



To: Oil and Gas Reserves Committee, Society of Petroleum Engineers  
From: Public Citizen  
Re: Proposed Update to the Petroleum Resources Management System (PRMS)

### **The PRMS Requires a Climate Test**

Thank you for this opportunity to comment on the proposed 2024 update to the Petroleum Resources Management System (PRMS).<sup>1</sup> Incorporating climate science and carbon budget considerations into the PRMS is critical to accurately inform future oil and gas development and safeguard the industry, investors, and society at large. Civil society and climate scientists have been notably absent from PRMS deliberations, a significant deficiency given our potential contribution to the process and the fact that climate change impacts caused by the burning of fossil fuels are devastating communities across the globe.

We urge the Oil and Gas Reserves Committee to work with relevant experts to incorporate a climate test into PRMS consistent with the temperature and emissions targets of the 2015 Paris Agreement.<sup>2</sup> A climate-related test is essential to protect companies and their investors from financial risks resulting from stranded assets, unprofitable and risky projects, as well as a general misallocation of resources during a time of rapid energy transition and escalating climate impacts. Further, the Committee must embed climate-related considerations in PRMS to ensure it remains relevant to today's business context, as well as consistent with national climate policies, regulations and international law.

---

<sup>1</sup> The PRMS sets a global standard for defining, classifying, and estimating oil and gas reserves. The goal of the system is to ensure consistent and reliable reserve calculations across a diverse range of projects and companies. PRMS is periodically updated and revised in light of advances in geologic sciences, extractive technologies, and industry requirements. The System was last updated in 2018. Source: Petroleum Resources Management System, revised June 2018 (v. 1.03):

[https://info.specommunications.org/rs/833-LLT-087/images/PRMgmtSystem\\_V1.03.pdf](https://info.specommunications.org/rs/833-LLT-087/images/PRMgmtSystem_V1.03.pdf)

<sup>2</sup> PRMS is managed by the Oil and Gas Reserves Committee of the Society of Petroleum Engineers, which is itself composed of international oil and gas experts in partnership with a number of fossil fuel industry-related societies. Climate-related expertise is lacking, as confirmed by the SPE's own Climate Change Task Force: "SPE does not have technical expertise or mandate for assessing climate science or guiding policy." PE Climate Change Task Force Recommendation:

<https://www.spe.org/en/disciplines/hse/climate-change-task-force-recommendation/>

## Background

PRMS standards play a fundamental role in determining which oil and gas projects make it to market. In the United States, PRMS standards are the basis for the Competent Person’s report,<sup>3</sup> which must be submitted to the Securities and Exchange Commission as part of any new or amended oil and gas company prospectus before reserves can be recognized and form part of an offering to investors. In the absence of a determination of viability in the Competent Person’s report, that project is precluded from being advertised in a company prospectus or otherwise used as a basis for raising capital.

The primary function of the PRMS standards is to help parties consistently and accurately assess the viability of oil and gas deposits for extraction and development, so that fossil ‘resources’ may be deemed proven ‘reserves’ that may be developed and whose estimated production (i.e., future cash flows) can be added to the balance sheet.<sup>4</sup> Figure 1.1, from the 2018 PRMS update, graphically represents the resources classification system in use.

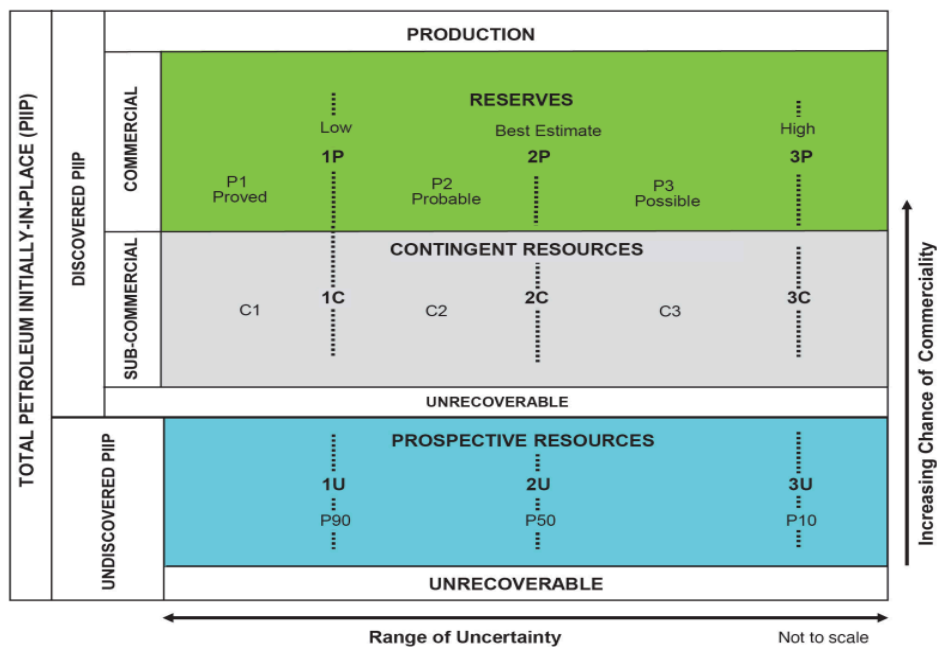


Figure 1.1—Resources classification framework

<sup>3</sup> Competent Person’s Reports are regulatory filings that provide an expert accounting of petroleum assets of exploration and production and help to inform investment decisions. They are required in many jurisdictions as part of initial public offerings (IPOs), mergers and acquisitions, reserve-based lending, equity raising, and a range of regulatory filings. See, e.g., <https://www.demac.com/services/competent-persons-reports/>

<sup>4</sup> SEC Modernization of Oil and Gas Reporting, 17 CFR Parts 210, 211, 229, and 249, Eff. January 1, 2010: <https://www.sec.gov/files/rules/final/2008/33-8995.pdf>

Under the PRMS, the technical feasibility of pulling hydrocarbons from the earth at lowest cost is the primary determinant of whether petroleum makes it to market and moves up the ladder of “commerciality” depicted above. Specifically, there are two main considerations for commercial viability of the petroleum deposit in question:

1. Is the petroleum technically recoverable from the geological deposit with current drilling and extraction technologies?
2. Is the petroleum economically recoverable in light of current market costs and prices?

The PRMS elaborates:

Not all technically feasible development projects will be commercial. The commercial viability of a development project within a field’s development plan is dependent on a forecast of the conditions that will exist during the time period encompassed by the project. Conditions include technical, economic (e.g., hurdle rates, commodity prices), operating and capital costs, marketing, sales route(s), and legal, environmental, social, and governmental factors forecast to exist and impact the project during the time period being evaluated.<sup>5</sup>

As such, technical and economic viability are the primary considerations for determining reserve viability for commercial development. They are the baseline against which fossil reserves are tested across the industry.

Notably absent in the current model is equal consideration of whether the oil or gas is recoverable in light of climate change, emerging regulatory constraints, and the remaining global carbon budget.<sup>6</sup> The PRMS also fails to consider the impact on asset valuations of the catastrophic economic effects that would result from unrestrained burning of fossil fuels on current global trajectories.

To avoid any doubt of industry requirements and environmental considerations, we strongly urge that the viability of reserves also be explicitly considered based on the limits set within the carbon budget linked with the Paris Agreement, to which the United States is a signatory. A stress test against industry recognized and accepted climate scenarios that include demand ranges and price scenarios, such as the IEA net zero scenarios, is further recommended. We propose an outline of such a climate test for oil and gas reserve viability below.

---

<sup>5</sup> Petroleum Resources Management System, revised June 2018 (v. 1.03) at Sec. 1.2.0.10: [https://info.specommunications.org/rs/833-LLT-087/images/PRMgmtSystem\\_V1.03.pdf](https://info.specommunications.org/rs/833-LLT-087/images/PRMgmtSystem_V1.03.pdf)

<sup>6</sup> It bears noting that “legal, environmental, social, and governmental factors” are among the conditions that ought to impact a determination of project scope and viability but these tend to encompass local conditions on the ground – a lawsuit challenging the development, for example, or a particularly sensitive or vulnerable habitat or ecosystem. There is nothing listed which would encompass the sweeping climatic considerations required at this time.

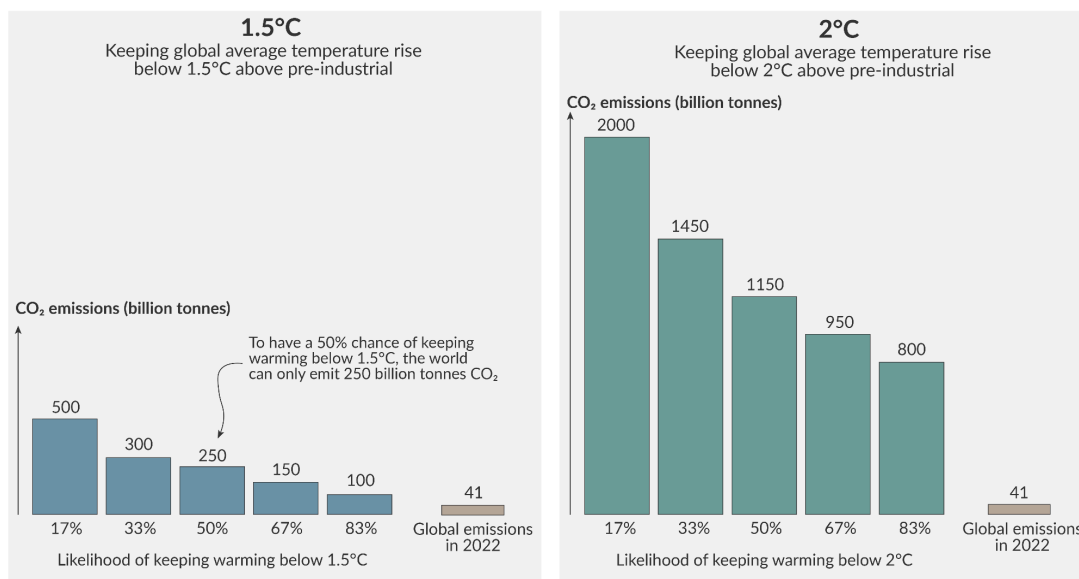
## Fossil reserves far exceed humanity's remaining carbon budget.

The PRMS reserve standards require urgent updating in light of the nearly depleted global carbon budget for keeping climate change within the temperature targets set by the 2015 Paris Agreement. The 196 country signatories to that binding international agreement committed to “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.”<sup>7</sup> The remaining carbon budget for a 50% chance of limiting warming to 1.5°C is only 250 GtCO<sub>2</sub>.<sup>8</sup> The world currently emits more than 40 GtCO<sub>2</sub> annually; thus, humanity’s entire carbon budget for 1.5°C could be spent by 2030.<sup>9</sup>

In 2022, the UN Intergovernmental Panel on Climate Change (IPCC) concluded that projected CO<sub>2</sub> 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.<sup>10</sup>

### Carbon budget to keep global warming below 1.5°C and 2°C

How much total CO<sub>2</sub> can be emitted to keep global average temperature rise below 1.5°C and 2°C, compared to pre-industrial temperatures. This is remaining budget from the start of 2023. Current annual emissions from fossil fuels, industry and land use are shown for context.



Data source: Budgets from Forster et al. (2023). Current emissions data from the Global Carbon Project. OurWorldinData.org – Research and data to make progress against the world’s largest problems.

Licensed under CC-BY by the author Hannah Ritchie.

<sup>7</sup> The Paris Agreement, Article 2(1)(a): [https://unfccc.int/sites/default/files/english\\_paris\\_agreement.pdf](https://unfccc.int/sites/default/files/english_paris_agreement.pdf)

<sup>8</sup> <https://essd.copernicus.org/articles/15/2295/2023/essd-15-2295-2023.html> In 2022, the UN Intergovernmental Panel on Climate Change (IPCC) concluded that the remaining carbon budget for a 50% probability of limiting warming to 1.5°C was 500 GtCO<sub>2</sub>. The budget is updated annually

<sup>9</sup> Lamboll, Nicholls, et al., Assessing the size and uncertainty of remaining carbon budgets, Nature Climate Change, October 30, 2023: <https://www.nature.com/articles/s41558-023-01848-5>

<sup>10</sup> IPCC, Climate Change 2022, Mitigation of Climate Change, section B.1.3 at p.6: [https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC\\_AR6\\_WGIII\\_SummaryForPolicymakers.pdf](https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC_AR6_WGIII_SummaryForPolicymakers.pdf)

It follows that the amount of potential carbon emissions stored in the world's oil and gas deposits dwarfs the remaining carbon budget by orders of magnitude, and many proven reserves must be left in the ground. This is the case not just on environmental grounds, but because the production and use of a significant fraction of reserves would deeply destabilize economies, rendering the valuations of fossil fuel reserves inaccurate at best. Recent research has found that the economic impacts of just 1 degree Celsius of warming would lead to a 12% decline in world GDP, an outcome six times worse than previously expected.<sup>11</sup> The world has long since crossed this threshold, having recently breached the "critical" 1.5°C temperature target for 12 months in a row.<sup>12</sup>

The nonprofit organization Carbon Tracker suggests that up to 90% of fossil fuel reserves must remain in the ground to limit warming to 1.5°C, and that there are already more fossil fuels listed on global financial markets than the world can afford to burn. According to Carbon Tracker, limiting warming to 2°C would require around 60% of discovered reserves to stay in the ground.<sup>13</sup> Another recent academic study concludes that 40% of fossil fuel reserves *currently under development*, what the authors call "committed emissions," will need to be left in the ground in order to limit global warming to 1.5°C.<sup>14</sup>

### The PRMS Climate Test

The PRMS system must include a basis for testing future planned production against the remaining carbon budget. The geologic and commercial viability of the reserve in question is a threshold determination, but whether the reserve is developed should hinge on the climate test. The SPE will need to engage experts to design the details of the reserve climate-compatibility test with operational specificity, but we recommend this general approach:

- 1) *Specify the carbon budgets against which fossil reserves will be tested.* For example, PRMS could specify the carbon budget associated with a given probability of keeping temperature rise to 1.5 and 2 degrees,<sup>15</sup> or it might consider the carbon budgets associated with the IEA's climate scenarios.<sup>16</sup>

---

<sup>11</sup> Millman, Economic damage from climate change six times worse than thought – report, The Guardian, May 17, 2024: <https://www.theguardian.com/environment/article/2024/may/17/economic-damage-climate-change-report>

<sup>12</sup> Critical 1.5C Global Warming Threshold Breached Over 12-Month Period for First Time, Earth.org, February 9, 2024: <https://earth.org/critical-1-5c-global-warming-threshold-breached-over-12-month-period-for-first-time/>

<sup>13</sup> Allen and Coffin, Unburnable Carbon: Ten Years On, Carbon Tracker, June 23, 2022: <https://carbontracker.org/reports/unburnable-carbon-ten-years-on/>

<sup>14</sup> Trout, Muttitt, et al., 'Existing fossil fuel extraction would warm the world beyond 1.5 °C', Environ. Res. Lett. 17, May 17 2022: <https://iopscience.iop.org/article/10.1088/1748-9326/ac6228>.

<sup>15</sup> See, e.g., Ritchie, How much CO2 can the world emit while keeping warming below 1.5°C and 2°C?, Our World in Data, September 29, 2023:

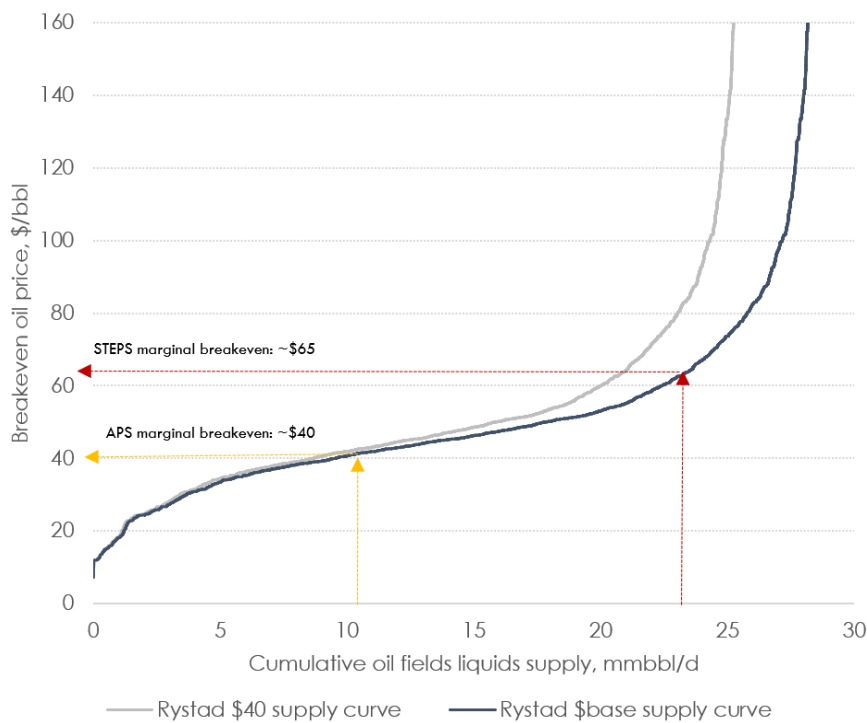
<https://ourworldindata.org/how-much-co2-can-the-world-emit-while-keeping-warming-below-15c-and-2c>

<sup>16</sup> The IEA's World Energy Outlook, Energy Technology Perspectives, and related reports, explore three scenarios: "The Net Zero Emissions by 2050 Scenario (NZE Scenario) is normative, in that it is designed to achieve specific outcomes – an emissions trajectory consistent with keeping the temperature rise in 2100 below 1.5 °C (with at least a 50% probability)

- 2) Identify the per barrel breakeven oil prices compatible with the carbon budgets. The graph below provides a sample analysis of breakeven prices for the demand scenarios issued by the IEA.<sup>17</sup>
- 3) Stress test the reserves against the carbon budgets.

The relevant inquiry here is what proportion of the company's reserves require breakeven prices in excess of the demand scenario associated with a given temperature target and its carbon budget. Any reserves with breakeven prices exceeding that threshold would not be compatible with the carbon budget, fail the climate test, and could not be recommended for development in the Competent Person's report.<sup>18</sup>

### Cumulative Potential Oil Supply from Unsanctioned Oil Fields (2024-2040)



Source: IEA, Rystad Energy, Carbon Tracker analysis. Notes: Breakeven prices assume a 15% IRR.

with limited overshoot, universal access to modern energy services by 2030 and major improvements in air quality – and shows a pathway to reach them. The Announced Pledges Scenario (APS) and the Stated Policies Scenario (STEPS) are exploratory, in that they define a set of starting conditions, such as policies and targets, and see where they lead based on model representations of energy systems that reflect market dynamics and technological progress.”

<https://www.iea.org/reports/global-energy-and-climate-model/understanding-gec-model-scenarios>

<sup>17</sup> O'Connor, Paris Maligned II: Climate alignment assessments reveal oil and gas company transition risk exposure, Carbon Tracker, March 10, 2024: <https://carbontracker.org/reports/paris-maligned-2/>

<sup>18</sup> Carbon Tracker suggests a practical way for this to be reported is by using price bands around the barrel price: What proportion of a company's planned reserves production are within \$5-10/ bbl; \$10-20/ bbl, etc.? This would reveal to investors whether the company is, as a whole, a 'low cost producer' or has a high proportion of 'high cost' projects that would make the company more vulnerable during the transition to a low-carbon future.

## **The SPE must update PRMS to remain relevant and consistent with its mission.**

The PRMS explicitly notes that “legal, environmental, social, and governmental factors” are among the baseline conditions that must be factored into any analysis of reserve viability. While “legal” and “environmental” factors could be construed to include climate-related risk factors, there is nothing listed which would encompass the kind of rigorous climate-compatibility testing of fossil fuel reserves needed now. The SPE’s Climate Change Task Force admits that “that SPE does not have technical expertise or mandate for assessing climate science or guiding policy” and, therefore, “the Task Force does not recommend that SPE develop a public position statement on climate science and climate change.”<sup>19</sup>

However, the Climate Change Task Force also recognizes the need to stay relevant in the face of coming climate impacts: “The Task Force . . . proposes that SPE adopt a climate change strategy to maximize alignment with the existing mission and vision of SPE, while positioning SPE to expand its mission and vision *should the landscape change further during the 21st Century.*”<sup>20</sup> It is undeniable that climate change and the energy transition are categorically re-shaping the landscape of this century and beyond. As a result, the SPE must engage climate scientists and experts in crafting standards that reflect current and coming market realities, not least of which could be a rapid repricing of fossil fuel assets, as some economists predict.<sup>21</sup>

It is a question of governance and potential misallocation of resources, as well as a substantial risk to market stability, to ignore the reality of exceeding the carbon budget. A modern and responsive PRMS must grapple with 21st century realities and introduce a climate test to inform viability of oil and gas reserves. As it stands, the recommendations of the SPE Climate Change Task Force are primarily focused on incremental reductions in emissions, including but not limited to: reducing carbon-intensity in hydrocarbon operations, supporting Carbon Capture, Utilization and Storage (CCUS) technologies, and tracking public opinion on climate that “could impact SPE’s ability to deliver its mission.”<sup>22</sup> None of the activities in the scope of the Task Force’s climate strategy grapple with the need to keep the majority of hydrocarbons in the ground. The PRMS urgently needs to build climate-related expertise to ensure that its standards are relevant, current, responsible, and grounded in rigorous science.

## **Conclusion**

---

<sup>19</sup> SPE Climate Change Task Force Recommendation: <https://www.spe.org/en/disciplines/hse/climate-change-task-force-recommendation/>

<sup>20</sup> Ibid, emphasis added.

<sup>21</sup> See, e.g., Semieniuk et al., “Stranded fossil-fuel assets translate to major losses for investors in advanced economies,” Nature Climate Change, May 26, 2022: <https://www.nature.com/articles/s41558-022-01356-y>

<sup>22</sup> SPE Climate Change Task Force Recommendation: <https://www.spe.org/en/disciplines/hse/climate-change-task-force-recommendation/>

Limiting reserve viability to economic and engineering considerations leaves a critical deficiency in the PRMS decision model and is not appropriate when climate change is an existential threat whose physical impacts—extreme weather events, deadly heat waves, catastrophic flooding, and fires that burn hotter, longer, and faster—are intensifying at an alarming rate. Moreover, the economic impacts of climate change are already exceeding worst-case scenarios by up to six-fold.<sup>23</sup> Burning a significant fraction of reserves would deeply destabilize economies, with significant implications for the PRMS and the industry writ large.

Expert bodies such as the International Energy Agency (IEA) have made it clear that meeting global climate targets require an end to exploration and expansion for new reserves. The IEA specifically noted in 2021 that *no* new fossil fuel extraction projects are compatible with the 1.5 degree target.<sup>24</sup> It is essential, therefore, to bring this understanding to bear in the reserve valuations of oil and gas fields so that their viability is informed by climate science as well as economics.<sup>25</sup>

To keep pace with science and international law,<sup>26</sup> the Oil and Gas Committee must add a third limb to its reserve viability standards. A climate test is past due. The current mismatch between global climate policy aims and the oil and gas industry standards has to be bridged, not only to preserve a livable climate but also to protect companies and investors from the inevitable repricing of fossil fuel assets and other second-order consequences of climate change.

Ultimately, a reserve should not be counted among an oil company's assets if its embedded emissions exceed the remaining carbon budget as set out by the goals of the Paris Climate Agreement. Companies are misleading investors if they are adding unburnable carbon, or carbon which would destabilize the economy *if* burned, to their balance sheets.

## About Public Citizen

---

<sup>23</sup> See, e.g., Millman, Economic damage from climate change six times worse than thought – report, The Guardian, May 17, 2024: <https://www.theguardian.com/environment/article/2024/may/17/economic-damage-climate-change-report>

<sup>24</sup> IEA, Net Zero Roadmap: A Global Pathway to Keep the 1.5 °C Goal in Reach (2023 Update), September 2023: <https://www.iea.org/reports/net-zero-roadmap-a-global-pathway-to-keep-the-15-0c-goal-in-reach>. In 2021, the IEA found that no new oil and gas extraction projects are consistent with a transition to net zero emissions by 2050. This report was updated in 2023, adding the caveat that “no new long-lead-time” oil and gas projects are consistent with net zero. This modification does not affect the majority of oil and gas reserves within the PRMS scope.

<sup>25</sup> Regulators must also revisit the practice of using current oil and gas prices as a benchmark for determining economic viability of a reserve. This assumption is flawed in a time of climate change and energy transition..

<sup>26</sup> The Paris Agreement is a legally binding international treaty on climate change. It was adopted by 196 Parties at the UN Climate Change Conference (COP21) in Paris, France, on December 12, 2015 and entered into force on 4 November 2016. <https://unfccc.int/process-and-meetings/the-paris-agreement>



Public Citizen is an American non-profit, non-partisan consumer rights advocacy group and think tank based in Washington, DC. It was founded in 1971 by the American lawyer Ralph Nader.