



Measuring the climate alignment of corporate lending loan books using the PACTA methodology, recommendations on the implementation and use cases for Malaysian banks.

Climate Portfolio Alignment for Corporate Lending in Malaysia

A pilot study using the PACTA methodology and recommendations for Malaysian Banks

28/02/2022

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About the Authors

The 2° Investing Initiative (2DII) is a global, non-profit think tank working to align financial markets and regulations with the Paris Agreement goals.

WWF is an international conservation organisation working to conserve nature by focusing on six major goals (forests, oceans, wildlife, food, climate and energy, freshwater) and three key drivers (markets, finance and governance).



Funder

This work has received funding from UK PACT Malaysia



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Executive Summary

This report is co-authored by 2 Degrees Investing Initiative (2DII) and the World Wide Fund for Nature Malaysia (WWF-Malaysia). It documents the very real threat of climate change on the Malaysian financial system whilst contextualizing Malaysian regulatory and policy environment as a source of future climate transition risk. The Paris Agreement Capital Transition Assessment (PACTA) is presented as a tool to aid Malaysian banks in measuring the portfolio alignment to climate goals and as a tool to better understand climate transition risk. A pilot study with a group of Malaysian banks shows that 8 out of the 10 climate critical technologies assessed are not aligned with the goals of the Paris Agreement. Recommendations are made for the implementation, improvement and actionability of PACTA for banks and supervisors in the Southeast Asia region with supporting illustration on just transition.

Summary of Pilot Study Findings (detailed in section 3)

The following table summarizes the production trajectory alignment in 2025 of an aggregated sample of Malaysian banks across technologies within the fossil fuel, power and automotive sectors. The scenarios, benchmarks and implied temperature ranges cited in Table 1 are discussed further in section 2 and 3 of this document.

Table 1. Overview of the climate alignment of different sectors and technologies

	Fossil Fuel Extraction (World Energy Outlook 2020 - Global)		
	Oil	Gas	Coal
Aggregated Portfolio Global (Malaysia banks)	>2.7°C	>2.7°C	NA*
Corporate Economy Global	>2.7°C	1.8°C-2.7°C	NA*

	Power Generation (World Energy Outlook 2020 - Southeast Asia)				
	Coal Capacity	Oil Capacity	Gas Capacity	Hydro Capacity	Renewable Capacity
Aggregated Portfolio Southeast Asia (Malaysia banks)	<1.8°C	>2.7°C	<1.8°C	1.8°C-2.7°C	>2.7°C
Corporate Economy Southeast Asia	>2.7°C	>2.7°C	>2.7°C	<1.8°C	>2.7°C

	Automotive (IEA Net Zero - Global)			
	ICE Vehicles	Hybrid Vehicles	Electric Vehicles	Fuel Cell
Aggregated Portfolio Global (Malaysia banks)	>1.5°C	>1.5°C	>1.5°C	>1.5°C
Corporate Economy Global	>1.5°C	<1.5°C	>1.5°C	>1.5°C

*Coal extraction was not assessed as part of this pilot study – see section 3 for more details.

Summary of Key Recommendations (detailed in section 5)

❖ Recommendations on Implementing PACTA for Banks (detailed in section 5.a)

Malaysian banks should:

- Measure the alignment of their portfolios.
- Use regional benchmarks.
- Measure alignment to a Paris aligned scenario.
- Match loan book exposures to the real economy at the direct loan taker level.
- Repeat the exercise annually to track progress.
- Maintain temporal consistency between scenarios, loan book and real economy production data.
- Use a portfolio weighted approach for results at the portfolio level.
- Measure alignment against all PACTA sectors prioritizing based on materiality to the bank.
- Disclosure alignment results publicly.

Financial supervisor / regulator / governments should:

- Run PACTA at a national level (see box 3).

❖ Recommendations on improvements to PACTA for Banks tool (detailed in section 5.b)

- Develop and include more granular scenarios.
- Enhanced matching software in the PACTA for Banks toolkit.
- Sectoral decarbonization pathways (sector technology roadmaps) for industry sectors.
- Improve financial asset coverage. (e.g., project finance)
- Improve sectoral coverage. (e.g., real estate and agriculture)

❖ Recommendations on implementing PACTA for Banks for specific uses cases (detailed in section 5.c)

- Risk management.
- Setting targets and monitoring progress.

- As a step in taking and monitoring climate actions.
- Reporting and disclosure.

❖ **Recommendation on incorporating just transition considerations into climate action plan**
(detailed in section 5.d)

- Embed just transition criteria in financing and investing decisions
- Conduct social dialogue between all the affected parties.
- Bridge the skills gaps to minimize employment gaps.
- Require the disclosure of employment risks and just transition plan to address them.
- Enact just transition policies and mainstream it across climate policy.
- Invest in sectors which can absorb high low-skill employments.
- Establish a just transition Fund.

Introduction

Article 2.1(c) of the Paris Agreement stipulates that financial flows be made consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.

For many financial actors, this ambition has been cemented with the formation of the Glasgow Financial Alliance for Net Zero (GFANZ) in April 2021, with all GFANZ members committing to carbon emission reduction targets by 2030 and 2050. The Intergovernmental Panel on Climate Change (IPCC) suggested that in a model pathway with no or limited overshoot of 1.5°C, net zero has to be achieved by 2050¹. It follows that financial institutions need to be able to measure the alignment of their portfolios towards the goals of the Paris Agreement and indeed net zero by 2050.

In doing so, financial institutions can gain insight into their exposure to risks and opportunities presented by climate change mitigation, while also understanding how they can play a pivotal role in achieving these goals. Financial Institutions (FIs) can act as agents of change in the real economy through steering their capital and influencing the enabling environment, thereby driving climate impact in the real economy.

The Paris Agreement Capital Transition Assessment (PACTA) is a tool that helps financial institutions answer the question of portfolio alignment by using climate scenario analysis. PACTA does so by comparing sectoral decarbonization pathways against companies' production plans based on physical assets in the real economy. By doing so, financial institutions can better understand their climate transition risk and opportunities and the influence they can have on mitigating climate change in the corporate economy.

This report aims to:

- 1) Document Malaysia's climate goals and commitments, thereby contextualizing the need for banks to measure their portfolio alignment. (Section 1)
- 2) Explain the PACTA for Banks methodology. (Section 2)
- 3) Document the findings of a PACTA pilot test conducted with a sample of Malaysian banks. (Section 3)
- 4) Presents the inclusion of just transition consideration into climate action plan (Section 4)
- 5) Make recommendations on:
 - a. How to use the PACTA for Banks for potential users
 - b. Improvements that can be made to the tool

¹ Net zero CO₂ emissions: Net zero carbon dioxide (CO₂) emissions are achieved when anthropogenic CO₂ emissions are balanced globally by anthropogenic CO₂ removals over a specified period. For further detail please refer to IPCC's Special Report on Global warming of 1.5°C at https://www.ipcc.ch/site/assets/uploads/sites/2/2019/06/SR15_Full_Report_Low_Res.pdf

- c. Suggested use cases for banks to use PACTA results with a particular focus on risk management
- d. Embedding just transition strategy into climate action plan (Section 5)

Section 1 - Climate Change Risks and Opportunities in Malaysia

1.a) Malaysia's Climate Goals and Commitments

The recent Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report provides conclusive evidence that anthropogenic (human-led) activities have altered the earth's climate, therefore presenting a "code red" for humanity. The report underlines the importance of limiting the global rise in temperatures to 1.5°C, failing which we will risk eroding the Holocene, the epoch of climate stability which enabled human civilization to thrive, and enter a period of climate instability which will pose widespread social and economic impacts.

The Malaysian economy is exposed to a number of climate change vulnerabilities². Malaysia is expected to experience a rise in heatwaves and droughts in certain regions. In particular in Kelantan and Sabah. Specifically, drought risk is expected to rise by 4-8%, which will significantly impact the key agricultural commodities; rice, rubber, palm oil and cocoa, and leave certain areas of the country unsuitable for cultivation. In other regions, there will be an increase in the frequency and severity of floods. In the worst GHG emissions scenario, as early as 2030 the population at risk from flooding in Malaysia is expected to rise by 70,000 people compared to 2010, with predicted annual damages doubling to USD 3.6 billion. This will be exacerbated by a rise in cyclones and storms. Additionally, the chronic risk of a rise in sea levels places 7000km² of coastal land at risk, representing six percent of palm oil and four percent of rubber production areas, as well as significant tracts of paddy planting areas, industrial zones and population centers.

Between 60-70%³ of Malaysia's exports are to countries which have announced 2050 Net Zero commitments. In line with these commitments, a number of these jurisdictions are considering carbon border adjustment mechanisms, which will subject Malaysian exports to carbon pricing. Furthermore, between 20-30%⁴ of Malaysia's GDP is focused on high-risk ESG sectors such as Oil and Gas. Complemented by demand-led changes towards climate-friendly products and services, particularly through the growing adoption of climate criteria in the global financing landscape, these developments place the Malaysian economy at high exposure to climate-related transition risks. As an illustration, it is estimated that between 21% of the GDP and 26%⁵ of the BURSA stock market capitalization is concentrated in companies which face high transition risks. As of 2019, 11.7%⁶ of

² <https://reliefweb.int/sites/reliefweb.int/files/resources/climate-risk-country-profile-malaysia.pdf>

³ https://wwfmy.awsassets.panda.org/downloads/securing_our_future_net_zero_pathways_for_malaysia_12_november_2021.pdf

⁴ https://wwfmy.awsassets.panda.org/downloads/securing_our_future_net_zero_pathways_for_malaysia_12_november_2021.pdf

⁵ https://wwfmy.awsassets.panda.org/downloads/securing_our_future_net_zero_pathways_for_malaysia_12_november_2021.pdf

⁶ <https://www.bnm.gov.my/climatechange>

assets held by financial players in Malaysia are exposed to climate change risks, however as Malaysia is expected to lose up to 36.3%⁷ of its GDP by 2050 under our current climate trajectory, this number is expected to rise significantly.

1.b) Societal and regulatory expectations for corporates is tightening

Societal expectations for climate action are intensifying, and national and corporate actors are being placed under increasing pressure to take the appropriate steps to limit the global average rise in temperature to 1.5°C. In 2015, Malaysia became a signatory of the Paris Agreement, and in 2021 updated its Nationally Determined Contribution (NDC), targeting to reduce its economy-wide carbon intensity (against GDP) of 45% in 2030 compared to 2005 level, which paves the way for Malaysia's recently announced intention to be carbon neutral at the earliest by 2050. These climate commitments are being gradually enshrined in Malaysia's policy and legal framework, including the National Policy on Climate Change⁸ and the upcoming National Energy Policy⁹, and plans to table legislation on climate change in parliament in the near future¹⁰.

In line with these developments, the financial regulators in Malaysia have introduced a number of initiatives to strengthen climate action in the financial sector. In 2019, the Joint-Committee on Climate Change (JC3) was established by Bank Negara Malaysia, the Securities Commission Malaysia, BUSRA Malaysia and 19 financial industry players to facilitate a smooth transition to a low-carbon financial landscape. The JC3 is currently developing a reference guide on implementing the recommendations of the Task-Force Climate Related Financial Disclosures (TCFD), and on climate risk management and scenario analysis for financial institutions. Complementing this, in 2021 Bank Negara Malaysia published the Climate Change and Principles-Based Taxonomy (CCPT) which aimed to standardize the classification of climate-related exposures.

Supported by these regulatory initiatives, the Malaysian financial industry is undergoing a period of transformative change. In the past year alone, two major Malaysian banks have announced their pledges to be net-zero by 2050, and numerous other banks have committed to targets for sustainable financing, while exclusions for high-emitting sectors such as coal are on the rise. This follows the trend of increasing momentum of decarbonization initiatives within the wider Malaysian corporate sector. A number of major local corporations have made climate commitments, including Petronas¹¹ and Tenaga Nasional¹² which have both set net-zero by 2050 targets. Additionally, the

⁷<https://www.swissre.com/institute/research/topics-and-risk-dialogues/climate-and-natural-catastrophe-risk/expertise-publication-economics-of-climate-change.html>

⁸ <https://www.pmo.gov.my/2019/07/national-policy-on-climate-change/>

⁹ <https://www.malaymail.com/news/malaysia/2021/11/22/tok-pa-putrajaya-in-final-phase-of-developing-national-energy-policy/2022750>

¹⁰ <https://www.astroawani.com/berita-malaysia/kerangka-undang-undang-perubahan-iklim-dijangka-siap-awal-2022-331255>

¹¹ <https://www.petronas.com/sustainability/net-zero-carbon-emissions>

¹² <https://www.tnb.com.my/announcements/tnb-sets-net-zero-emissions-aspiration-by-2050>

CEO Action Network¹³, led by a steering committee with representation from key public and private entities, was recently established to further advocate for sustainability within the corporate sphere.

Despite these achievements, an assessment¹⁴ of climate risk disclosures amongst public listed companies (PLCs) in Malaysia found that climate risk management and reporting still require significant improvements. Key areas of concern for PLCs as a whole include the low adoption of climate scenario analysis, while the financial services sector was found to be lacking in disclosures of information on the processes related to climate-risk management, including the identification and assessment of climate-related risks. Furthermore, among the economic sectors assessed, the financial services sector scored comparatively low compared to others such as the plantation and telecommunications sectors.

1.c) Climate change poses opportunities for FIs

While the transition to a net-zero economy by 2050 will raise certain challenges, Malaysia is uniquely positioned to make this transition through a socio-economically positive and feasible pathway. The recent WWF-BCG report “Securing Our Future: Net Zero Pathways for Malaysia”¹⁵ identified a number of priority actions to support Malaysia’s decarbonization. Among others, these actions include conserving and strengthening natural assets for climate mitigation, in particular Malaysia’s forest-based carbon sinks, which in 2016 offset up to 77% of the country’s emissions. Additionally, the decarbonization of the energy sector should be achieved through the phase-out of coal and adoption of renewable alternatives, while low-carbon transportation can be promoted through enhanced electric vehicle (EV) adoption. Furthermore, a carbon tax should be introduced, targeting \$USD50-80/tonne of CO₂e by 2030 to ensure the highest material impact.

It is estimated that GDP increments of up to RM50-60 billion per annum can be expected through the above actions. However, significant collaboration across the public and private sectors and civil society will be required in order to achieve these actions. Playing a key role in the transition will be the financial system, as RM350-400 billion in climate investment will be needed to operationalize the aforementioned actions. Private capital can be mobilized through investments in the energy, transport and carbon capture and storage (CCS) sectors, as well as other green bankable products.

As the climate changes, so does the physical, regulatory, societal and corporate environment that underlies the financial system. While climate change poses risks to the economy, financial institutions can manage these risks effectively and leverage on new financial opportunities from the

¹³ <https://www.ceoactionnetwork.com/about-us>

¹⁴ https://assets.ey.com/content/dam/ey-sites/ey-com/en_my/topics/climate-change/ey-climate-risk-disclosure-barometer.pdf

¹⁵ https://wwfmy.awsassets.panda.org/downloads/securing_our_future_net_zero_pathways_for_malaysia_12_november_2021.pdf



transition in a way that supports the wider decarbonization of Malaysia as a whole, thus protecting people and the planet.

Section 2 – Measuring Climate Portfolio Alignment through Climate Scenario Analysis using the PACTA methodology

The following section is an introduction to the PACTA for Banks methodology. Further documentation, including detailed methodology and practical user guides, are linked below and can be found at www.transitionmonitor.com.

- PACTA for Banks is a free, open-source and iterative methodology. The full methodology document can be found [here](#).
- PACTA can be implemented using any software, but free and open-source software packages are provided in R [here](#).
- It can be implemented using any data input, but a free data set is provided through [Asset Resolution](#) and can be accessed [here](#)¹⁶
- Practical user guides and training materials on applying can be found [here](#).

2.a) Introduction to PACTA

The Paris Agreement Capital Transition Assessment (PACTA) is a free and open-source methodology and software tool developed by the 2° Investing Initiative (2DII) to assess the alignment of investor and bank portfolios with climate goals. PACTA enables financial institutions to measure the alignment of their portfolios with climate scenarios across a set of climate-critical sectors and technologies.

At its core, PACTA compares what needs to happen in sectoral decarbonization pathways, here within referred to as “climate scenarios”, with financial actors’ exposures to companies in the most carbon intensive sectors. PACTA provides a five-year forward-looking portfolio alignment projection based on bottom-up analysis.

The analysis looks at the investment and production plans of companies, which in turn are based on the physical assets that the companies own. This information is allocated to the portfolio level per sector and compared to sectoral decarbonization pathways projected in different climate scenarios.

PACTA then provides the (mis-)alignment between a portfolio and climate scenarios. This information can be used by banks to: inform transition risk, identify steering opportunities, disclose and report, set targets and inform decision making. These use cases are built out further in section 4.

¹⁶ As of time of writing (jan-2022)

2.b) PACTA's Sectoral Scope

The PACTA for Banks methodology covers seven of the most carbon-intensive sectors in the economy (i.e., the sectors most exposed to transition risks) – oil and gas, coal, power, automotive, cement, aviation, and steel (the "PACTA sectors").¹⁷ Together, they are responsible for around 70% of all CO₂ emissions.¹⁸

In each sector, PACTA focuses on the part of the value chain with the highest contribution in terms of CO₂ emissions. For example, the oil and gas sector, focuses on upstream activities related to production, the power sector the focuses on power generation; the automotive sector focuses on the manufacture of automobiles, while steel and cement focuses on the manufacture of the raw steel and cement products and aviation focuses on the airliners.

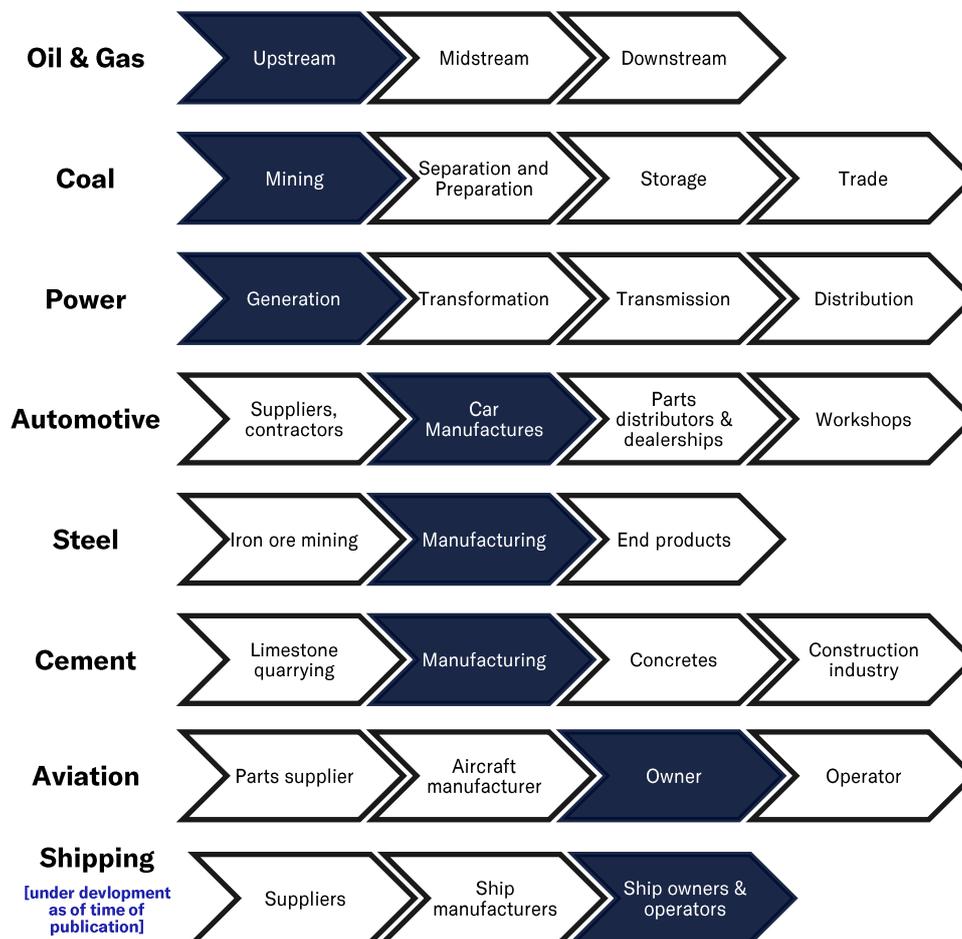
These elements of the value chain are chosen as they are:

- 1) The most climate critical – where most emissions come from.
- 2) Where steering efforts are required in order to bring the rest of the value chains in line.
- 3) Directly tied to production figures presented in climate change scenarios. For example, megawatt (MW) of power, barrels of oil, number of cars, tons of cement.
- 4) They are actionable by the lender. For instance, a lender is more likely to be able to influence the number and technology of cars being produced, than the driving habits of an individual driving a car.

¹⁷ It is worth noting two noticeable exceptions here. Namely that of Real Estate and Agriculture as noticeable climate critical sectors. The reason for the exclusion to date is that they do not traditionally fit into the scenario analysis methodology of PACTA. That does not mean to say that they are not important sectors and indeed financial institutions should be encouraged to include these sectors in their climate efforts.

¹⁸ This is the high-level estimate done by 2DII based on the World Resources Institute's greenhouse gas emissions data.

Figure 1. PACTA sectoral scope:



2.c) PACTA for Banks Financial Scope and Data Inputs

The PACTA for Banks toolkit requires three main types of information input to perform the analysis:

- i. **Corporate lending portfolio data:** including counterparty names, amount borrowed and credit limit.¹⁹ Sectoral classification given by industry sector classification codes (e.g. NACE). (Note that 2DII does not see or receive any of this data; rather, it is processed by the bank’s internally)

Please refer to “Practical User guide 2” for further information: [here](#)

¹⁹ Either financial variable can be used in the analysis a weighting factor – this is discussed further in this document.

- ii. **The bottom-up production forecasts:** A free dataset is made available by Asset Resolution and is based on the physical assets the companies own. This data is referred to as the Asset-Based Company Data (ABCD). However, the PACTA methodology is data input agnostic. This means that any data provider can be used to run the analysis, provided that the data contains forward-looking production estimates.
Free data is available for banks to utilize provided by Asset Resolution²⁰ [here](#).
- iii. **Climate scenario data:** Sectoral decarbonization pathways provided by third party institutions such as the International Energy Agency (IEA). See below for more details on the scenarios used in this analysis.
Please refer to “Scenario Supporting Document” for more information [here](#).
Preformatted scenarios are available [here](#) for users to use and documented below.

2.d) Sectoral decarbonization pathways – “Climate scenarios”

The PACTA for Banks methodology relies on the measurement of the alignment of climate-relevant sectors in a portfolio with decarbonization scenarios referred to here as “climate scenarios”²¹. Scenarios provide important insights into possible future decarbonization pathways that have the potential to achieve the scale of climate change mitigation required to limit global temperature rise. PACTA is scenario agnostic, which allows the use of any scenario with sufficient data granularity. For the PACTA analysis, multiple (sets of) scenarios are often included for the following reasons:

- Scenarios do not always cover the same sectors. Some may cover fossil fuels, power and automotive, while others may cover steel and cement. Sometimes they are all covered in one scenario, but this is not always the case.
- Different scenarios have different carbon budgets, as well as different probabilities of achieving the carbon budget. Some scenarios have a 1.5°C goal with 50% probability, while others may have a 2°C goal with 66% probability.

It is important to bear in mind that scenarios provide pathways to reach those goals, but they do not claim to predict the future. Thus, two scenarios with the same level of climate ambition (e.g. 1.5°C) might achieve that goal via different pathways. Scenarios rely on a series of modelling

²⁰ If users use an alternative data providers and want to make use of the free PACTA for Banks software packages then they must format the data in the template provided in "r2dii.data::demo_ald". [here](#)

²¹ Note that in PACTA the scenarios used are not strictly climate change scenarios which would be the IPCC scenarios with SSPs and RCPs – Rather the scenarios used are sectoral decarbonisation pathways which can be thought of as technology road maps – these scenarios incorporate the former climate change scenarios in their respective modelling of potential future pathways.

assumptions and expert judgements²² about possible futures that are important to understand. For more information about scenarios, please see the PACTA for Banks Scenarios Document ([here](#))²³. Note that the full set of ready to use scenario files can be found [here](#).

Figure 2. Preformatted scenarios available for Banks to use. All files can be found [here](#).

Scenario	Scenario Used	Implied Temperature Rise in 2100	Probability	Publication	Abbreviation
Sustainable Development Scenario	Oil and Gas, Coal, Power	1.8°C	66%	IEA, WEO 2020	SDS
Stated Policy Scenario	Oil and Gas, Coal, Power	2.7°C	50%	IEA, WEO 2020	SPS
Current Policy Scenario	Oil and Gas, Coal, Power	3.2°C	50%	IEA, WEO 2019	CPS
Net Zero 2050	Oil and Gas, Coal, Power, Automotive	1.5°C	50%	IEA, Net Zero by 2050, a roadmap for the global energy sector	NZE_2050

²² Modelling assumptions and expert judgement are made around factors such as demographic change, GDP growth, behavioural shifts, and a breadth of social, political and economic factors.

²³ https://www.transitionmonitor.com/wp-content/uploads/2021/07/20210706-PACTA-for-Banks_Scenario-Supporting-document_V11.pdf

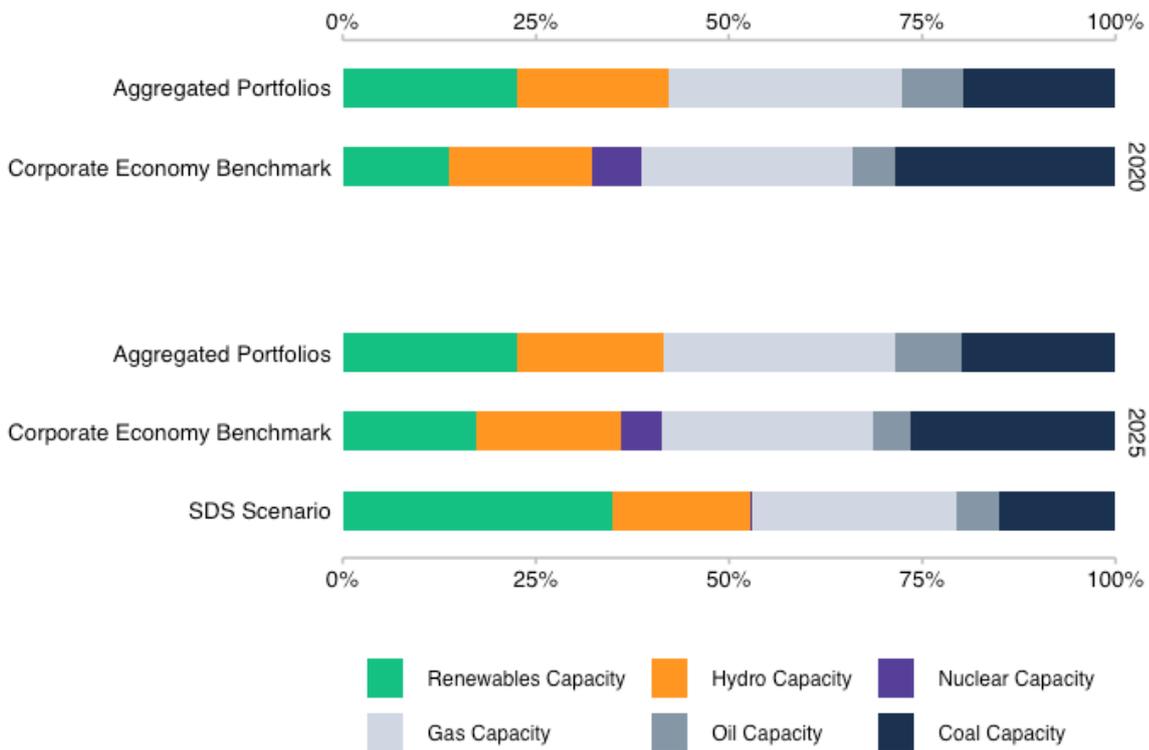
Below 2 Degrees Scenario	Automotive	1.7°C	50%	IEA, ETP 2017	B2DS
2 Degrees Scenario	Automotive	2°C	50%	IEA, ETP 2107	2DS
Reference Technology Scenario	Automotive	2.7°C	50%	IEA, ETP 2017	RTS
NZ ISF	Steel, Cement, Power, Aviation, Oil and Gas, Coal	1.5°C	66%	ISF Sectoral pathways to Net Zero Emissions	NZ ISF

2.e) PACTA Metrics

The PACTA approach has three main metrics: Technology Mix, Production Volume Trajectory and Emission Intensities. The technology mix and the production volume trajectory are used for Fossil Fuels, Power, and Automotive – where technology roadmaps are known. For example, in the power sector there exists technologies to which the transition can be made, e.g. coal fired power generation can shift to renewable energies. Meanwhile, emission intensities are used for Steel, Cement and Aviation – where technology roadmaps are less well defined. Each metric provides different pieces of the alignment puzzle, and together they provide a more holistic view of the alignment of portfolio exposures in these sectors. Below is an explanation of each metric.

2.e.i) Technology Share Metric

Figure 3: Power Generation Technology Share. *This plot is made with mock data and for illustrative purposes*



The technology share represents the weight of each technology in the sector as a percentage of investment therein. The portfolio's technology share is compared to the climate scenario and a market benchmark - defined as the corporate economy (section 2.f) (see Figure 3 as an example).

The technology share metric focuses on technology shifts within the power and automotive sectors, namely: (i) the changes in the technological processes by which outputs are produced (e.g. shift from coal-fired to renewable power capacity - whereby power is still generated but the process of doing so has shifted), and (ii) changes in the nature of the output itself (e.g. shift from internal combustion engines (ICE) to electric vehicles (EV) - whereby the physical output is different between ICE cars and EV cars). This metric measures the bank's relative exposure to the economic activities that are impacted by the transition to a low-carbon economy. It is a function of how diversified the banks' portfolios are across the companies they finance and how diversified these companies' activities are across technologies or output types.

Figure 3 shows a stylized high carbon (i.e. oil, gas, coal) and low carbon (i.e. renewables, hydro, nuclear) technology share for the power sector in a bank's lending portfolios:

- Aggregated Portfolio 2020: reflects the current technology mix of the power sector in banks' portfolios.
- Corporate economy 2020: reflects the current technology mix of the power sector in the global market.²⁴
- Aggregated Portfolio 2025: shows the projected technology mix in 2025 based on the companies' production plans for the next five years in banks' portfolios.
- Corporate economy 2025: reflects the projected technology mix in 2025 based on the companies' production plans for the next five years at a global level.
- SDS Scenario 2025: reflects what the portfolio would have to look like to be considered aligned with the Sustainable Development Scenario (SDS) scenario (see figure 2 for more details on scenarios)

Note that PACTA assumes a static balance sheet – meaning that the loan exposures as of the start year (in this example 2020) are kept constant for 5 years. As such, the difference in the technology mix between Portfolio 2020 and Portfolio 2025 is solely a result of the production plans of the companies the banks are currently financing, and not a result of any change in the loan book's composition. Note that the forward-looking production plans is capped at 5 years as this is the time frame to which reliable data can be gathered.

2.e.ii) Production Volume Trajectory Metric

The production volume trajectory metric aims to measure the alignment of a portfolio's projected production volumes, based on the five-year capital plans of companies, to those given in climate scenarios. It is used for the fossil fuels, power, and automotive sectors.

²⁴ Global Market in this case is defined as the total production of companies in the Asset Based Company Data used for this exercise.

Figure 4: Internal Combustion Engine (ICE) Production Volume Trajectory. *This plot is made with mock data and for illustrative purposes*

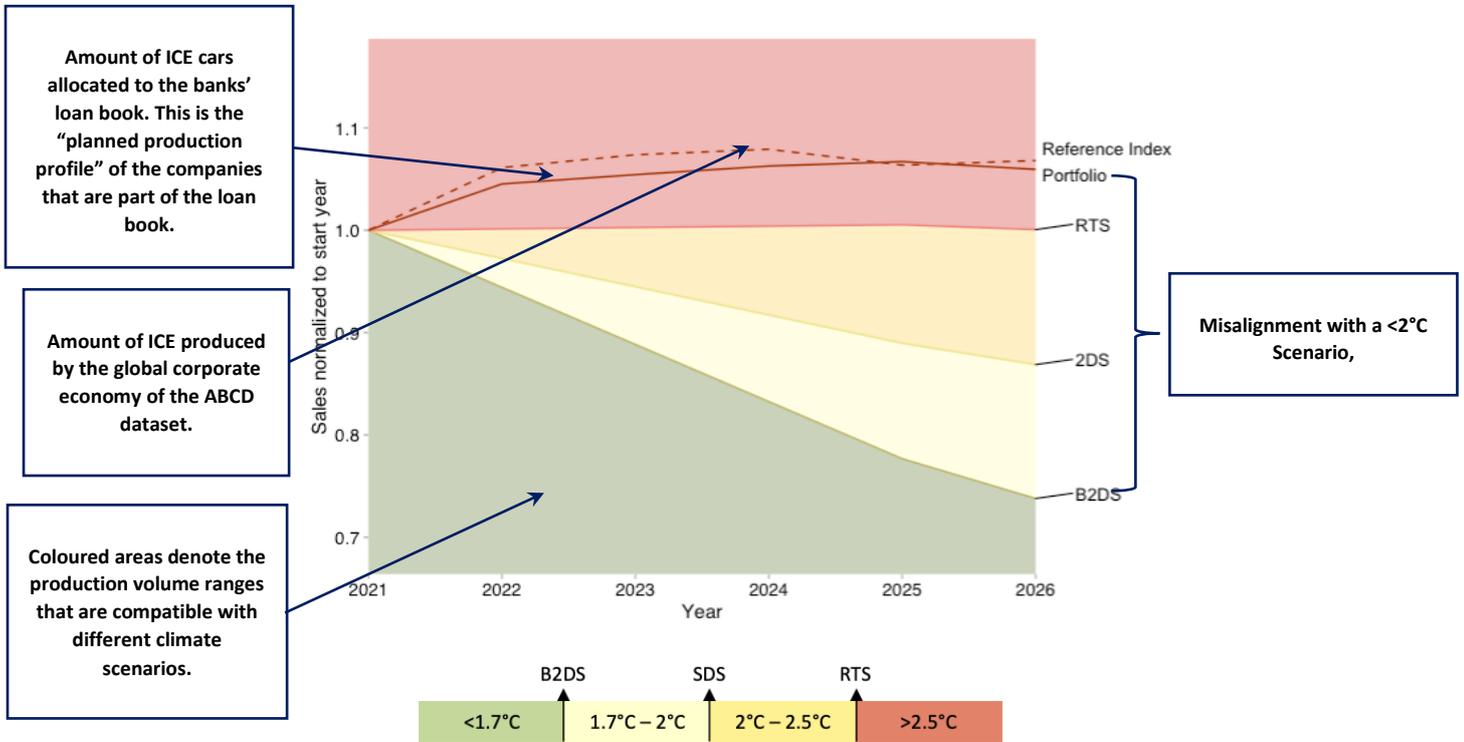


Figure 4 shows the production volume trajectory metric for ICE automotive capacity as an example. This metric measures the alignment of a portfolio's projected production volume over the next five years with the production volume ranges set as targets in different climate scenarios. Changes in production volume result from the sheer expansion or contraction in production coming from the technology/fuel (e.g., a company increasing ICE production). The Y-axis shows the normalized production planned for the next five years with the current capacity represented as 1.

In Figure 4, banks' ICE production trajectory falls within the red area and increases between 2020 and 2025. This means that the banks' portfolio companies' production plans for ICE in the next five years is, worse than the Reference Technology Scenario (RTS) scenarios, but better than the global corporate economy. For information on how PACTA allocates production volumes and attributes climate scenarios to a financing portfolio, please see the PACTA for Banks Methodology Document²⁵.

²⁵ https://www.transitionmonitor.com/wp-content/uploads/2021/07/PACTA-for-Banks-Methodology-document-02-07-2021_v1.2.0_v4.pdf

Box 1. Interpreting the technology mix and production volume trajectory together

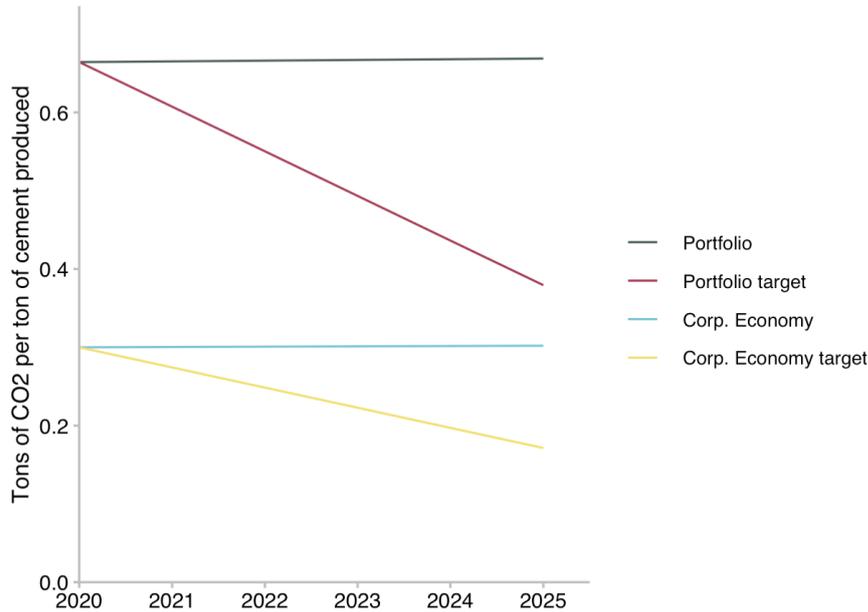
The technology share metric and the production volume trajectory metric both provide an indication of how aligned the companies that are part of the loan book are with a given scenario. However, they differ in that the technology share metric is a measure of the relative amounts invested in different climate relevant technologies within a loan book's portfolio, while the production volume trajectory measures whether the required change in the production per technology is aligned with a given scenario. It follows that it is possible to be aligned in one but not the other. For example, if a portfolio has a high low carbon share of its technology mix but is not increasing any production in low carbon technologies at the required rate. Then the portfolio may be aligned from a technology share perspective but not from a production volume trajectory one.

2.e.iii) Emission Intensity Metric

The emission intensity metric measures the average CO₂ intensity of the portfolio in the steel, cement and aviation sectors. This emission intensity is given as CO₂/economic unit of output (for example, CO₂/per ton of steel/cement produced and CO₂/rpk for aviation). This is then compared to an emission intensity reference point set by a climate scenario.

While this is not the main metric of choice for the largest sectors tackled in this methodology, the emission-intensity of the activities financed by the portfolio is nonetheless the first metric in sectors for which no clear technology pathways have been set out (namely, steel, cement, and aviation). Put differently, for these sectors no zero- carbon alternative yet exists. As such, it is not possible to use the technology mix metric or the volume production volume trajectory metric to measure alignment. However, it is still imperative to steer capital in a way that aims to decrease carbon emissions in these sectors – hence the emission intensity metric is used. In other words, the emission intensity metrics is used when no well-defined technology road maps are available as this as a metric is technology agnostic.

Figure 5: Cement Emission Intensity Metric. *This plot is made with mock data and for illustrative purposes*



In Figure 5 the grey line shows the portfolios emission intensity remains constant for the next 5 years. The purple “portfolio target” line is the alignment target for the specific portfolio. The corporate economy line in blue shows the emission intensity of the corporate economy today and five years in the future and the yellow line is the target for the corporate economy. Note that the respective target lines are not perpendicular, this is as they will converge at the end point of the scenario- to the right of the x axis. As the portfolio has a higher emission intensity than the corporate economy, it is required to decrease its emission intensity at a faster rate that the corporate economy. This portfolio is misaligned with its own target in the following 5 years.

Box 2. Production Values vs Emission Intensities (EI) as Climate Indicators

As explained, PACTA compares the sector decarbonization pathways to company's forward-looking plans. The question then becomes: what information does the sector pathway give us, and how does PACTA measure alignment within the sector? For a sector to decarbonize, very often a technology shift is needed. Sectors need to switch from high carbon technologies, such as coal power, to low carbon technologies, such as renewable power. For some sectors, such as Power and Automotive, this technology shift is well known and well documented. Here PACTA measures alignment with the production volume trajectory and technology share metrics described above. For some sectors, such as Steel, Cement, and Aviation, where it is not yet clear which zero- or low-carbon technology must be scaled up, all we know is that overall emissions in the sector must go down. Here we use an emission intensity metric. There are several reasons for this approach:

- 1) **Direct link to tangible economic units of output in scenarios and the real economy.** In other words, the unit from the ABCD is the same as the ones given in the scenarios. The number of ICE cars needs to decrease and the number of EVs needs to increase. If emission intensities were used, you would have to account for efficiency gains within each individual car model. This is technically feasible however it adds additional modeling which comes with added uncertainty. Furthermore, it may send the wrong signal to clients, as they may look to improve the efficiency (decreasing the EI) of an ICE rather than switching to EV as prescribed by the climate scenario to which alignment is being measured.

In the case when well-known technology roadmaps are not given (steel, cement and aviation) then efficiency gains are a valid method to drive emission reductions. Likewise, this is the unit that we can compare from the ABCD (production values per technology) to EI from the scenarios – with an emission factor model conversion in between. Note that if and when technology roadmaps become available for steel, cement and aviation they can be included in the production volume trajectory and technology share metrics but until then we revert to the emission intensity metric.

- 2) **Availability and Comparability of data.** The PACTA for Banks data set uses forward looking production values aggregated up from 3rd party business intelligence data providers at the asset level. Using this as a climate indicator allows for vastly improved data coverage when compared to alternative climate indicators*. Furthermore, this data points are comparable. This remains the case when converted to EI as the same emission factor model is applied.**
- 3) **Actionability of the lender.** Production units are more likely to be actionable by the lender than emission intensities. In other words, a lender may be able to steer their capital to influence a corporate to build out or decommission production units in a given technology. This is not to say that emission intensities cannot be a useful tool to set reduction targets for clients which can be encouraged by the lender through better terms – this is a useful use case of emission intensities. However as with point (1) this might not lead to the required shift in technologies presented in the scenarios. Taking the power sector as an example: PACTA uses power install capacity as the climate indicator (MW) the emission intensity equivalent would be CO₂/MW/h. A bank may be able to directly influence a change MW being built out in renewables instead of coal fired power generation but would find it less easy to influence the change in CO₂/MW/h of a coal fired power plant. This is mainly due to the latter being driven by demand side factors.

- 4) **Controlling for the absolute.** By adopting a purely emission intensity-based approach it is possible to achieve the emission intensity target but exceed the absolute emission reduction target.
- 5) **Forward looking.** Production forecasts allow for a forward-looking assessment of alignment. This is crucial to inform business decisions and action the required transition in the future. It follows that when emission intensities are used that they are based on forward looking data points. For example, using an emission factor model to convert from forward looking production values per technology to an Emission Intensity.

*such as self-reported carbon accounting.

**see [Transition Monitor](#) for emission factor model methodologies applied in PACTA.

All these points are not to say that there is no merit in using EI but rather to highlight the usefulness of different climate indicators (production values). Both climate indicators should be used in conjunction to address separate use cases and hence give a more holistic picture of climate alignment. EI's can be very effective tools for communication, aggregation across technologies, disclosure, identification of climate hotspots amongst other things.

It is also important to note that production values at the technology level can be converted to emission intensities through the use of emission factor models. In doing so it is important that the models used and underlying data are disclosed. It is important that such an approach is used in conjunction with the production volume trajectory and technology mix metrics so as not to obscure some of the points raised above (2 and 4).

2.f) Market Benchmarks

A comparison to the market is also made in this analysis. The market is defined as the corporate economy. In which all the assets in the ABCD for a defined region are summed by technology. This is taken to be a proxy for the investable corporate universe. It follows that a comparison can be made between the corporate economy and its progress towards climate goals, derived from climate scenarios, and the portfolio and its respective progress towards climate goals.

2.g) Allocation Principles

2.g.i) Attributing required decarbonization efforts from the scenario to the corporates.

For sectors with well-known decarbonization pathways, PACTA adopts a market share approach to alignment for sectors where decarbonization pathways are known, namely power, oil and gas, coal and automotive. This approach prescribes all actors to make the same decarbonizing efforts proportionate to their size in the markets.

For sectors where decarbonization pathways are less well known (steel, cement and aviation). PACTA relies on the sectoral decarbonization approach (SDA) which adopts a convergences approach to alignment. Here each micro economic actors' efforts have to converge with the scenario targets at the end point of the scenario.

See annex for a further description on how the market share approach is used for high carbon vs low carbon technologies and the blog post [here](#).

2.g.ii) Allocating alignment of clients to the loan book.

PACTA for banks adopts a portfolio weighted approach whereby the corporate's alignment for a given climate indicator, be it the required change in production (production volume trajectory metric), the required shift in technology mix (technology share metric) or emission intensity (emission intensity metric), is allocated to the loan book based on the relative exposure of the loan book to that corporate.

In other words, if a loan book allocates 80% of its capital to a corporate, 80% of that corporate's required alignment per climate indicator is allocated to the loan book's alignment target. This is interpreted as a risk-based approach as it captures the capital exposure to corporates that are more or less aligned with climate scenarios. Furthermore, it is perceived as actionable as it captures the capital allocation decision behind the portfolio manager.

Section 3. Portfolio Alignment using PACTA: a case study with selected Malaysian banks

3.a) Scope

Throughout 2021, a sample of Malaysian banks have been pilot testing the PACTA for Banks methodology. This section sets out the scope of the exercise.

Sectoral scope: Oil and Gas Extraction, Power Generation and Automotive. (These sectors were prioritized as they are the most climate critical and represented material exposures in the sample banks' loan books.)

Lending Portfolio Data: The corporate loan data of the sample banks was taken from the Q4 2020 data. The financial variable used to allocate company production to the respective loan books, known as the portfolio weighted approach (see section 2.g.ii), was 'debt outstanding'.²⁶ In other words, the total amount of credit drawn by each client as of Q4 2020 was used as the weighting factor.

The production forecasts of companies: The production forecasts were provided by Asset Resolution (AR) through their Asset-Based Company Dataset. This data is updated annually and contains 40,000 companies. The data is 5 years forward looking and based on 3rd party business intelligence data sets.

Climate scenario data: The International Energy Agency's (IEA) World Energy Outlook (WEO) scenarios from 2020 were used, namely the Stated Policy scenario (SPS) and the Sustainable Development Scenario (SDS) and the IEAs Net Zero scenario for Automotive. These scenarios were chosen as they are widely recognized by policy makers and financial institutions. The SDS is considered as a Paris aligned scenario and the SPS encapsulated countries' Nationally Determined Contributions (NDC). This scenario choice allows for a comparison to a < 2°C pathway (SDS) and against countries' announced climate commitments (SPS). For Automotive the IEA's Net Zero scenario is representative of a 1.5°C world. Furthermore, the WEO allows for regional contextualization of the bank's alignment. Two regional benchmarks are used: Global and/or Southeast Asia²⁷. i.e., the Southeast Asia scenario alignment target is inferred from the scenario's

²⁶ There is optionality in the PACTA for Banks methodology and supporting software to use other financial variables. For example, the credit limit or the exposure at default. The debt outstanding was chosen here as it is interpreted as risk-based weighting. i.e. the drawn amount (debt outstanding) is the potential amount that is at risk of being impacted by climate transition risk whilst also representing the banks contribution to activities of the client.

²⁷ ISO codes included in South-East Asia – Bn, Kh, Id, Ia, My, MM, Ph, Sg, Th, Vn – as defined in the WEO 2020

requirement for all countries in Southeast Asia. This may be more or less ambitious (depending on the technology) than the global target.²⁸

Market Benchmark: In this analysis, a comparison is made to the global corporate economy and the Southeast Asian corporate economy, i.e. all the physical assets in the world and all the assets in Southeast Asia within the ABCD. This is effectively the investable universe as defined by the data universe of the ABCD.

Aggregation of banks portfolios: The results have been aggregated and anonymized to preserve the anonymity of the individual participating banks. It follows that the “portfolio” being shown is an average of the selected banks. Hence the plot should be interpreted as the average (mis-)alignment of a Malaysian bank based on the sample set of banks.

This average is calculated by taking the sum of the respective bank’s delta (divergence) between their actual projection and their respective scenario alignment targets and equally weighting among them.

Match success rate: The percentage of in-PACTA-scope loans, matched to production values in the real economy (i.e., the ABCD). This figure is calculated by loan exposure, given by sector and is taken as the non-weighted average of the sample banks.²⁹ The automotive sector has a lowest match success rate. One potential explanation for this is due to the methodology used to roll up the production values in the ABCD. In the Q4 2020 ABCD used in this exercise, the data is rolled up based on a “financial control” roll up. Where by 100% of production values from a company are allocated to the parent with the controlling equity stake. This match success rate may be improved by moving to a “equity ownership” roll up. Whereby the production values are rolled up from company to parent on a pro rata basis, based equity ownership.³⁰

Table 2. Average match success rate of Malaysian banks by sector

	Oil and Gas	Power	Automotive
Match Success Rate by Loan Size (%)	80.8	78.7	32.0

²⁸ Scenario alignment targets are set for assets within the defined region.

²⁹ Based on similar PACTA exercises a 80% match success rate on average per sector is expected.

³⁰ (note that at time of analysis the “financial control” method of roll up was the only option available)

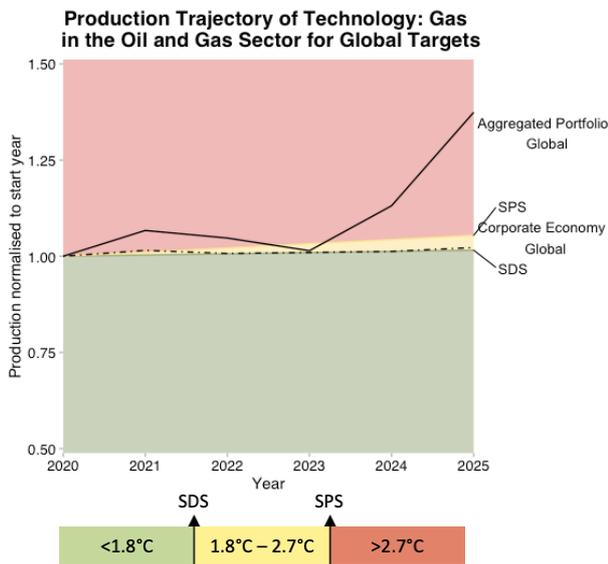
3.b) PACTA Results

The following section documents the results of the pilot study with a sample set of Malaysian banks.

3.b.i) Oil and Gas

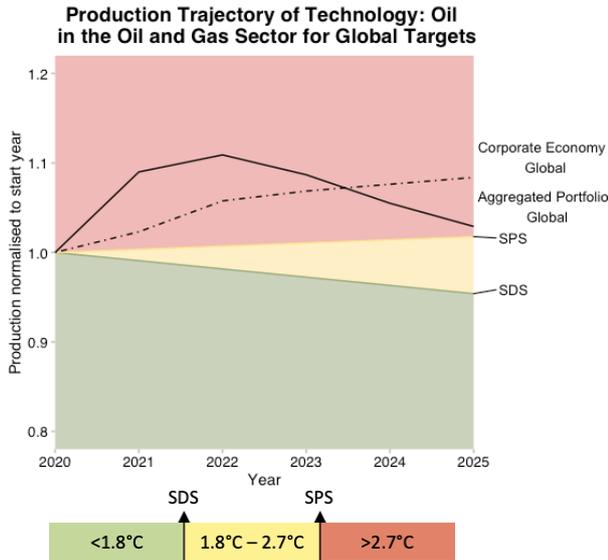
For this sector, a comparison is made with global scenario targets and global market (corporate economy). The WEO 2020 only provides targets at the global level for this sector. Note that the technology share metric is not given for oil and gas as there are no low carbon technology to transition into. Meaning that both technologies need to decrease.

Figure 6. Volume Production Trajectory. Gas Extraction



In terms of required production trends, the global SPS and SDS scenario require gas extraction to remain relatively constant for the next 5 years. This is consistent with the global corporate economy. However, the Aggregated Portfolio shows a steep increase in the rate of production from 2023 onwards leading to a significant misalignment with the SPS and SDS scenarios. The observed deviation from the required decarbonization pathway and the corporate economy could imply material exposure to transition risk for the sampled Malaysian banks.

Figure 7. Volume Production Trajectory. Oil Extraction



The SPS scenario prescribes oil extraction to remain relatively constant at the global level for the next 5 years whereas the SDS requires a slight decrease. The aggregated portfolio shows a planned increase in extraction from 2020 to 2022 before a gradual decrease through 2022 to 2025. On the other hand, the global oil corporate economy shows a steady increase in the rate of production throughout the 5 years.

The aggregated portfolio is misaligned with both the SPS and the SDS throughout the 5-year period, suggesting the sampled Malaysian

banks clients may be exposed to transition risks in the oil sector. That being said, the Malaysian bank’s alignment is better than the global corporate economy at the end point of the analysis (2025) and is moving in the right direction. i.e., it begins to decrease from 2022.

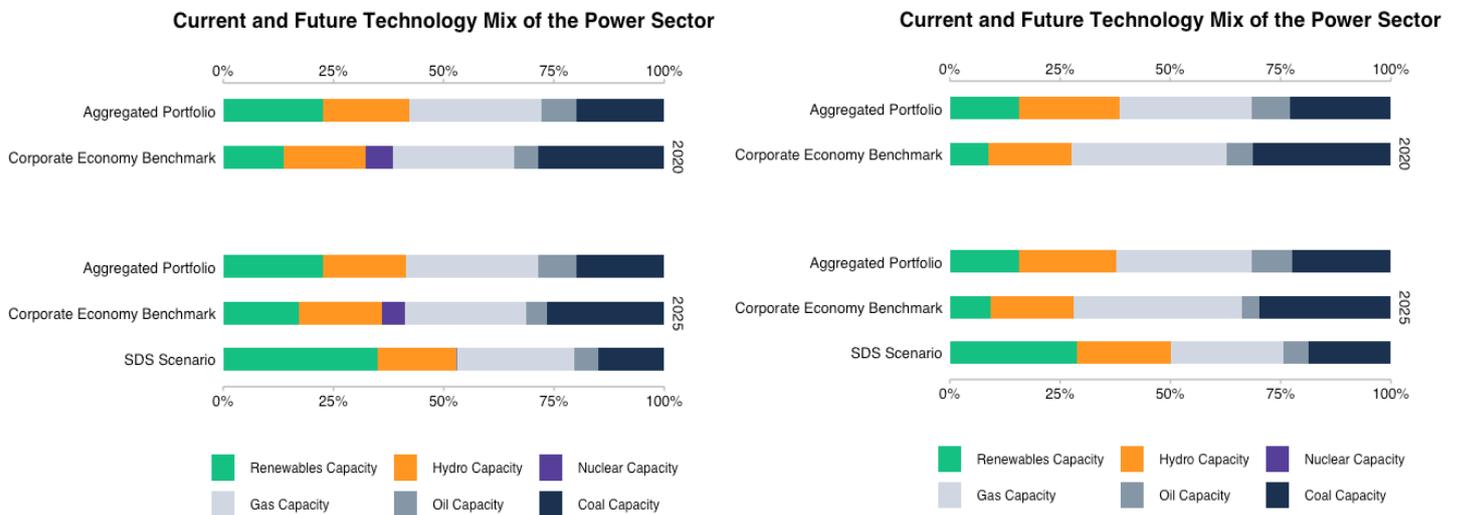
3.b.ii) Coal

Coal extraction was not covered in this pilot study as all participating banks had commitments to not finance additional coal mining. It is important to note that this does not mean that coal mining activities are not financed by the pilot banks or that coal exclusion policies will lead to a decrease in coal being extracted in the real economy.

3.b.iii) Power Generation

For this sector, a comparison is made with a global and Southeast Asia scenario and market (corporate economy) benchmark. Unlike oil and gas, power is considered as a regional market as power is produced and consumed in the same region. Hence it is deemed necessary to contextualize Malaysian alignment against a regional perspective. In this case, the Southeast Asia region was chosen as the most granular present in the WEO 2020 scenarios. The global comparison is also given for context.

Figure 8. Technology Share. Power Generation – The left-hand plot shows the Global and the right shows Southeast Asia benchmark.



The most noticeable difference between the two benchmarks, global and Southeast Asia, is the absence of Nuclear in the latter. It follows that the scenario alignment target for the Malaysian banks does not require a build out in nuclear energy. This is due to the fact that the region does not have any nuclear capacity and hence it is not expected that the portfolio’s targets should build out in it. Rather, decarbonization efforts are made up from other low carbon technologies alternatives (hydro and renewables).

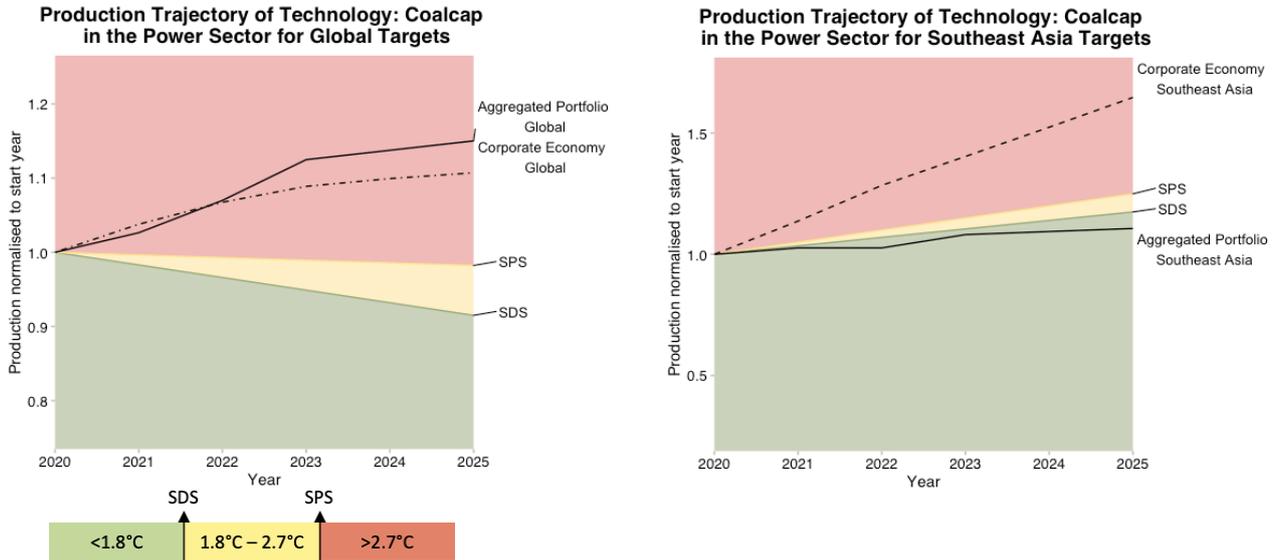
At both the global and Southeast Asia levels, the aggregated portfolio has a higher exposure to renewables in its power technology share. That being said, to be considered aligned with the SDS in 2025, more efforts are needed to shift their technology exposure to renewables. This is shown by the wider green section of the 2025 SDS compared to the aggregated portfolio in 2025.

Exposure to coal fired power generations is lower than the corporate economy benchmark at both the global and Southeast Asia regions in 2020 and 2025. However, the aggregated portfolio is misaligned to the SDS in terms of exposure to coal fired power generation.

The technology exposure to hydro, oil and gas fired power generation is relatively aligned, meaning that the main misalignment from a power technology mix point of view comes from coal fired power and renewable energy. Hence, the sample banks should shift their technology exposure out of coal fired power generation into renewable energies to be considered aligned with the SDS. This can be achieved through either capital reallocation from coal fired power companies into more renewable ones or through steering efforts with their respective clients to shift their technologies from coal to renewables in the real economy. The latter strategy would have the double benefit of not only decreasing the climate transition risk at the portfolio level but also contribution to the transition shift in the real economy if it leads to coal fired power being decommissioned and renewables being brought into operation. While the former strategy would satisfy de-risking the portfolio from a climate transition risk perspective, if the divested coal fired power plants remain in the real economy, then no claim about the contribution of the banks to real world emission reductions could be made.

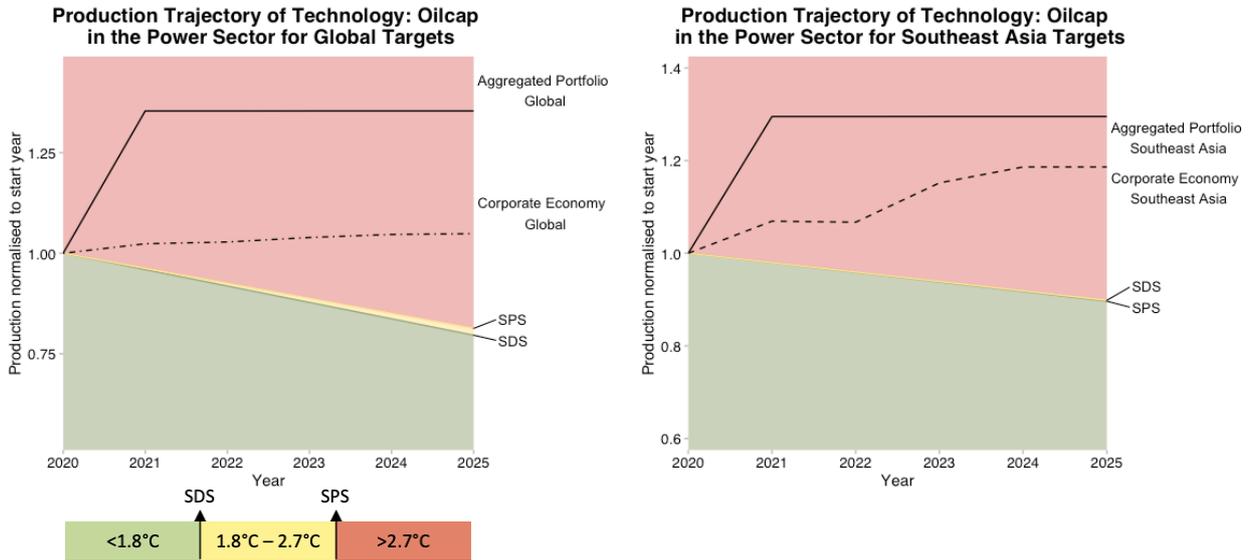
As with the oil and gas sector above, the technology mix metric only tells half the story – that is how the banks are exposed to different underlying technologies. It does not speak to the absolute production volume changes required from low carbon and high carbon technologies. For this we need to look at the next set of metrics – the production volume trajectories per technology.

Figure 9. Volume Production Trajectory. Power Generation – Coal Capacity. The left-hand plot shows the Global and the right shows Southeast Asia benchmark



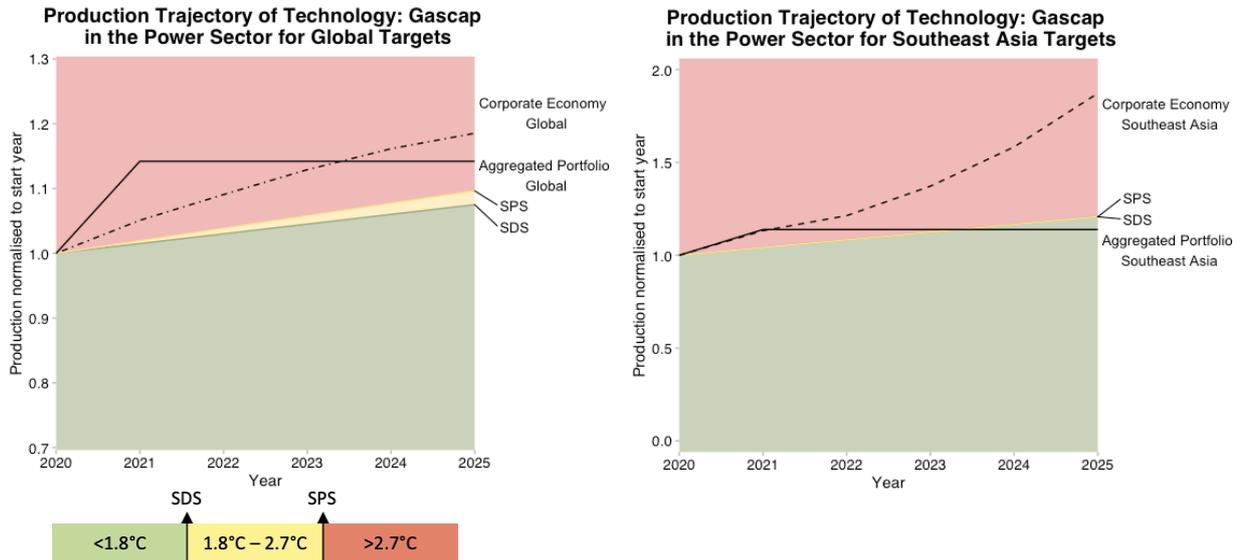
The SDS and SPS require a decrease in coal-fired power generation at the global level. In this context, the Malaysian bank’s client’s production is misaligned. They are increasing production at a rate faster than the global corporate economy, which is also misaligned, implying an exposure to climate transition risk. However, at the Southeast Asia scale, the scenarios allow for a slight increase in coal fired power generation. In this context, the banks’ exposure is considered aligned to the SDS. The total assets in Southeast Asia (the corporate economy) are significantly misaligned. This implies that the banks clients still increase their coal power production but at a level which is considered aligned with the SDS. The Southeast Asia corporate economy is aligned with a worse than SPS scenario.

Figure 10. Volume Production Trajectory. Power Generation – Oil Capacity. The left-hand plot shows the Global and the right shows Southeast Asia benchmark



In terms of oil-fired power generation, the scenarios are relatively constant between the two benchmark regions. The banks’ projection shows a rapid increase up to 2021, then production remains constant to the end of the time horizon. This is worse than the scenarios and the corporate economy in both regions. From the power technology mix above, we saw that the aggregated portfolios’ relative exposure to oil fired power generation was relatively aligned with the SDS. However, this graph shows that despite this, their production trend is going in the wrong direction, i.e. it is increasing when the scenarios require a decrease. It follows that to be aligned from a volume production trajectory perspective in the oil technology, the banks would have to be financing companies that are actively decommissioning oil-fired power generation. By not doing so, this graph would suggest an exposure to climate transition risk on these assets and hence incurred to the banks through their loans to companies operating said assets.

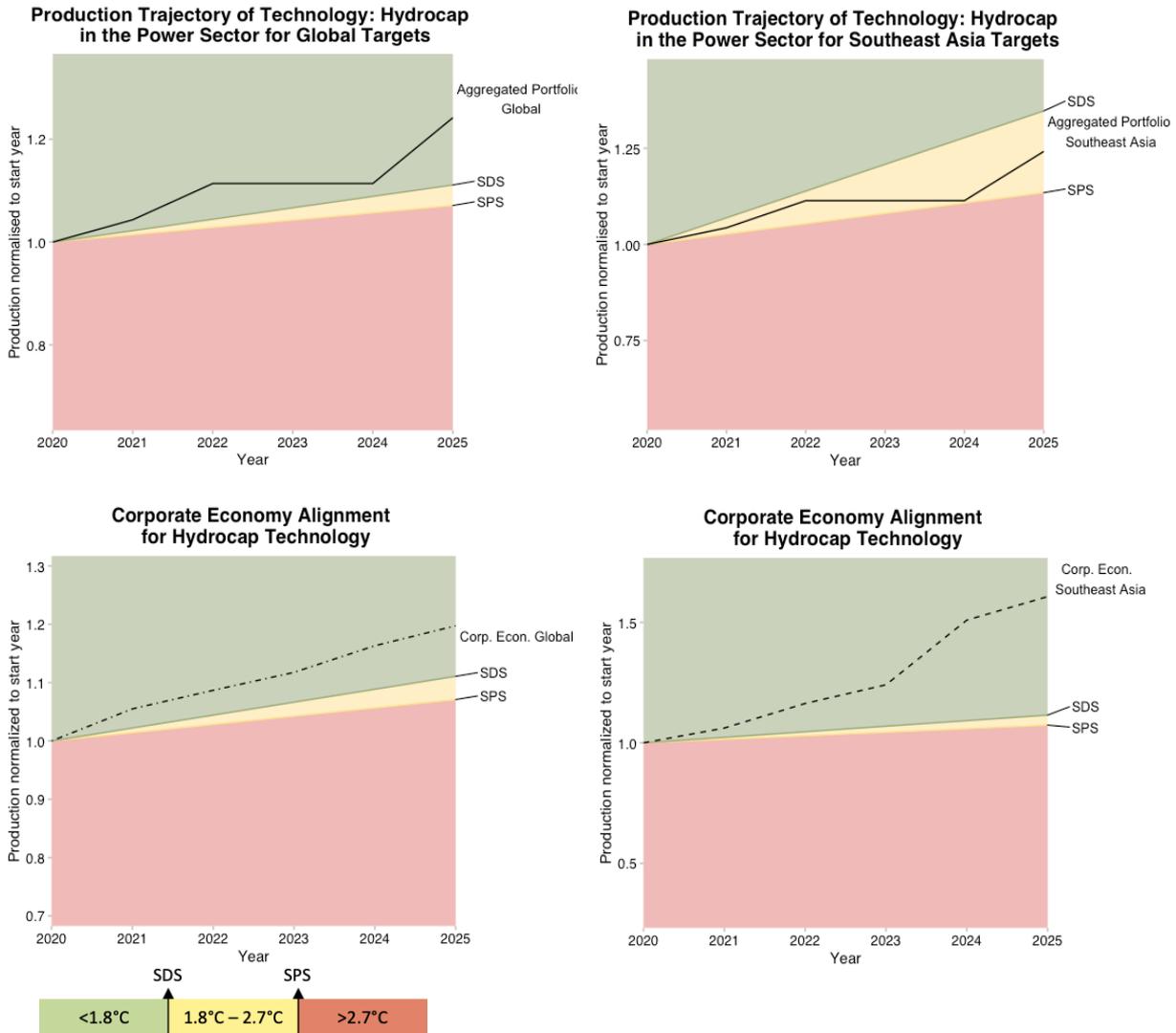
Figure 11. Volume Production Trajectory. Power Generation – Gas Capacity. The left-hand plot shows the Global and the right shows Southeast Asia benchmark



For gas-fired power generation at the global level the aggregated production trend is misaligned with both scenarios, but it performs slightly better than the global corporate economy which shows a steady rise in production.

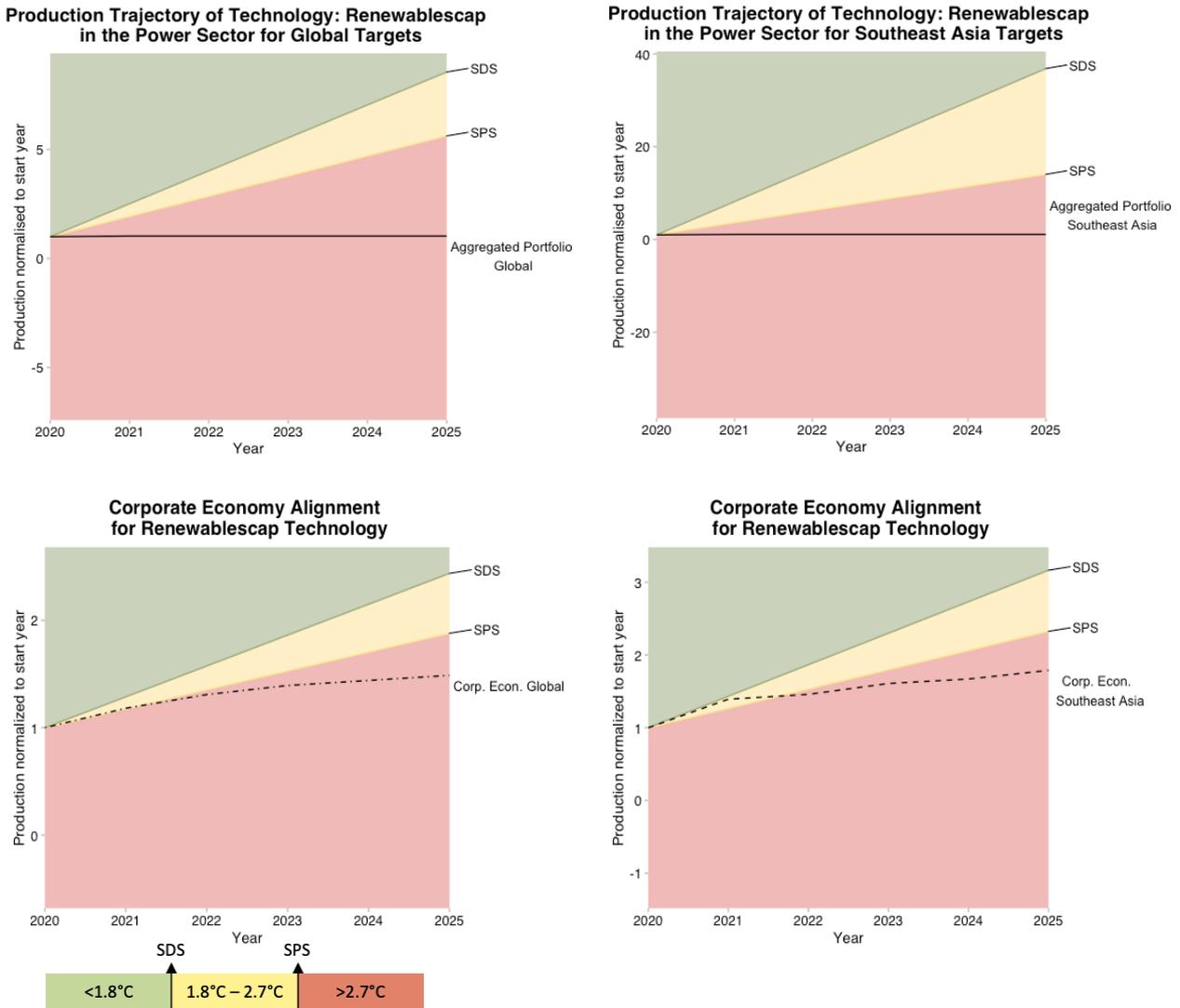
Despite this, in the Southeast Asian region the banks are considered aligned with the SDS. The Southeast Asian corporate economy shows a rapid increase in production, suggesting that the Malaysian banks are bucking the regional trend in this technology.

Figure 12. Volume Production Trajectory. Power Generation – Hydro Capacity. The left-hand plot shows the Global and the right shows Southeast Asia benchmark with the portfolio on the top and the corporate economy (market) benchmark on the bottom (*please see note below for the reason behind separate plots)



In both the Southeast Asia and global region, the respective corporate economies are aligned with the required build out in hydro power. The aggregated portfolio is aligned with the required build out in hydro at the global level as prescribed by the SDS. However, at the Southeast Asia region it is only aligned with the SPS. This implies that the aggregated portfolio is aligned with the NDCs and other stated policies of the countries in the Southeast Asia region but not aligned with the required build out need to be Paris agreement aligned, when defined by the SDS.

Figure 13. Volume Production Trajectory. Power Generation – Renewable Capacity. The left-hand plot shows the Global and the right shows Southeast Asia benchmark with the portfolio on the top and the corporate economy (market) benchmark on the bottom (*please see note below for reason behind separate plots)



In both the Southeast Asia and global region, the respective corporate economies are misaligned with both of the scenarios. This means that the required build out in renewables is not being made by the companies in the corporate economy.

The same is true of the Malaysian banks, whereby the required build out is not aligned with either scenario. The flat line implies that the banks have exposure to renewable power through their corporate lending but that the production capacity coming from these exposures is remaining constant over the next 5 years. This is not consistent with a pathway to keep global temperature raise to under 2°C. It is worth noting that the banks may have exposure to project finance of renewables, which would not be captured in this analysis, which focuses on corporate lending.

**Note – For low carbon technologies, two plots are needed as the corporate economy and portfolio have their own respective sets of climate scenario alignment targets. This is due to the way in which market share is defined for low carbon technology.*

For low carbon technologies, it is defined by the sector, meaning that the scenario alignment target is calculated using a “sector market share percentage” (SMSP) approach. The reason being that any power company needs to build out renewable power, regardless of whether they already have renewable power today. Whereas for high carbon technologies, it is defined by the technology, meaning that the scenario alignment target is calculated using a “technology market share ratio” (TMSR) approach. The reason being that only power companies with coal power can be expected to decline coal power (see annex of model formulization and description of this difference).

In practice, this means that the corporate economy’s alignment targets will be different to the portfolio’s alignment targets for low carbon technologies, as they have a different subset of companies with different power mixes, and therefore different targets. This is not an issue for high carbon technologies, as only companies with the high carbon technology are considered in the analysis.

It follows that a comparison between the portfolio and its alignment versus the corporate economy and its alignment can be made but a direct comparison between the portfolio and the corporate economy cannot be made. In other words, one can say that the portfolio is more aligned or less aligned to its own set of alignment targets compared to the corporate economy and its own set of alignment targets.

More information on this topic can be found [here](#).

Nuclear power

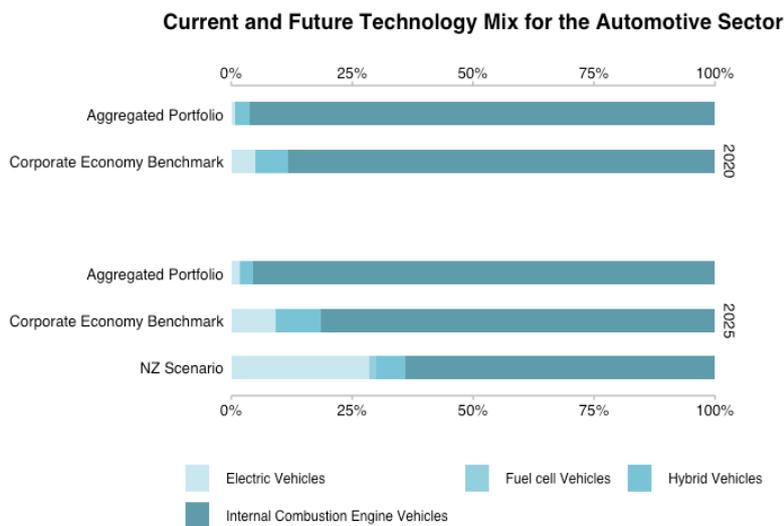
The selected banks in Malaysia do not have any exposure to nuclear hence it is not shown here.

3.b.iv) Automotive

For this sector, a comparison is made with a global Net Zero scenario and market (corporate economy) benchmark. Scenario is only available at the global level.

Note that the match success rate caveat documented on page 28 should be taken into consideration when interpreting the following results.

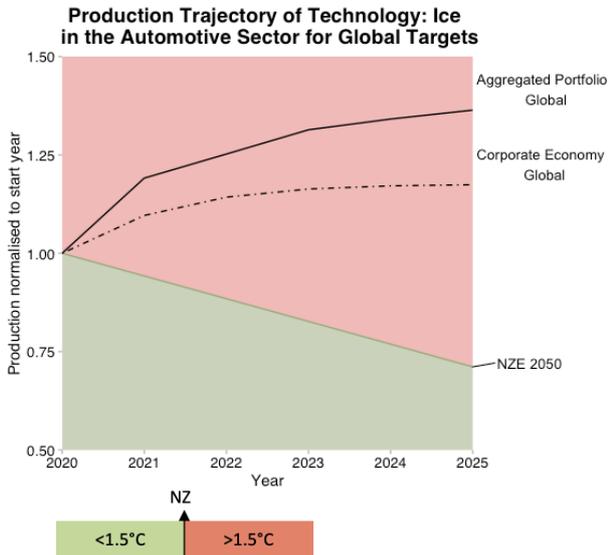
Figure 14. Technology Share. Automotive



The current technology mix of the aggregated portfolio is heavily dominated by internal combustion engines (ICE) with less than 5% hybrids and even less in electric vehicles (EV). The global share of electric vehicles and hybrids in currently higher than the aggregated portfolios. By 2025, the aggregated portfolios' exposure to electric vehicles increases very slightly in the automotive technology. This shift in technology share is slower than

the global corporate economies' which shows a faster shift in both EV and hybrids. This may suggest that the aggregated portfolio is exposed to a market risk through opportunity loss. Neither the aggregated portfolio nor the corporate economy is shifting their technology shares' at the rate required to be aligned with a net zero scenario in 2025, which requires a >25% share in EVs.

Figure 15. Volume Production Trajectory. Automotive – Internal Combustion Engines



In terms of production volumes of internal combustion engines, the aggregated portfolio shows an increase of over 25%. This is a steeper increase than the global corporate economy. Both the aggregated portfolio and the global corporate economy are misaligned with the required ~25% decrease needed to achieve net zero.

Automotive low carbon

In the case of Electric Vehicles, an average Malaysian bank, based on the sample of banks included in the study, is misaligned by 91% in 2025. In other words, by 2025 assuming no changes in the loan book composition or production plan changes of the underlying corporates, the average Malaysia bank will have achieved 9% of the required build out prescribed the IEA’s NZ scenario. In the case of hybrids, the misalignment figure falls to 64%. i.e., 36% of hybrid build out is achieved. In fuel cells, the misalignment figure sits at 98% meaning 2% of build out is achieved.³¹

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$$Average\ misalignment\ (\%)\ per\ technology = \frac{\sum\ banks\ (AP_{t5} - PT_{t5}) / PT_{t5} * 100}{number\ of\ banks}$$

AP = actual production

PT = production target

T5 = time in 5 years

Section 4. Ensuring just transition in Financing a Low-Carbon Economy in Malaysia

4.a) The social transition towards a low-carbon economy

Efforts towards decarbonizing the economy will have significant economic and social consequences, some of which will either exacerbate existing inequities or create new opportunities. The high carbon sectors such as power generation, coal mining, oil and gas, and auto manufacturing will be affected by the climate transition, leaving the assets stranded. Notably, physical assets are not the only risk we should be worried about. Stranding of human capital due to the shifting in environmental and energy landscapes may result in job losses, social injustices, and competitive disadvantage. However, the shift to a low-carbon economy also poses opportunities for economic transformation through the creation of new jobs in green sectors.

The Organization for Economic Co-operation and Development (OECD) demonstrates that blue-collar, farmworkers and low-skilled workers will be more impacted than other job categories such as managerial and professional workers.³² The most significant factors affecting this are the changes in business models and the adoption of new technologies and processes that pose issues for low-skilled workers whose skills are deemed non-transferable. Employment in high carbon sectors will also be impacted in terms of magnitude as the number of low-skilled workers in low carbon-intensive sectors is generally lesser than in the high carbon sectors, according to a study in EU countries by the International Labour Organization (ILO).³³ On the other hand, a study by McKinsey shows that 50 more jobs are created for every \$10 million invested in the renewable energy and energy efficiency sectors than in the fossil fuel sectors.³⁴ This presents both challenges and opportunities waiting to be unlocked.

The actors who are negatively affected by this transition will have an inclination to keep the status quo, rejecting the transitional idea to maintain carbon-intensive industries. These may include the shareholders, business owners, workers, and communities affected by the transition. The challenge

³²<https://www.oecd-ilibrary.org/docserver/ea3696f4-en.pdf?expires=1635508980&id=id&acname=guest&checksum=2897CBD06F05F9F6A0323B3E00B78DDC>. p.9.

³³ https://www.ilo.org/wcmsp5/groups/public/---ed_emp/---ifp_skills/documents/publication/wcms_564692.pdf

³⁴ <https://www.mckinsey.com/featured-insights/coronavirus-leading-through-the-crisis/charting-the-path-to-the-next-normal/can-a-low-carbon-recovery-agenda-create-jobs-and-help-the-economy>

is to ensure that the low carbon transition does not only contribute to climate goals but also addresses issues of inequities and justice for affected communities. Hence, a just transition strategy is essential in the formulation of plans to address resistance against the climate transition.

Additionally, gender-based inequalities must be noted in the climate transition. An estimation by the ILO found that on a global average, women earn only 77% of what men earn, and it would take 70 years to close the gender wage gap based on current trends. Concurrently, sectoral and occupational segregation contributes to gender gaps through differences in the number and quality of employment. Participation of women in the climate change agenda should be further fostered through their role as decision makers, professionals, employees, and consumers. On a positive note, the employment of women in the renewable energy sectors (at 32% of the workforce) is higher than in the fossil fuels sectors (at 22%).³⁵ Beyond issues of direct employment, women and vulnerable communities are over-represented in indirect and supportive roles to the fossil fuel sector and must be included in the scope of a just transition strategy. However, beyond issues of labour, the impacts of climate change will affect women and girls disproportionately, such as through limited access to infrastructure including energy, financial resources and decision-making avenues, and these impacts may be further magnified in vulnerable and indigenous communities. Hence, integrating gender lenses into just transition policy and programs are essential to ensure women's rights are protected and promoted.

“just transition” is a set of principles, processes and practices that ensure the shift from an extractive to a regenerative economy is just and equitable, redressing past harms and creating new relationships of power for the future.³⁶ The ILO published guidelines for a just transition strategy which covers key principles including the need for social consensus, adequate labour rights policies, strong gender dimensions in addressing environmental challenges and opportunities, coherent policies for the creation of an enabling environment, a just transition framework, customized policies and programs, and international cooperation among countries.³⁷

A number of initiatives on just transition financing and investment have been taken by major financial players globally. Nine Multilateral Development Banks (MDBs) around the world have jointly committed in supporting a just transition through financing and policy strategies of the developing member countries in their net-zero emission journey³⁸. The United Nations Principle for Responsible Investment (UNPRI)³⁹ has also published a guide on how investors may integrate just transition as part of their investment practices, in which more than 160 investors have signed the

³⁵ <http://sdg.iisd.org/news/irena-reports-that-strengthening-womens-roles-in-renewable-energy-is-key-to-achieving-multiple-sdgs/>

³⁶ https://climatejusticealliance.org/wp-content/uploads/2018/06/CJA_JustTransition_Principles_final_hi-rez.pdf

³⁷ https://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/documents/publication/wcms_432859.pdf

³⁸ <https://www.adb.org/sites/default/files/related/241521/Statement-MDBs-Just-Transition-High-Level-Principles.pdf>

³⁹ <https://www.unpri.org/download?ac=9452>

statement of commitment to the just transition. The guide provides some areas of recommendation for investors which include among others; (i) assessing exposure to the social dimension of the transition, (ii) integrating just transition factors in investor expectations for the corporate (through disclosure, benchmarking performance, etc.), and (iii) incorporating social dimension in the capital allocation.

4.b) Malaysia's path to carbon neutrality: challenges and opportunities

Malaysia has recently pledged to strong commitments to achieve their climate goals, one of these commitments are materialized through their pledge to no longer build new coal-fired plant power⁴⁰. As a replacement, cleaner energy generation such as gas power plants will be built to meet the national's energy demand.⁴¹ The financial institutions also took part in this effort where major banks in Malaysia including Maybank, CIMB, HLB, and RHB⁴² have recently committed to prohibit the financing of new coal-fired power plant projects in their portfolio.

While the Government of Malaysia has set a 40% target for renewable energy in the energy mix by 2035⁴³, Malaysia is still highly dependent on fossil fuels. In 2020, coal and natural gas made up 82% of the energy mix while renewable energy only contributed to 8%.⁴⁴ In the finance sector, between 2016-2020 alone, a total of USD 4.6 billion of loans and underwriting services were provided to companies engaged in coal sector by the financial institutions in Malaysia.⁴⁵ The government commitment to become a carbon neutral nation would require massive transformation in the energy sector which may pose the risk of job loss in the power sector and sectors highly dependent on energy. Nevertheless, this also translates to job creation opportunities for the renewable energy sector and other green industries.

Globally, the ILO's global sustainability scenario for 2030 estimates more than 24 million potential new jobs will be created which far outnumber the six to seven million jobs lost in the high carbon sectors. Five million workers who lose their jobs due to the climate transition will be able to find similar jobs in another industry. Further, based on IRENA's World Energy Transition Outlook, the renewable energy sector alone will employ 43 million people by 2050.⁴⁶ In Malaysia, according to

⁴⁰ <https://www.thestar.com.my/news/nation/2021/09/27/pm-malaysia-aims-to-be-carbon-neutral-by-2050-no-more-new-coal-fired-power-plants>

⁴¹ <https://www.mida.gov.my/mida-news/malaysia-focusing-on-increasing-renewable-energy-capacity/>

⁴² See Maybank Sustainability Report 2020 p.23, CIMB Sustainability Report 2020 p.8,

https://www.hlb.com.my/content/dam/hlb/my/images/About_Us/sustainability/hlb-bcb-esg-governance-policy.pdf,

<https://www.rhbgroup.com/files/others/highlights/20210622a.pdf>

⁴³ <https://www.mida.gov.my/mida-news/malaysia-focusing-on-increasing-renewable-energy-capacity/>

⁴⁴ [https://www.st.gov.my/ms/contents/files/download/169/REPORT_ON_PENINSULAR_MALAYSIA_GENERATION_DEVELOPMENT_PLAN_2019_\(2020_%E2%80%93_2030\).pdf](https://www.st.gov.my/ms/contents/files/download/169/REPORT_ON_PENINSULAR_MALAYSIA_GENERATION_DEVELOPMENT_PLAN_2019_(2020_%E2%80%93_2030).pdf)

⁴⁵ https://fairfinanceasia.org/files/media/base/FFA_A%20Future%20Without%20Coal-Banking%20on%20Asias%20just%20energy%20transition_2021.pdf

⁴⁶ https://www.ilo.org/global/about-the-ilo/newsroom/news/WCMS_823759/lang--en/index.htm

the latest data available, the extraction of crude petroleum and natural gas employs 36,776 workers⁴⁷ and manufacturing of motor vehicles employs 82,994 workers⁴⁸. These workers in the high carbon sectors are prone to be displaced due to economic restructuring in the upcoming years to achieve climate goals.

On a positive note, a recent study by the WWF and BCG Malaysia⁴⁹ estimated that the net job losses in Malaysia (114,000 job loss by 2050) will be much lower than the net job gains (369,000 job creation by 2050) from the net zero pathway. The potential job losses are mainly dominated by the losses in the Internal Combustion Engine (ICE) vehicle manufacturing and fuel value chain including refineries and fuel retail. Job creation opportunities primarily come from the manufacturing of electric vehicles and the adoption of renewable energy technologies including grid upgrades and power plants. To realize this potential, the just transition principle should be applied to ensure that the economic transformation from brown to green sectors can be facilitated to maximize shared prosperity in society.

To reach the aforementioned goals and attempt to cater to the different stakeholders, the government of Malaysia through the Twelfth Malaysia Plan 2021-2025 (RMK12) has pledged its commitment to advance sustainability as part of the three main themes under the plan. The theme focuses on advancing green growth, energy sustainability and transforming the water sector. The Twelfth Malaysia Plan also focuses on the promotion of social justice for the people. However, the social justice aspect focuses mostly on poverty alleviation, wellbeing of Orang Asli, enhancement of human capital development, etc. There is no mention of a just transition strategy as part of the climate transition plan. Thus, there is a need to integrate just transition strategy and initiatives in future national climate plans and policies.

Such formulation of just transition into national policies has been practiced by several countries⁵⁰. In the Philippines, for instance, the Philippines Green Jobs Act stresses the need to “pursue a just transition for all, job security for workers affected by the transition process, which drives economic prosperity, decent job creation, sustainable and resilient livelihoods and communities, poverty reduction and social justice.” The Act also lists 15 government departments and agencies involved in its implementation, demonstrating its whole-of-government approach.⁵¹

⁴⁷ *Annual Economic Statistics 2018: Mining of Petroleum and Natural Gas*

⁴⁸ *Monthly manufacturing statistics September 2021*

⁴⁹ https://www.wwf.org.my/our_work/climate_and_energy/towards_net_zero_emissions_by_2050/

⁵⁰ *including the EU, the UK, France, Canada, and New Zealand among others*

⁵¹ <https://www.dole.gov.ph/news/department-order-180-17-implementing-rules-and-regulations-of-republic-act-no-10771/>

While the government bears the responsibility to create a regulatory framework for a just transition strategy, the private sector should also actively participate. In this regard, the financial sector has an important role to ensure that the low-carbon transition by their clients is conducted in a just manner. The newly launched industry led initiative of financial institutions in Malaysia, the Value-based Intermediation Financing and Investment Impact Assessment Framework (VBIAF) sectoral guide⁵², directs financial institutions to encourage prioritization of an equitable and justice-based energy transition for their clients, aligned with international frameworks such as the ILO. The just transition element is integrated as part of social risk identification of clients during the due diligence process in the VBIAF sectoral guide.

That said, Malaysia is at the early stage of its journey towards a climate neutral nation by 2050. Hence, it would be crucial for the nation to integrate a well-planned just transition strategy to help curb the negative impacts of the needed economic transformation to achieve the intended climate goals.

⁵² <https://aibim.com/contents/upload/VBISG-OIL-AND-GAS-Public-Consultation.pdf>

Section 5. Recommendations

This section builds on the experience of running the PACTA for Banks exercise with a sample of Malaysian banks.

It makes suggestions on:

- a) How other banks in the region should run the PACTA exercise.
- b) How the tool itself can be improved, i.e., identifying areas of further research.
- c) Practical recommendations on what a bank can do with their PACTA results. i.e., identifying actionable next steps towards risk management and emission reductions in the real economy through specific use cases.
- d) Incorporating just transition considerations into climate action plan

5.a) Recommendations on implementing PACTA for Banks for Malaysian banks

This section covers recommendations and practical steps of applying PACTA for banks that want to use the tool. As there is optionality within the PACTA methodology, this section looks to suggest specific options for Malaysian users.

Malaysian banks should:

- i. **Measure the alignment of their loan books.** Banks can use the free and open source PACTA for Banks tool, which can run in conjunction with additional climate metrics (for example, carbon foot printing exercises for the bank and their clients (Partnership for Carbon Accounting Financials (PCAF)) and setting targets (Science Based Targets initiative (SBTi)). Full documentation and access to the PACTA for Banks methodology and supporting tool kit can be found [here](#).
- ii. **Use regional benchmarks.** In using PACTA for Banks, Malaysian banks should use regional benchmarks where possible. For example, Southeast Asia instead of the global scenario target.
- iii. **Measure alignment to a Paris aligned scenario.** Malaysian banks should always measure alignment to at least one <2°C scenario and ideally one 1.5°C scenario. Scenarios that include regional Nationally Determined Contributions (for example the IEA'S WEO SPS) should also be considered, however they should not be considered as Paris aligned if the scenario provider does not deem them ambitious enough to align with a less than 2°C world.
- iv. **Match loan book exposures to the real economy at the direct loan taker level.** Malaysian banks should match exposures at the direct loan taker where possible and failing that at the ultimate parent level. The direct loan takers are considered closer to the operation of the assets underpinning the analysis. This is where steering efforts may be more meaningful and

where climate transition risks are more acute. As financial data granularity is not perfect, cases may arise where matches between the real economy and the banks loan book will have to be made at the ultimate parent level. Banks are encouraged to document the “match success rate”⁵³ at each level.

- v. **Repeat the exercise annually to track progress.** Malaysian banks are encouraged to repeat the PACTA exercise yearly to monitor portfolio alignment progress against climate targets.
- vi. **Maintain temporal consistency between scenarios, loan book and real economy production data.** Malaysian banks should keep the data vintage of the loan book, the scenarios and the real economy production data consistent where possible. For example, if the loan book is dated as of Q4 2020 then 2020 scenarios should be used with production forecasts from 2020. This maintains a comparable data universe and allows for consistent comparison should the exercise be repeated year on year.
- vii. **Use a portfolio weighted approach for results at the portfolio level.** When creating portfolio level results banks are recommended to use a “portfolio weighted allocation approach”. This is inferred as being risk intuitive as it represents the capital allocation decision made by the portfolio managers to specific clients. At the client level an unweighted allocation approach is recommended as it captures the full (mis)-alignment of the company.
- viii. **Measure alignment against all PACTA sectors prioritizing based on materiality to the bank.** Banks should measure alignment against all PACTA sectors but prioritize in order of climate relevance and materiality to their loan book. Carbon accounting methodologies such as PCAF can be useful to identify key carbon hotspots.
- ix. **Disclose alignment results publicly.** Banks are encouraged to disclose their results in sustainability reports. In doing so banks are encouraged to disclose the following information: (This will help form a transparency point of view - allowing for comparisons to be made between banks and for the same bank between years.)
 - Match Success Rate – (see page 28)
 - Scenarios used
 - Region considered
 - Financial variable used in the portfolio results weighting

⁵³ Match success rate – the % by loan size and/or company number of in -scope companies that were matched with the ABCD. When using the Asset Resolution free data set this is on average over 80%. The difference between Direct loan taker and ultimate parent can vary dramatically between banks.

- Data provider of the production forecasts
- Loan book data year and quarter. E.g. the exposures were taken as of Q4 2020

5.b) Recommendations on improvements to the PACTA for Banks tool

- Develop and include more granular scenarios** – To date⁵⁴, the most granular scenario available in the PACTA for Banks tool kit is at the Southeast Asia region. Third party scenario providers should provide more regional scenarios, for example at the country level. As and when more granular scenarios are available, they should be included in the PACTA for Banks tool kit.⁵⁵
- Enhance matching software in the PACTA for Banks toolkit** – lowering implementation time when matching production forecasts to loan books. The addition of unique identifiers per listed and unlisted companies that are recorded on banks loan books and available for companies via financial data set are needed.⁵⁶
- Sectoral decarbonization pathways (sector technology roadmaps) for industry sectors** – To allow for the use for production volume trajectory and technology mix metrics in these sectors (steel and cement).
- Improve financial asset coverage** – For example, project finance and underwriting.
- Improve sectoral coverage** – For example, real estate and agriculture.

5.c) Recommendations on implementing PACTA for Banks for specific Use Cases.

The PACTA for Banks methodology measures the alignment of a loan books' exposures to climate scenarios. PACTA is an open-source methodology in which individual banks may use their results as they deem fit and infer their own use cases. The following section sets out potential use cases that can be derived from such alignment assessment. Further research is needed into each suggestion, but this does not prevent a bank from pursuing any suggested use cases.

Malaysian banks are encouraged to contribute to this collaborative and iterative process.⁵⁷

⁵⁴ At time of writing (Q4 2021)

⁵⁵ Any users that want to include new climate scenarios in the tool kit should contact banks@2degrees-investing.org with their suggestions.

⁵⁶ Any users aware of such identifiers are encouraged to contact banks@2degrees-investing.org with their suggestions.

⁵⁷ They can contact banks@2degrees-investing.org should they wish to collaborate on further research or publish use case-based case studies.

i. PACTA and its use in risk management:

Climate transition risk can be inferred at a qualitative level from the PACTA results. In other words, if you are misaligned with a Paris aligned climate scenario, this implies that you are exposed to transition risk. In the case of low carbon technologies, misalignment implies that the portfolio is not benefiting from potential climate transition opportunities. It follows that the inverse is also true. If a portfolio is aligned with a Paris-compatible scenario then it will be less exposed to transition risks, while benefiting from climate transition opportunities. Banks can integrate PACTA results into their own internal risk models and frameworks.

A qualitative assessment of deviation from the market can also be inferred through comparison to the market (corporate economy) benchmark. For example, if the corporate economy is increasing a low carbon technology at a much faster rate than the portfolio, this could imply that the portfolio is missing out on market share in growing technologies. In other words, that it is not benefiting from opportunities presented by the transition to the low carbon economy.

The outputs of the PACTA analysis, namely bottom up forward looking production forecasts at the technology level per client, can also be used as an input into climate transition risk stress tests. Such models can allow a user to infer transition risk at a quantitative level through outputs such as discounted cash flows, probabilities of default and expected losses.

Banks can use their own models to make sense of the quantitative impact the companies' misalignment may have on their loan books by plugging in the company production projections, their scenario-based targets, relevant financials, and assumptions about the transition, such as a sudden policy shock.

Alternatively, they can use a climate transition risk stress test model created by 2DII. This will seamlessly work with PACTA type outputs, by extrapolating the production build out of companies beyond the known 5 years based on business-as-usual scenarios taken from climate models. Shocks can then be applied that represent the transition to the low carbon economy, indicated by Paris aligned scenarios and accounting for previous misalignment. Such shocks can be considered as late and sudden transitions as opposed to slow and steady ones. The latter would be represented by a company following a Paris aligned scenario from the beginning. Inputting this data will generate different company valuations based on the discounted cash flows of the business-as-usual and the late and sudden shock scenarios. These are fed into a Merton credit risk model to obtain changes in the probabilities of default and expected losses. By iterating over the input parameters, banks can apply multiple shocks and generate sensitivity analyses.

2DII's Climate Transition Stress Test model has been road tested with the sample banks and is expected to be publicly available in the first half of 2022 as an open-source tool via Comprehensive R Archive Network (CRAN). It is currently available as a beta version via GitHub and open for further road tests.

ii. PACTA for setting targets and monitoring progress:

While PACTA is not a target setting methodology in itself, it can be used to set forward looking scenario alignment targets per sector. Furthermore, progress towards such targets can be tracked by repeating the PACTA analysis year on year. Further research is needed into how PACTA can be used as a target setting methodology and questions remain open on how to compare results between years consistently.

The integration of PACTA into target setting methodologies such as the SBTi is an open area of research. An example of how PACTA has been used by a major international bank to set climate scenario alignment targets can be found in ING's Terra report ([here](#)).

iii. PACTA as a way to help take and monitor climate actions:

PACTA results at the company level can help a bank identify clients with the strongest misalignment, i.e. the clients that drive the misalignment at the portfolio level and are driving the banks' climate transition risks. It follows that banks can take actions at the portfolio level and with the individual clients to help steer the real economy towards climate goals.

2DII's Climate Impact Management System (CIMS), available [here](#), can help banks (and financial institutions more broadly) to design a scientifically sound climate contribution strategy.

CIMS guides financial initiations through the following steps:

- Selecting a relevant climate action to implement (a repository of potential climate actions can be found in the Climate Action Guide (CAG) ([here](#)))
- Understanding the alignment/positioning of the portfolio and clients being targeted by the action, using tools like PACTA and other company level assessment tools such as the ACT initiative ([here](#))
- Building an action plan and implementing the climate action
- Tracking the results of the implementation by reassessing the portfolio – using PACTA or other company-level tools.
- Disclosing results in a transparent manner

iv. PACTA for use in reporting and disclosure:

PACTA results can be used in sustainability reporting based on the TCFD recommendations as regards the use of climate scenario analysis by financial institutions. As PACTA is comparing the forward-looking trajectory of financed activities in climate relevant sectors against different climate change scenarios it meets this recommendation from the TCFD. The TCFD-initiated Portfolio Alignment Team (PAT) has developed recommendations on how banks should measure the alignment of their portfolios. PACTA is a tool that can aid banks in meeting these recommendations. Note that this work has since been transferred to the

Glasgow Financial Alliance for Net Zero ([GFANZ](#)). More specific guidance on the compatibility between different initiatives exists as an area of further research.

The disclosure of a bank's portfolio alignment within sustainability reports is a powerful tool for banks to communicate to their stakeholders including shareholder, customers, regulators and public on their climate positioning. PACTA offers a method in which this can be done in a forward looking and transparent manner.

Box 3. Intro to PACTA Coordinated Projects (COP)

Since the Paris Agreement, nationally coordinated assessments have taken place or are ongoing in 16 countries as well as at EU level. By the end of 2021, over 2,600 financial institutions will have been involved in these projects and over €11 trillion in assets analyzed.

Coordinated national assessments can be subdivided into three different types of exercises:

- **Government exercises:** These are coordinated projects that are typically led by the Ministry of Environment or the Ministry of Finance. To date there are 8 government-led exercises completed or ongoing.
- **Supervisory exercises:** These are exercises led by a country's central bank and/or financial supervisor. These have been conducted in 5 countries, at state level in the United States in California and New York State, and at EU level. Note that sometimes these run in parallel to government-led exercises.
- **Private sector exercises:** These are coordinated projects led by industry associations and have been implemented in 4 countries.

While each of these exercises have their own discrete application plan and process, they all share a set of common features. They all are 100% comparable analysis across financial institutions' portfolios for a discrete set of asset classes and climate-related sectors. Moreover, they provide for an aggregated understanding of the alignment/misalignment with climate goals of the financial sector across these asset classes and sectors.

While climate alignment measurements play an important role for climate progress, they only represent one part of the equation. The PCAF initiative has helped over the past years to create a global standard around Greenhouse Gas Reporting for financial institutions ('financed emissions'). The NGFS is helping to harmonize stress-test exercises across financial supervisors. The TCFD is driving harmonization of disclosure standards. Only when these different initiatives work in concert can they achieve their full potential.

More information on PACTA COP can be found [here](#).

Interested parties can contact: pactacop@2degrees-investing.org

5.d) Recommendations on incorporating just transition considerations into climate action plan

A just transition strategy is important to ensure that those affected will receive necessary protection and capacity rebuilding throughout the transition journey. The following recommendations are proposed to both the private and public sector to facilitate a just and equitable transition:

i. **Conducting social dialogue between all the affected parties**

Through social dialogue, the government, businesses, workers and civil society groups can collaborate within the sphere of national, industry and community policy and planning process to achieve a just transition to zero emissions. The social dialogue will bring policy coherence to ensure that climate action also means job creation and community renewal. It allows us to bring together industrial strategy, innovation, deployment of clean technologies and investment in green infrastructure, along with the measures we need to smooth out the transition: Social protection, skills training, redeployment, labour market policies, respect for land and community rights and community development. Workers' involvement is critical in this case, emphasizing the importance of forming trade unions to advocate for their rights and bargain collectively, and including these unions in dialogue. Furthermore, this dialogue should begin to be conducted years in advance in order to secure an orderly transition.

ii. **Bridging the skills gaps to minimize employment gaps**

Transitioning from one (non-green) job to another (green) job requires retraining and re-skilling of the workers, including those who are directly and indirectly affected by the transition. Hence, it is important to identify in advance what skills are required for green jobs and which sectors and occupations will require the most re-training. The government of Malaysia in collaboration with the industry should invest in and ensure equitable access to programs and measures to help vulnerable workers as a result of transition. This may include the facilitation of job transfer to new companies, establishment of on-the-job training programs, centralization of training and education for the green jobs, etc.

iii. **Requiring the disclosure of employment risks and just transition plan to address them**

The industry should be encouraged to disclose the employment risks aspect as part of their climate-related disclosures and plan to conduct a just transition strategy for the affected workers in case of a change in a business model or other climate action. This disclosure will also help to provide data for other stakeholders such as to support policy making and determining the effective just transition support for the industry. Such transparency will also open dialogue and alleviate fear, particularly among those who believe that the green transition will jeopardize some of the segments in the society.

iv. **Enactment of just transition policies and mainstreaming it across climate policy**

It is essential that just transition principles are codified clearly in regulation as well as mainstreaming it in the climate-related policy. Formulating the just transition strategy in the

policy is needed to provide a clear expectation, guidance, and monitoring mechanism for a fair transition. The just transition strategy may be formed as a standalone act or integrated in the existing and upcoming climate change policy in Malaysia.

v. Investment in sectors which can absorb high low-skill employments

The public and private investments may also be directed to sectors which provide high job creation potential. Nature-based solutions offer a huge potential of job creation while simultaneously protecting nature and mitigating the climate change. According to an ILO and WWF report, there are a number of job-intensive sectors which are part of the nature-based solutions that can be explored including reforestation, ecosystem or watershed rehabilitation and restoration, indigenous forest management, agroforestry, management of invasive species, etc.⁵⁸ The report stipulates that these nature-based solutions activities may create up to 750 jobs per US1 million investment in developing countries. Investments may be directed to these job creating activities where the region excels to accommodate workers laid off from the high carbon sectors.

vi. Establishment of a just transition Fund

A just transition Fund is designed to assist fossil fuel and high-emission industries in preparing for the transition. The Fund will assist activities such as investments in small and medium-sized businesses, research and innovation, renewable energy, emissions reduction, clean energy technology, site regeneration, and worker upskilling and reskilling. One model that can be replicated is the European Union's practice of just transition Mechanism (JTM).⁵⁹ The EU's JTM has targeted to mobilize EUR 150 billion for public and private investment. The JTM is mobilized through three pillars: just transition Fund which provides primarily grants, just transition scheme under InvestEU for private investment, and a public sector loan facility⁶⁰.

vii. Embedding just transition criteria in financing and investing decision

Financial institutions should proactively include just transition criteria as part of client's and investee's due diligence process as well as engaging them in their just transition strategy. This may include providing clear expectation around just transition from the corporate clients, incorporating workforce and community issue in the climate-related engagement, requiring corporate clients to have a just transition strategy, etc. Etica Sgr, an Italian

⁵⁸ https://www.ilo.org/wcmsp5/groups/public/---ed_emp/documents/publication/wcms_757823.pdf

⁵⁹ https://ec.europa.eu/commission/presscorner/detail/en/qanda_20_931

⁶⁰ https://ec.europa.eu/info/sites/default/files/eu_regional_and_urban_development/contact/presentations/presentation_day_2_-_introduction_to_the_jtm.pdf

sustainable and responsible mutual fund, have started embedding the just transition agenda into its investment strategy⁶¹.

See below box 4 and 5 for case studies on just transition.

⁶¹ <https://www.unpri.org/pri-blog/incorporating-the-just-transition-in-climate-engagement-an-example-from-italy/7973.article>

Box 4. Case Study: The Ruhr Region Coal Industry Transformation

What was the condition before and what drives the changes?

With close to 500,000 people employed in the coal mining industry in the 1950s, the Ruhr region historically relied on coal mining, coal power generation, and coal-based heavy industries. Coal mining began to lose its economic viability as production became more expensive and time-consuming. As a result, more than 30 big mines were closed by 1963, with many more closing in the decades after. The German government finally decided in 2007 that it will phase off subsidies and close the final hard coal mine by 2018. By 2007, the Ruhr region employed over 24,000 coal miners, accounting for almost three-quarters of Germany's mining workforce.

What method was taken for the just transition?

Top-down structural policies and limited consultation with local players characterized the Ruhr region's transition from coal in the early stages. Industries were hesitant to acknowledge that the coal mining industry was collapsing and continued to pour money into it. Similarly, trade unions urged the government to keep coal subsidies in place. Only in the late 1980s and 1990s, a bottom-up approach (known as regionalized structural policy) was taken where local players were empowered to implement projects such as the Internationale Bauausstellung (IBA) Emscher Park eco-tourism site. A 2007 tripartite agreement signed between coal corporations, representative trade unions, and federal and state governments marked the next stage of the transition as response to the government pledge to phase out coal by 2018. Some of the steps taken to ensure just transition in the agreement are as follows: Early pension programs for the elderly, career transition options for younger employees, and the so-called "eternal" charges, which amount to around €220 million each year, totaled €17 billion.

- Opportunity to transfer to other energy jobs within the same company accompanied with a retraining.
- Training and on-the-job certification programs.
- Transfer of workers into the service sector, such as at Dortmund Airport and in health care
- Establishment of new universities and technical colleges, environmental clean-up programs, new leisure and cultural businesses including eco-tourism, were successful in decreasing job losses and laying crucial foundations for future improvements.

What is the outcome and the lesson learned?

Ruhr's last coal mine was closed in 2018 and transformed from the center of the coal mining industry into a hub of green industry and cultural landscape. One key take away from Ruhr's experience is to ensure the key actors involved are on-board with the transformation. Rather than embracing and investing in the transition early on, the players were keeping the industry alive with all means even at the expense of the taxpayers. A whole-of-nation and whole-of-industry approached is needed for a just transition.

Source:

Germany: The Ruhr Region's Pivot from Coal Mining to a Hub of Green Industry and Expertise, just transition to climate neutrality: Doing right by the regions,

Box 5. Integrating just transition Strategy into Corporate Engagement:

A case study by Etica Sgr, Italian Fund management company

Etica Sgr, an Italian fund management company, signed the “Statement of investor commitment to support a just transition on climate change”¹ in 2018 coordinated by the UN PRI. The statement of commitment which was endorsed by 116 investors representing USD 10.2 trillion asset focuses on integrating just transition strategy into one of the following areas of investment; investment strategy, corporate engagement, capital allocation decisions, policy promotion and partnerships, and learning & transparency. Etica Sgr aimed to start with the second area to integrate just transition strategies into their corporate engagement agenda. This engagement started in 2019 for their new Etica Impatto Clima fund, a balanced fund focuses on the development of a low carbon economy.

As part of this corporate engagement, Etica Sgr developed a set of questions on just transition for their investee companies as part of the ESG analysis. The questions focus on the workforce issues such as potential layoffs from the companies’ climate transition plan and any action taken to avoid the negative impact from it. Etica Sgr circulated these questionnaires to their investee companies and received answer from 17 companies from different sectors and countries. The investee companies are then scored based on their answer to these questions.

The result shows that utilities and energy sector companies scored ten percent higher than the rest of the sectors. This shows that sectors facing highest transition risk are more prepared in climate transition and have measures taken for a just transition plan. Most of the companies declared to have a general commitment of avoiding lay-off and developing re-training programs for their employees during the transition. While only few companies adopted early retirement plans.

Such questionnaire is useful for Etica Sgr to communicate investors’ expectation on just transition to their investee, collect data on actions taken by their investee as part of a benchmarking process, and improve their corporate engagement approach on just transition topic in the future.

Source:

<https://www.eticasgr.com/en/storie/insights/just-transition-low-impact>

<https://www.unpri.org/pri-blog/incorporating-the-just-transition-in-climate-engagement-an-example-from-italy/7973.article>

Annex

Allocating required efforts from climate scenarios to banks' loan books:

Market share approach

To allocate scenario efforts, the market share approach is applied. This approach is different for green technology and for brown technology. For brown technology, all companies should adopt a similar effort of the production thanks to the following formula:

$$p_i^{tmsr}(t) = p_i(t_0) * \frac{s_i(t)}{s_i(t_0)}$$

where:

- $s_i(t)$ is the scenario production for technology i at time t ,
- $p_i(t_0)$ is the production allocated to the portfolio for some technology, i at time t_0 , and
- $p_i^{tmsr}(t)$ is the portfolio-specific target production for that technology.

For green technology, the efforts required depend not only on the production the company will have in technology. In fact, at the end of the transition, all companies should have some green technologies, even if they do not have them at the moment of the analysis. Effectively, in this approach, the methodology will ask a more important effort to a company that has a significative exposure to brown technology as this company will have some plants to replace. The target will be calculated using the following formula:

$$p_i^{smsp}(t) = p_i(t_0) + P(t_0) * \left(\frac{s_i(t) - s_i(t_0)}{S(t_0)} \right)$$

where:

- $P_i(t_0)$ is the portfolio's total production in the sector at t_0 , and
- $S(t_0)$ is the scenario total production at t_0 .

Please refer to the following blog post for more information [here](#)

Sectoral Decarbonization Approach

This approach is differentiated from the convergence approach in which all companies must target the mix of technologies of the scenario. The market share approach is often challenged because it will still ask for some efforts from the pioneer in the transition, such as Tesla. In the market share approach, some increased production is still asked of companies that will be 100% green technology

producers. These efforts are necessary to achieve climate goals, and companies that address climate challenges first are expected to continue to contribute.

However, the convergence approach is used to calculate emission intensities because, In this case, a company that has the best technology in the market can decrease its emission intensity in the same way as a company that has some inefficient assets. The convergence approach used is based on the SBTI's Sectoral Decarbonization Approach (SDA). This approach assumes that all companies should have the same emissions intensity at the end of the transition. The emissions intensity target is derived as follows:

$$I^{Target}(t) = (d * p(t)) + I^{Sc}(2050)$$

where:

$$d = I^{Co}(t_0) - I^{Sc}(2050)$$

and

$$p(t) = \frac{I^{Sc}(t) - I^{Sc}(2050)}{I^{Sc}(t_0) - I^{Sc}(2050)}$$

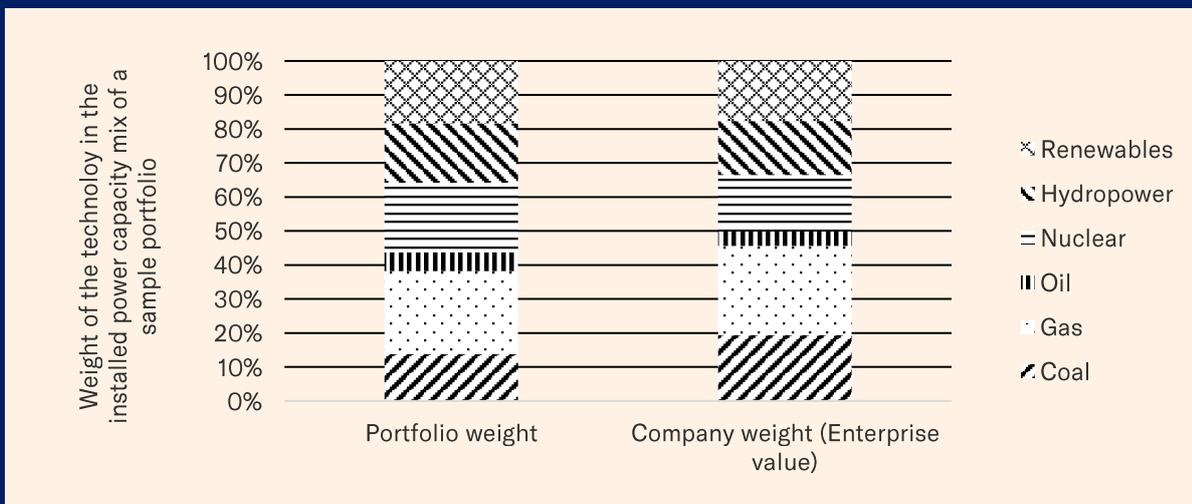
Allocating company production to the loan book financing it

Portfolio-weight approach. This approach allocates economic assets based on the weight of the financial asset in the portfolio. In debt values, when using book value, it represents a proxy for capital allocation decisions. For equity, this logic does not apply. See box 6 below for more details.

Box 6. Discussion on the Portfolio-Weight Approach

The portfolio-weight approach consists of **allocating economic activity based on the weight of the company in the portfolio**. It is the approach chosen in the ESG ratings of both MSCI and Morningstar/Sustainalytics, as well as the climate ratings of ISS-Ethix/CDP.¹ This approach is generally used to weight normalized or scored indicators rather than allocating absolute climate units, as it represents the relative weight of different scores or intensities in the portfolio.

While the ownership approach described above can be said to be more intuitive for equity portfolios, the **portfolio weight approach** is more intuitive for credit portfolios, since it can be said to represent the capital allocation decision of the relationship manager behind the portfolio. In other words, the portfolio value of a credit instrument, as measured in book value, can be said to represent the capital allocation of the portfolio manager. Another factor that speaks for the portfolio weight approach is the **more intuitive link to financial risk**. While out of scope, accounting based on portfolio weight allows for a representation of the size of the exposure of the portfolio to the company in terms of overall ‘capital at risk’/capital invested (a function of the portfolio size and weight of the company). However, this approach is not well suited to a production-volume metric and is not recommended – it should only be used with caution in this instance.



Fuel mixes of a portfolio on two different allocation rules, based on Bloomberg and GlobalData (in other examples, the two can differ from one another more significantly (Thomä, Dupré and Hayne, 2018)

¹ (Thomä, Dupré and Hayne, 2018)

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