPS, in the STEPS energy demand rises by 1% per year until 2040. More than

[8] IEA, Net Zero 2050, published May 2021 https://www.iea.org/reports/net-zero-by-2050

[9] Note that this is what the authors (i.e. the IEA) define as being breakthrough or unforeseen technologies. This is of course subjective so it should be noted as an assumption.

half of this growth in demand is met by solar photovoltaics (PV) while natural gas enabled by trade in liquefied natural gas (LNG) accounts for a third. Oil demand plateaus in 2030. Despite this, the global economic and population growth means that there is no peak in global emissions ahead of 2040 and hence globally shared sustainability goals (like that set out in the Paris Agreement) are missed. (IEA, 2019)

Sustainable Development Scenario (SDS) This scenario aims to meet stricter sustainable development goals. This requires rapid and widespread changes across all parts of the energy system. It is aligned with the goals set out in the Paris Agreement, with a 50% chance of limiting global temperature rise to below 2°C by the end of the century, as well as objectives relate to universal energy access and cleaner air. These efforts are shared amongst multiple fuels and technologies. (IEA, 2019)

IEA, World Energy Outlook (2019)

World Energy Outlook (WEO) 2020

In the 2020 update of the WEO there were updates made to the STEPS and the SDS scenario. There is no dedicated section on these updates as part of this document, but users of these scenarios are encouraged to look at the WEO 2020 scenario documentation. Note that the WEO 2020 SDS assumptions are documented as part of table 1 below.

IEA, World Energy Outlook (2020)

Net Zero Emissions by 2050 scenario (IEA NZ) 2021

This scenario extends the SDS in order to target net-zero emissions. The scenario responds to the increasing number of countries and companies that have made commitments to reach net zero emissions earlier combined with the aim of limiting the rise in global temperatures to 1.5°C by the end of the century (with a 50% probability). In particular it explores the actions needed in the period to 2030 in order to be on track to achieve net zero emissions by 2050, including the need to end new fossil fuel exploitation from 2021 onwards.

IEA, Net Zero by 2050 (2021)

Institute for Sustainable Futures Sectoral Pathways to Net Zero Emissions (ISF NZ) 2020

At this stage a dedicated section on the ISF NZ is not given. This scenario was created upon request of the Net Zero Asset Owners Alliance (NZAOA). . There is no dedicated section on these updates as part of this document, but users of these scenarios are encouraged to look at the ISF NZ scenario documentation. Note that the ISF NZ assumptions are documented as part of table 1 below.

ISF, Sectoral Pathways to Net Zero Emissions (2020)

Table 1. Comparison of the main modelling parameters and assumptions underpinning three main scenarios

The main scenario parameters and assumptions		IEA WEO 2020 SDS scenario	IEA Net Zero by 2050 scenario	ISF Net Zero scenario
Overall scenario targets	Average global temperature target in 2100	1.8°C	1.5°C	1.5°C
	Probability of limiting warming goal by 2100	66%	50%	66%
	Global CO_2 emissions [10]	27 Gt CO_2 in 2030 Net zero in 2070	21 Gt CO_2 in 2030 Net zero in 2050	12.2 GtCO_2 in 2030 Net Zero in 2050
	Cumulative global CO_2 budget for whole time frame (2020-2050)	790 Gt CO_2	460 Gt CO_2	450 GtCO_2
Coverage	PACTA sectors for which alignment can be measured	Fossil fuel, power	Fossil fuel, power, automotive (LDV)	Fossil fuel, power, cement, steel and aviation
	Geographical resolution	Regionalized pathway for power only. Global for Fossil fuel	Global pathway	Global, EU and North America, regionalized pathway for power only
	Time horizon and intervals [11]	10 year intervals through to 2070	10 year intervals through to 2050	5 year intervals through to 2050
Model uncertainty	Climate change mitigation scenario used	IPCC AR5	IPCC SR1.5	IPCC AR5
	Main identified sources of model uncertainty	Covid uncertainties, behavioral changes, CCUS for fossil fuels	Behavioral change, bioenergy, CCUS for fossil fuels	Behavioral change, large-scale deployment of renewables [12]
	Main assumptions on technology maturity	60-65% of required CO_2 reductions are from technologies currently commercially deployed.	50-60% of required CO_2 reductions are from technologies currently at demonstration or prototype stage.	Only considers theoretical technologies that have demonstrated proof of concept.
	Sectors or technologies for	Delayed Recovery Scenario, All	Behavioural changes, bioenergy,	-

[10] This represents the absolute CO_2 emissions target that needs to be achieved to maintain alignment with the scenario carbon budget in 2030 and 2050. These targets are taken from the carbon budget selected by the energy scenario developer. This carbon budget is generally based on a specific IPCC climate change mitigation scenario.

[11] To plot alignment trajectories a linear interpolation is made between the data points in the scenario. Ideally this should be for the 5-year time horizon but in some cases a 10 year horizon has to be used.

[12] This scenario specifically excludes or minimises the reliance on technologies with a high degree of uncertainty, specifically CCUS, large hydropower and nuclear power.

	which a sensitivity analysis is carried out	Electric Case (for road transport)	CCUS for fossil fuels	
Socio-economic assumptions	Global population	9.2 billion (2040)	8.5 billion (2030) 9.6 billion (2050)	7.7 billion (2030) 9.7 billion (2050)
	Economic growth (2020 baseline)	+3.0% per year (up to 2050)	+45% GDP (2020-2030) +100% GDP (2020-2050)	+100% GDP (2020-2050)
	Indirect/shadow carbon price	63$ tCO_2 (2025) 140$/$tCO_2$ (2040)	130$ tCO_2 (2030) 250$/$tCO_2$ (2050)	-
	Incorporates SARS-Cov-2 pandemic recovery assumptions?	Yes, integrated into economic growth and sectoral recovery assumptions	Yes, integrated into economic growth and sectoral recovery assumptions	2 base years included (one without COVID effect, and one with estimation of COVID effect) – not included in the projection
Energy model assumptions	Primary Energy demand reduction	17% less in 2030 compared to 2019	7% less in 2050 compared to 2020	8% less in 2050 compared to 2020
	Fossil fuel use and exploitation	Fossil fuel share in the primary energy mix falls around 70% by 2030	No new development or exploitation from 2020 onwards.	Emissions from fossil fuel must decline by more than half by 2030.
	The role of renewable energy	Renewable energy generation share increases from 30% in 2019 to 40% in 2030	Renewable energy generation is 60% of electricity supply by 2030	Renewable energy generation share increases from 30% in 2019 to 40% in 2025
	The role of nuclear energy	36% growth in nuclear capacity by 2040	76% growth in nuclear capacity by 2040	No new nuclear power stations
	The role of carbon capture utilization and storage	15% of cumulative reduction in CO_2 emissions. 2.9 Gt CO_2 after 2050	7.6 Gt CO_2 in 2050	No use of the technology
	Land use implications of bioenergy production	Small level of Bioenergy with carbon capture and storage (BECCS) is included.	+24% from 2020 to 2050	Bioenergy with carbon capture and storage (BECCS) is excluded
	Use of nature-based solutions for offsets	80-240 Gt CO_2 in 2050	No offsets assumed	152 Gt CO_2 in 2050

5. Methodology for converting the scenarios into PACTA input files

The following section covers how the data from the scenario developers is converted into input files as presented in the PACTA for Banks toolkit.

While the methodology to convert the scenarios into PACTA inputs are already defined, i.e. the use of the market share approach (see section 1.10 of the PACTA for Banks methodology document), for some sectors (steel and cement and automotive) 2DII has to make some assumptions in preparing the scenario files. These are documented below. It follows that a user may choose their own assumptions and can still use the scenario in PACTA given that the methodology set out in the PACTA methodology document is adhered to. Note that it is important that these assumptions are documented in the same way that they are here.

Power and Fossil Fuels

For these sectors, the technology roadmaps provided in the IEA WEO-2020 and the One Earth Climate Model (OECM) models are used in the PACTA for Banks Toolkit. The OECM is the model directly applied in the ISF NZ scenario for power sector. The market share approach is used to attribute the macro-economic decarbonization targets to micro-economic actors (companies, bank portfolios, etc.); the definition of the market varies between high carbon and low carbon technologies to ensure the approach solves for the global target and to ensure laggards need to do their share. Please refer to section 2.3 of the PACTA for Banks Methodology document for a full description.

Steel and Cement

For the steel and cement sectors, the preselected scenarios do not currently contain production volumes per technology in the same way that they are provided for the power, fossil fuel and automotive sector. They do however give absolute production and absolute CO_2 emissions at the sector level. In light of this PACTA draws upon a sectoral level metric to measure alignment - the emission intensity metric (detailed in section 2.4 of the PACTA for Banks methodology document). Note that this is subject to change as and when technology level production trajectories are made available.

The following section documents how the emission intensity scenario benchmarks are calculated for the IEA ETP 2017 and the ISF NZ 2020 scenarios respectively.

Calculating scope 1 emission intensity

For ETP

Material production (Mt) for both cement and crude steel are taken from the IEA scenario dataset. As are Scope 1 CO_2 emissions (Mt CO_2) for cement and iron and steel.

Scope 1 carbon-intensity targets in tons of CO_2 per ton of product for each given year are then calculated as follows:

$$\mathrm{I}^{\mathrm{in\ scope1}} = \frac{\mathrm{E}^{\mathrm{in\ scope\ 1}}}{\mathrm{P}^{\mathrm{in}}}$$

where "in" denotes the industry, "I" is emission intensity, E is absolute emissions (CO_2) and P is production.

For ISF NZ

In the case of the ISF NZ scenario scope 1 emissions are calculated as follows:

$$Emission\ Intensity = \frac{\sum_{technology} Emission\ intensity_{technology} * Market\ share_{technology}}{Production\ of\ steel}$$

Calculating scope 2 emission intensity

For ETP

To calculate scope 2 emission intensities two inputs are needed:

- The total electricity consumption of the sector being assessed
- The emission intensity of the power sector

The emission intensity of the power consumed is calculated using the absolute CO_2 emissions as well as the gross electricity generation of the power sector:

Both the direct CO_2 emissions (in Mt CO_2) as well as the gross electricity generation (in TWh) for the power sector are provided by the scenario developers. With these two inputs the emission intensity (g CO_2 /MWh) for the power generation is calculated as follows:

$$I_{power}^{in\ scope\ 1} = \frac{E_{power}^{in\ scope\ 1}}{P_{power}^{in}}$$

Scope 2 absolute emissions for the steel and cement sector are then calculated by multiplying the electricity consumption of the respective sector by the power sector emission intensity:

$$I^{in\ scope\ 2} = \left(\frac{EC^{in}}{3{,}600} * \ I_{power}^{in\ scope1}\right) * 1{,}000$$

where dividing by 3,600 is converting Joules to Mega Watt hours

For ISF NZ

In the case of ISF NZ, to obtain the scope 2 emission intensity per unit of output for each sector the absolute scope 2 emissions are divided by the material production:

$$I^{in\ scope\ 2} = \frac{E^{in\ scope2}}{P^{in}}$$

Combining scope 1 and scope 2 emissions

Finally, to obtain scope 1 and 2 emission intensity targets for the respective sectors the sum of both scope emission intensities is computed as:

$$I^{in} = I^{in\ scope1} + I^{in\ scope2}$$

Automotive Sector

Light Duty Vehicles

The PACTA methodology measures alignment in the automotive sector based on the technology mix and production-volume trajectory metrics described in section 2.2 and 2.3 for the PACTA for Banks Methodology document, respectively. As both these metrics are predicated on the production of vehicles, which is what is known at the asset level from the PACTA for Banks data set, it follows that the same production unit is needed from scenarios. Vehicle sales are assumed to be a more accurate proxy for vehicle production values than stock. Hence when stock is given in a scenario a conversion must be made to sales. The following sections describe how the sales assumed to be “production” values per technology are derived from the IEA-ETP-2017 and IEA-NZ-2021 scenarios respectively:

The **IEA-ETP-2017** scenarios required change from stock to sales is calculated as:

(all changes ($\Delta_{\mathrm{t1-t0}}$) are calculated over a 1-year time horizon)

$$\Delta_{\mathrm{t1-t0}} sales^{ETP2017} = \Delta_{\mathrm{t1-t0}} stocks^{ETP2017} + retirements^{ETP2015}$$

where retirements are calculated from the ETP 2015 as follows:

$$retirements^{ETP2015} = \mathrm{sales}^{\mathrm{ETP2015}} - \Delta_{\mathrm{t1-t0}} \mathrm{stocks}^{\mathrm{ETP2015}}$$

It the case of the IEA-NZ-2020 the sales of Electric Vehicles (EVs) are known in the year 2030 but the same data point is not given for the remaining technologies (ICE, Hybrid and Fuel cell). Instead, a market share of sales across all technologies is given.

From this we can calculate the number of car sales for all technologies as follows:

$$sales_{technology,2030} = \frac{market\ share_{technology,2030}}{market\ share_{ev,2030}} * sales_{ev,2030}$$

Calculating Yearly Targets

For most scenarios, the targets are given at 5-year time intervals. As PACTA is focused within a 5-year time horizon it is important to compare a portfolio’s 5-year production trend / technology mix against targets for each year. To solve this 2DII applies a linear interpolation between the 5, or in some cases, 10 yearly data points.

6. Full summary of Scenarios Provided in the PACTA for Banks Toolkit

Table 2. Shows the scenario provided in the PACTA for Banks Tool kit

Sector	Scenario Source	Scenario	Region coverage
Steel	ISF-NZ - 2020	NZAOA_1.5	Global
Cement	ISF-NZ - 2020	NZAOA_1.5	Global
Aviation	ISF-NZ - 2020	NZAOA_1.5	Global
Power	IEA - WEO -2020	SDS	Advanced Economies, Africa, Asia Pacific, Brazil, Central and South America, China, Developing Economies, European Union, Eurasia, Europe, Global, India, Japan, Middle East, Non OECD, North America, OECD, Russia, South Africa, Southeast Asia, United States
Power	IEA - WEO -2020	STEPS	Advanced Economies, Africa, Asia Pacific, Brazil, Central and South America, China, Developing Economies, European Union, Eurasia, Europe, Global, India, Japan, Middle East, Non OECD, North America, OECD, Russia, South Africa, Southeast Asia, United States
Power	IEA - WEO -2020	CPS	Advanced Economies, Africa, Asia Pacific, Brazil, Central and South America, China, Developing Economies, European Union, Eurasia, Europe, Global, India, Japan, Middle East, Non OECD, North America, OECD, Russia, South Africa, Southeast Asia, United States
Power	ISF-NZ - 2020	NZAOA_1.5	Africa, China, Eurasia/Eastern Europe, Global, India, Latin America, Middle East, Non OECD Asia, OECD Europe, OECD North America, OECD Pacific

Power	IEA - NZE2050 - 2021	NZE2021	Global
Oil and Gas	IEA - WEO -2020	SDS	Global
Oil and Gas	IEA - WEO -2020	STEPS	Global
Oil and Gas	IEA - WEO -2020	CPS	Global
Oil and Gas	ISF-NZ - 2020	NZAOA_1.5	Global
Oil and Gas	IEA – NZE2050 - 2021	NZE2021	Global
Coal	ISF-NZ - 2020	NZAOA_1.5	Global
Coal	IEA - NZE2050 - 2021	NZE2021	Global
Coal	IEA – WEO - 2020	CPS	Global
Coal	IEA – WEO - 2020	STEPS	Global
Coal	IEA – WEO - 2020	SDS	Global
Automotive	IEA - ETP - 2017	B2DS	Global
Automotive	IEA - ETP - 2017	RTS	Global
Automotive	IEA – NZE2050 - 2021	NZE2021	Global

Funding Information

This project is part of the International Climate Initiative (IKI). The Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) supports this initiative on the basis of a decision adopted by the German Bundestag.

Supported by:

Federal Ministry
for the Environment, Nature Conservation
and Nuclear Safety

based on a decision of the German Bundestag

The views expressed in this report are the sole responsibility of the authors and do not necessarily reflect the views of the funders.