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Petroleum Resources Management System 2018

Feedback on proposed update

About ClientEarth and Carbon Tracker Initiative

ClientEarth is an international non-profit environmental law organisation headquartered in London. Our Accountable Finance team focuses on the legal implications of climate change and other environmental issues for a wide spectrum of market participants, including banks, companies, investors, directors, professional advisers, stock exchanges and regulators.

Carbon Tracker Initiative is an independent financial think tank that carries out in-depth analysis on the impact of climate risk and the energy transition to help markets and state actors align capital allocation with the finite carbon budget predicated by the need to keep global warming within 1.5°C.

This document responds to the call for public comments in relation to reform of the 2018 Petroleum Resources Management System (**PRMS**) issued by the Oil and Gas Reserves Committee (**OGRC**) of the Society of Petroleum Engineers (**SPE**).

We welcome further discussion with the SPE on any of the topics below. For any follow up questions, please contact Robert Clarke (rclarke@clientearth.org) or Amy Owens (aowens@carbontracker.org).

Summary

PRMS was developed to provide "*consistent and reliable definition, classification, and estimation of hydrocarbon resources.*"[1] The OCRC is committed to "*maintain the definitions and guidelines* [provided in PRMS] *to keep current with evolving technology and industry requirements.*"[2] However, the resource and reserves estimations provided under PRMS are currently blind to the impact of climate-related matters on the viability of reserves and have failed to 'keep current' with climate science and the energy transition. If PRMS is to remain a relevant and credible framework, reform is needed.

The SPE's own Climate Change Task Force recognises the current limitations of the SPE's ability to ensure that climate constraints are adequately taken into account through PRMS evaluations, stating:

> *"Given that SPE does not have technical expertise or mandate for assessing climate science or guiding policy, the Task Force does not recommend that SPE develop a public position statement on climate science and climate change."*[3]

This is an existential problem for the credibility of the current PRMS framework. PRMS is effectively endorsed or relied upon in law, regulation and accounting standards in a number of contexts.[4] If PRMS is unable to evolve adequately to address the implications of the energy transition for the viability classification of reserves, then any legal, regulatory and accounting reliance upon the system may (rightly) be called into question. Securities and other regulators have their own legal mandates to protect investors from detriment and ensure that markets are stable and function well. Allowing climate-related risk to accumulate through reliance on outdated and unbalanced reserves estimation methodologies is anathema to such mandates, and regulators could choose to respond by evolving their own expectations and requirements in relation to the consideration of climate-related matters over coming years.

In addition, there is a clear trend in the development of global sustainability reporting standards which require disclosure of locked-in or embedded greenhouse gas emissions, and sensitivity analysis of fossil fuel reserves against authoritative climate scenarios.[5] Meanwhile, accounting and audit standard setters have stressed that climate-related matters must be taken into account in financial accounting and audit today, under existing standards, including in relation to asset valuations and impairments.[6] In a separate but connected legal context, English planning law is developing to require the downstream greenhouse gas emissions that will inevitably arise from the combustion of fossil fuels (and their effect on the climate)

[1] Petroleum Reserves and Resources Definitions (spe.org).
[2] See p.iv of PRMS 2018.
[3] Climate Change Task Force Recommendation (spe.org).
[4] For example, PRMS is one of three international frameworks which oil and gas companies may use when providing information on their resources and reserves to prospective investors in their prospectuses under UK rules, see: para. 133(i)(c) and Appendix I of Primary Market Technical Note 619.1: Guidelines on disclosure requirements under the Prospectus Regulation and Guidance on specialist issuers (fca.org.uk).
[5] The climate disclosure standard (ESRS E1 *Climate Change*) under the EU's Corporate Sustainability Reporting Directive requires disclosure of "*a qualitative assessment of the potential locked-in GHG emissions from the undertaking's key assets and products. This shall include an explanation of if and how these emissions may jeopardise the achievement of the undertaking's GHG emission reduction targets and drive transition risk, and if applicable, an explanation of the undertaking's plans to manage its GHG-intensive and energy-intensive assets and products*" (see ESRS E1-1 para. 16(d)). The International Sustainability Standards Board's industry-specific guidance for oil and gas sector climate reporting under IFRS S2 asks companies to "*perform a sensitivity analysis of its reserves to determine how several future scenarios may affect the determination of whether the reserves are proved or probable*" and "*analyse the sensitivity of its current proven and probable reserves using the price trajectories published by the International Energy Agency (IEA) in its World Energy Outlook (WEO) publication*". It also requires Companies to consider disclosure of an estimate of the carbon dioxide emissions embedded in its proved hydrocarbon reserves (see pp.90-92 of IFRS-S2 *Industry-based Guidance on implementing Climate-related Disclosures*).
[6] See, for example: effects-of-climate-related-matters-on-financial-statements.pdf (ifrs.org) and The Consideration of Climate-Related Risks in an Audit of Financial Statement | IAASB.

to be assessed as part and parcel of the environmental impact assessment process for oil and gas projects.[7] Taken together, these developments evidence clear emerging regulatory and legal demand for consistent assessment and reporting that takes into account the impact of climate-related risks and the energy transition on the viability of fossil fuel extraction, and the impact of fossil fuel emissions on the climate. A reserves estimation and classification methodology that takes science-based carbon budgets into account can be a valuable input into such reporting and help to prevent the introduction of avoidable financial risk (e.g. stranded assets) into markets. Climate-blind reserves estimations cannot.

Finally, continued development and dissemination of the United Nations Framework Classification for Resources (**UNFC**)[8] and Resource Management System (**UNRMS**)[9], is likely to influence national standards and expectations and industry practice over time. UNRMS, for example, explicitly requires the well-being of the earth, its inhabitants, and the environment to be taken into account.[10] PRMS must adapt to this overall direction of travel in order to remain relevant, reliable and credible in the broader context of climate change and the global policy response to it.

Against this background, we recommend that the OGRC considers the proposals for reform provided in this submission. These comprise:

1. A dedicated test of the 'atmospheric viability' of fossil fuel resources reserves, based on remaining carbon budgets and linked to the break-even price compatible with such budgets (alongside existing tests of their economic and technical recoverability); and
2. Supplementary adjustments to PRMS (and any accompanying guidance documents) to make it clear that the impact of low carbon transition must be fully integrated into resource and reserves estimation under PRMS.

We are grateful for your consideration of our proposal, and would welcome a dialogue on the evolution of PRMS so that it can appropriately take climate-related constraints on resources and reserves into account.

A. 'Atmospheric viability'

Reform

The resources classification system set out in PRMS should incorporate a test of 'atmospheric viability' into the assessment of whether resources are recoverable.

The test would assess whether:

(a) there is space in the atmosphere for the reserves in question, once combusted, taking into account the best and most credible scientific estimates of the remaining carbon budget that are available

[7] See R (on the application of Finch on behalf of the Weald Action Group) (Appellant) v Surrey County Council and others (Respondents) (supremecourt.uk). The majority judgment noted that "*issues relating to climate change and the extent to which disclosure of information about GHG emissions should be required are becoming more and more salient in policy-making and public debate*" (§60). For an example of commentary on the judgment, see: Finch vs Surrey County Council: In groundbreaking decision, Supreme Court rules the grant of planning permission for oil production was unlawful for failing to assess the 'downstream' greenhouse gas emissions | Cornerstone Barristers.
[8] United Nations Framework Classification for Resources Update 2019 (ECE ENERGY SERIES No. 61) | UNECE.
[9] United Nations Resource Management System (UNRMS) | UNECE.
[10] See p.7 of the UNRMS.

(and projected global demands on it) in reference scenarios, and a scientific assessment of the likely emissions released once the reserves are combusted; and

(b) the extraction of its reserves is otherwise consistent with credible science-based pathways to limiting global temperature rise to 1.5°C [11].

The reference scenarios considered in the assessment would be used to identify a per barrel break-even price (or equivalent measure) compatible with the carbon budget associated with the relevant scenario. If petroleum resources under assessment require a break-even price which exceeds the limit imposed by the relevant reference scenario, they would not be considered compatible with the scenario or the carbon budget implied by the scenario.[12][13] For new projects, however, the test should also adhere to the principle that new oil and gas projects are incompatible with, or at least not required in, scenarios compatible with holding warming to 1.5°C.[14] Where relevant, this principle should trump the break-even price assessment described in this paragraph.

Petroleum resources (whether discovered or undiscovered) which fail the test would be considered unrecoverable. They would not be treated as reserves and would not enter production.

Design of the 'atmospheric viability' test

In our view, reserves which do not fit within the remaining carbon budget for 1.5°C (once burned) (including in principle all new projects) should not be considered recoverable or commercial. However, we recognise that the design and implementation of this test requires a number of choices to be made by the SPE.

At the other end of the spectrum from an outright assessment of viability would be a requirement for the 'atmospheric viability' of reserves (including assessment of a viable break-even price) to be assessed against a range of authoritative science-based climate and energy sector scenarios.[15][16] Assessors would be required to justify their choice of scenarios.

Resources would then be classified against the temperature scenario in which their reserves become viable. For anything other than a 1.5°C scenario, this would amount to a warning label stating clearly that the reserves are only viable at a level of global warming that poses serious hazard to human health, society and the environment. We consider this a minimum approach to the reform of PRMS.

[11] Or any successor to the Paris Agreement goal that is subsequently agreed by a significant number of states.
[12] By way of illustration only, the IEA's *'World Energy Outlook 2023'* (October 2023) projected that "*In the NZE Scenario, oil and gas prices quickly fall to the costs of the marginal project required to meet falling demand, which is around USD 40/barrel for oil in 2030, before declining further to USD 25/barrel in 2050. These prices cover the operating expenses to lift oil and gas out of the field of the marginal producer, the capital expenditure and operating cost required in emissions reduction technologies, as well as upstream taxes*." (p.96). In considering a robust framework for assessing marginal breakeven prices of potential projects, relevant to the classification of reserves, then Carbon Tracker Initiative's least-cost analysis is one example. See: Paris Maligned II - Carbon Tracker Initiative for details. Under this methodology, the marginal breakeven prices for potential oil and gas projects calculated for global oil and gas supply and the IEA's World Energy Outlook 2023 are ~$40/bbl for the APS demand and ~$65 for the STEPS demand. There is no space for new projects in the modelled NZE scenario.
[13] We would expect this assessment and reporting to be achievable without raising significant confidentiality concerns. If they do arise, however, projects could be stress tested for viability through disclosure of project capex and costs falling within different break-even price bandings. It would follow that projects and associated capex and costs that are at within the lowest break-even price bandings are more likely to fall within the remaining carbon budget for a given climate scenario.
[14] See the IEA's projection that in the net zero scenario, "*investment in existing fields is needed to ensure that supply does not decline faster than demand, but no new conventional long lead time oil and gas projects are developed after 2023*". See p.135 of IEA, *'World Energy Outlook 2023'* (October 2023), available here.
[15] Reference scenarios would include the International Energy Agency's (**IEA**) Net Zero emissions by 2050 (**NZE**), Announced Pledges (**APS**) and Stated Policies (**STEPS**) scenarios.
[16] For the avoidance of doubt, any assessment must not rely unduly on unproven or speculative technologies or inappropriate netting or 'offsetting' of emissions (to the extent this restriction is not already built into the climate scenarios used for reference).

Rationale

PRMS omits climate constraints

Currently, resources are classified in PRMS as discovered or undiscovered and recoverable or unrecoverable. The recoverable resources are then classified as production, reserves, contingent resources or prospective resources according to their ability to be commercially extracted and sold.[17]

'Reserves' are defined as "*those quantities of petroleum anticipated to be commercially recoverable by application of development projects to known accumulations from a given date forward under defined conditions*". Reserves must satisfy four criteria: discovered, recoverable, commercial, and remaining based on the development project(s) applied, and are further categorised based on the certainty of their recovery.[18]

Determining the recoverability of reserves involves an assessment of the geological, technological and commercial circumstances surrounding the reserves. Determining the commerciality of the reserves is then key. In order for resources to be considered commercially mature, the entity claiming commerciality must show a firm intention to proceed with development, and various specific criteria must be met. These criteria include a reasonable assessment that the development projects will have positive economics, and a reasonable expectation that there will be a market for the resources.[19]

Reserves and resources are evaluated based on a number of 'defined conditions'. These include factors that affect commerciality such as "*decision hurdle rates; commodity prices; operating and capital costs; technical subsurface parameters; marketing, sales route(s); environmental, governmental, legal, and social factors; and timing issues*."[20]

Crucially, not one of these definitions, criteria, tests, conditions or factors explicitly requires the constraints on emissions associated with global efforts to limit global warming to be taken into account in the classification of resources and reserves. Moreover, there is no freestanding requirement to consider climate-related matters (including the transition to a low carbon economy) when determining whether resources and reserves are recoverable or commercial.[21]

PRMS does acknowledge the existence of "*modifying factors that may additionally influence investment decisions, such as contractual or political risks* [which] *should be recognized so the entity may address these factors if they are not included in the project analysis*".[22] In various places, PRMS also lists "environmental factors" among the factors which may influence the assessment of commerciality.[23]

In our view, the requirements to consider 'defined conditions' and 'modifying factors' are already broad enough to require an assessment of the impact of carbon budgets, stranded asset risk and national climate policies on the commerciality of a project. The same could be said of the basic requirement to form a reasonable expectation of positive economics and a market for resources, both of which could clearly be affected by energy transition.

[17] See para. 1.1.0.3 of PRMS 2018.
[18] See pp.3, 31 and 49 of PRMS 2018.
[19] See para. 2.1.2.1 of PRMS 2018.
[20] See paras. 1.2.0.10 and 3.0.0.2 and p.40 of PRMS.
[21] The word "climate" does not appear once in PRMS 2018.
[22] See para. 3.1.0.1 of PRMS 2018.
[23] See paras. 1.2.0.10, 3.0.0.2, 3.1.0.1 and p.40 of PRMS 2018.

However, these broad requirements fall short of an explicit obligation to consider climate-related matters in the assessment and there is a lack of necessary guidance as to the "environmental factors" that must be considered. Moreover, our understanding is that, in practice, these provisions of PRMS are not routinely interpreted to require the consideration of climate constraints on reserves. At minimum, the SPE should issue clear guidance to the effect that climate-related matters should be routinely considered as relevant "modifying factors" in the course of reserves assessment.[24] While this is a necessary first step, the 'atmospheric viability' test described in these submissions is essential to ensure the integrity and continued relevance of the PRMS methodology in today's climate context.

PRMS must incorporate climate constraints

The 2015 Paris Agreement established international consensus behind the goal of "*holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels"*.[25] In the Glasgow Climate Pact concluded at COP26 in Glasgow in 2021, the Conference of the Parties recognised that "*the impacts of climate change will be much lower at the temperature increase of 1.5°C compared with 2 °C*" and "*resolved to pursue efforts to limit the temperature increase to 1.5°C*", and this was reaffirmed by the Parties at COP27.[26]

The UN Intergovernmental Panel on Climate Change (**IPCC**) confirmed in 2022 that projected CO2 emissions from existing and planned fossil fuel infrastructure (without additional abatement) will exceed levels consistent with pathways that limit global warming to 1.5°C with no or limited overshoot.[27]

The implication is that many proven fossil fuel reserves must be left in the ground for the world and its governments to stand any chance of meeting internationally agreed climate goals. A recent academic study has suggested that in order to limit global warming to 1.5°C, up to 40% of fossil fuel reserves currently under development will need to be left in the ground.[28] Carbon Tracker's own research suggests that up to 90% of fossil fuel reserves must remain in the ground to limit warming to 1.5°C, and shows that there are already more fossil fuels listed on global financial markets than the world can afford to burn if it is to prevent dangerous climate change. According to Carbon Tracker, limiting warming to 2°C would require around 60% of discovered reserves to stay in the ground.[29]

In other words, the emissions associated with the exploitation of proven fossil fuel reserves would vastly exceed the remaining carbon budget to limit global warming to 1.5°C. In 2022, the IPCC estimated that the remaining carbon budget from 2020 onwards for a 50% probability of limiting warming to 1.5°C was 500 $GtCO_2$.[30] The IPCC also estimated that if historical operating patterns are maintained, cumulative future CO_2 emissions from existing and planned fossil fuel infrastructure would, from 2018 until end of life, amount to 850 $GtCO_2$.[31] Carbon Tracker have calculated the total embedded emissions of known fossil fuel reserves to be as high as 3,700 $GtCO_2$ (the embedded emissions of discovered reserves and

[24] This approach would be consistent with guidance issued by accounting and audit standard setters in relation to the interpretation of existing standards to require climate-related matters to be taken into account. See, for example: effects-of-climate-related-matters-on-financial-statements.pdf (ifrs.org).
[25] Article 2(1)(a), ADOPTION OF THE PARIS AGREEMENT - Paris Agreement text English (unfccc.int).
[26] See para. 21 of Decision 1/CMA.3 (unfccc.int) and para. 7 of Decision 1/CP.27 on the Sharm el-Sheikh Implementation Plan (Decisions taken at the Sharm El-Sheikh Climate Change Conference | UNFCCC).
[27] See IPCC AR6 WGIII SPM at B.7.
[28] See '*Existing fossil fuel extraction would warm the world beyond 1.5 °C*' (Trout et al., 17 May 2022, Environ. Res. Lett. 17).
[29] See '*Unburnable Carbon: Ten Years On*' (2022).
[30] See IPCC AR6 WGIII SPM at B.1.3.
[31] IPCC AR6 WGIII SPM at B.7.1.

resources held by companies with a public listing were calculated to be 1,050 $GtCO_2$).[32] Others have estimated that between 2013-2022, average global GHG emissions were equivalent to 53 $GtCO_2$ per year. The estimated remaining carbon budget at the start of 2024 of 200 $GtCO_2$ (for a 50% chance of limiting warming to 1.5°C) would be exhausted within less than five years at those rates.[33] As should be clear from the above, if we are to stay within the remaining carbon budget, a significant proportion of fossil fuel reserves will need to remain in the ground.

This situation is reflected in the work of the International Energy Agency (**IEA**). Since 2021, the IEA has recognised that, in its net zero scenario projections, "*no new oil and natural gas fields are required beyond those that have already been approved for development*"[34]. In 2023, the IEA concluded that, in the net zero scenario, "*investment in existing fields is needed to ensure that supply does not decline faster than demand, but no new conventional long lead time oil and gas projects are developed after 2023 and investment is much lower than today*."[35] This is also increasingly reflected in the international policy response to climate change. In its 2021 Inevitable Policy Response model, the UN PRI concluded that a "*significant acceleration in climate policy by 2025 is likely*".[36] In its 2023 World Energy Outlook, the IEA found for the first time that even under its stated policies scenario, which reflects current policy settings by governments worldwide, demand for coal, oil and gas is projected to peak by 2030.[37]

The implications for the recoverability and commerciality of resources and reserves are plain to see: even on a current policy trajectory, demand for oil and gas will decline; and vast quantities of oil and gas resources and reserves cannot be burned if global warming is to be limited to 1.5°C. This has led the IFRS Foundation, in its climate reporting guidance for the oil and gas sector, to observe that: "*Exploration and production (E&P) entities may be unable to extract a significant proportion of their proved and probable oil and gas reserves if greenhouse gas (GHG) emissions are controlled to limit global temperature increases. Entities with more carbon-intensive reserves and production and higher capital costs may face greater risks. Regulatory limits on GHG emissions, together with improved competitiveness of alternative energy technologies, could reduce global demand growth, and therefore reduce prices for oil and gas products. Extraction costs could increase with regulations that put a price on GHG emissions. These factors could affect the economic viability of oil and gas reserves.*"[38]

In this context, the appropriate response is to build a test of 'atmospheric' viability, based on the remaining carbon budget, into the PRMS framework. Doing so can help companies avoid the accumulation of fossil fuel assets at acute risk of becoming 'stranded'[39]. It is also key to accurate pricing and efficient allocation of capital (including towards the energy transition). Failing to do so makes PRMS unfit for purpose in that it will underpin the widespread and contentious assessment of reserves as viable with no regard for the energy transition or remaining carbon budgets. The financial and legal implications of this for fossil fuel companies and their investors (i.e. those that directly or indirectly rely on the outputs from PRMS assessments) are huge, as are the ramifications for the credibility of, and continued regulatory reliance upon, PRMS.

[32] See '*Unburnable Carbon: Ten Years On*' (2022).
[33] Guest post: Tracking the unprecedented impact of humans on the climate - Carbon Brief and ESSD - Indicators of Global Climate Change 2023: annual update of key indicators of the state of the climate system and human influence (copernicus.org).
[34] See IEA, '*World Energy Outlook 2021'* (October 2021), available here, at p.100.
[35] See p.135 of IEA, *'World Energy Outlook 2023'* (October 2023), available here.
[36] The Inevitable Policy Response 2021: Forecast Policy Scenario and 1.5C Required Policy Scenario | Thought leadership | PRI (unpri.org).
[37] See p.26 of IEA, *'World Energy Outlook 2023'* (October 2023), available here.
[38] See p.90 of IFRS-S2 *Industry-based Guidance on implementing Climate-related Disclosures*.
[39] In the sense that they cannot be economically utilised.

B. Other reforms and competence issues

Taking account of the transition to a low carbon economy in PRMS reserves estimations requires a suite of other consequential amendments to PRMS which are complementary to the 'atmospheric viability' test. Through explicit requirements or amendments to existing passages of PRMS (and / or related guidance), these changes should make it clear that climate-related risks, assumptions and dependencies are relevant to reserves estimation and must be considered in the assessment.

Areas where reform would be suitable include the following, but this is a non-exhaustive list.

- "Defined conditions", and any other conditions relevant to the commercial viability of a development project should explicitly include physical climate risk and the impact of transition (including the international policy response to climate change) on anticipated costs, commodity price and demand assumptions, legal and regulatory compliance, taxes and other conditions.
- The criteria for commerciality[40] should include: (a) an assessment (which must be specifically and clearly disclosed) of how climate-related risk and the energy transition have influenced the assessment of the existing criteria A-G; and (b) evidence that the development projects are consistent with reference climate scenarios (including by reference to a viable break-even price).
- High estimate, best estimate and low estimate production forecasts should take climate constraints and the impact of transition into account, including as to the uncertainty associated with recovery.
- Reserves should be additionally classified against the temperature scenarios with which they are consistent (1.5°C, 2°C, 3°C, 4°C etc.).
- Net estimated cash-flow evaluations should take the impact of climate risk and the energy transition on any cost, commodity price, tax and demand assumptions into account, and clearly state the basis of the evaluation. Any alternative economic scenarios used[41] must include those aligned with credible climate transition pathways.
- Definitions should be updated to reflect the 'atmospheric viability' test and the amendments set out above.
- To the extent not otherwise required, the embedded emissions associated with the resources under assessment should be assessed, disclosed and tested against the remaining carbon budget.

In all cases, the scenarios used for assessment should be authoritative and science-based, and should include a scenario consistent with 1.5°C of warming. The choice of reference scenarios should be justified in any reporting on the classification.

Finally, we note that many of the suggestions included in these submissions may require fundamental changes to the qualifications and competence requirements for the professionals charged with PRMS estimations or collaboration with climate experts. The SPE's view on its unreadiness to grapple with the implications of climate science is noted in the summary section. It is essential that, as PRMS is updated, professionals develop their climate expertise sufficiently. To the extent this is not possible, climate experts must be welcomed into the industry to provide it. Changes to the mandate and governance of the SPE to take climate change into account may also help ensure PRMS can evolve as required.

[40] See para. 2.1.2.1 of PRMS 2018.
[41] See para. 3.1.2.6 of PRMS 2018.

Contact details

These submissions have been prepared by ClientEarth and Carbon Tracker Initiative. If you would like to discuss anything contained in the submissions, please contact:

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