

# Financing a 1.5 ° C-Aligned Transition

## Insights from energy scenarios for financial institutions

Natalie Jones, Olivier Bois von Kursk, and Louise Rouse<sup>1</sup>

July 2023

### KEY MESSAGES

- According to a large consensus across multiple modelled climate and energy pathways, developing any new oil and gas fields is incompatible with limiting warming to 1.5°C. The International Energy Agency (IEA) Net Zero Emissions (NZE) scenario is not an outlier, but rather the consensus view.
- Using less ambitious scenarios may increase both transition risk and physical risk.
- Energy security and the gas shortage facing Europe are not served by opening new oil and gas fields. The short-term supply crunch expected in 2023 cannot be alleviated in time by newly added gas capacity. In 2023, demand-reduction measures combined with scaling up wind and solar would provide longer-term energy security while reducing stranded-asset risk.
- Investors should urge governments to stop issuing new oil and gas licences and to create enabling environments for redirecting both public and private capital flows toward the clean energy transition, including the deployment of additional solar and wind capacity.
- Investors' expectations of oil companies should include an end to capital expenditure on new oil and gas fields as well as 1.5°C-aligned declines in production levels.

---

<sup>1</sup> The authors thank Paul Schreiber (Reclaim Finance), Angela Picciariello (IISD) and Ivetta Gerasimchuk (IISD) for useful comments.

This brief draws from another IISD publication, *Navigating Energy Transitions: Mapping the Road to 1.5°C*, which is available [here](#).



## 1. Introduction

Energy and climate models provide insights about possible ways the future may unfold, based on various technical, economic, societal, and policy assumptions. Global energy production and consumption in a 1.5°C-aligned world need to be remarkably different from what they look like today; energy and climate models are the best available tools to assess the implications of such a transformation. The IEA World Energy Outlook provides one such model, the NZE scenario, offering an understanding of what the energy transition looks like if the world is to meet the Paris Agreement goals.

One of the major conclusions from the NZE scenario is that there is no room for the development of any new oil and gas fields under a 1.5°C-aligned energy transition scenario. Every new project beyond the fields that are already in operation or under development today is incompatible with the NZE scenario. Hence, all licensed reserves being explored or appraised today but which have not received a final investment decision by the end of 2022 would be in excess of 1.5°C-aligned oil and gas production. Nevertheless, the IEA NZE assumes continuing capital and operational expenditure<sup>2</sup> in existing oil and gas fields as well as in projects already in development that have been approved by companies and governments as of the end of 2021 but where production has not yet started.

Many financial institutions and investor groups have started using the IEA NZE scenario in the development of Paris-aligned investment strategies. However, others still ignore the conclusions of the IEA NZE scenario, arguing that there are many other pathways to 1.5°C—including those from the Intergovernmental Panel on Climate Change (IPCC)—and that there may still be room for continued financing of new oil and gas projects. By analyzing multiple modelled 1.5°C energy and climate pathways, including ones published by the IPCC, we demonstrate that, far from being an outlier, the IEA NZE conclusion that investments in new oil and gas fields would generate excessive supply in a Paris-aligned energy transition is the consensus view.

This briefing aims to help financial institutions counter industry pushback against the finding that 1.5°C-aligned scenarios mean no new oil and gas fields, and to understand the implications of this finding for oil company business models. This briefing will further show that despite Russia's invasion of Ukraine, opening up new oil and gas fields will not help Europe alleviate its energy security concerns. Rather, demand-reduction measures combined with scaling up wind and solar can provide longer-term energy security while reducing stranded-asset risk. This briefing also highlights the significant investment gap for solar and wind, which risks holding back the energy transition. Finally, it offers steps financial institutions can take to manage the resulting climate risks.

---

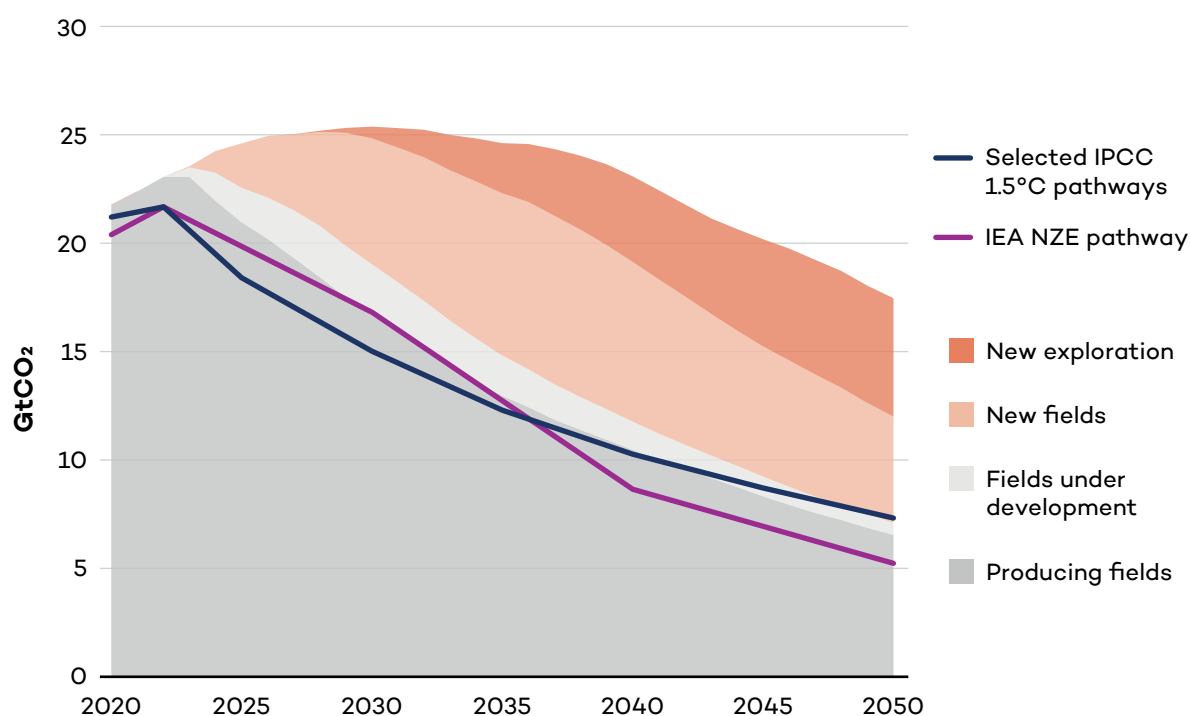
<sup>2</sup> This includes drilling of additional wells or maintenance and improvement of equipment in fields that are already in operation.



## 2. NZE Is Not an Outlier Scenario

According to a large consensus across multiple modelled climate and energy pathways, developing any new oil and gas fields is incompatible with limiting warming to 1.5°C. Figure 1 shows the volumes of all licensed oil and gas reserves globally, expressed in terms of their embodied carbon emissions. Superimposed on this are two pathways which are consistent with a rise of 1.5°C. The first is the median of selected 1.5°C IPCC pathways,<sup>3</sup> consisting of the pathways in the IPCC's (2022) Sixth Assessment Report that align with the 1.5°C limit, excluding those whose usage of bioenergy with carbon capture and storage (CCS) or fossil CCS is categorized by the IPCC as raising medium to high feasibility concerns.<sup>4</sup> Using less ambitious scenarios may increase both transition risk and physical risk<sup>5</sup> by underestimating the climate impacts and/or the short- to medium-term policy changes needed to effectively align with the 1.5°C goal.

**Figure 1.** Global oil and gas production, based on selected IPCC and IEA 1.5°C pathways



Sources: Byers et al., 2022; IEA, 2021; Rystad Energy, 2022.

<sup>3</sup> This represents the median estimate for oil and gas production from the 26 of the 97 IPCC 1.5°C scenarios that met the feasibility and sustainable threshold for the deployment of carbon dioxide (CO<sub>2</sub>) removals and carbon capture and storage (CCS) methods.

<sup>4</sup> Carbon sequestration achieved through bioenergy with CCS or fossil CCS was limited to 3.6 GtCO<sub>2</sub>/year and 3 GtCO<sub>2</sub>/year by 2050 respectively. The selected pathways also exclude scenarios with forest CO<sub>2</sub> removals that exceed the IPCC's estimate of maximum sustainable potential, which is limited to 3.8 GtCO<sub>2</sub>/year by 2050. Using less ambitious scenarios may increase both transition risk and physical risk.

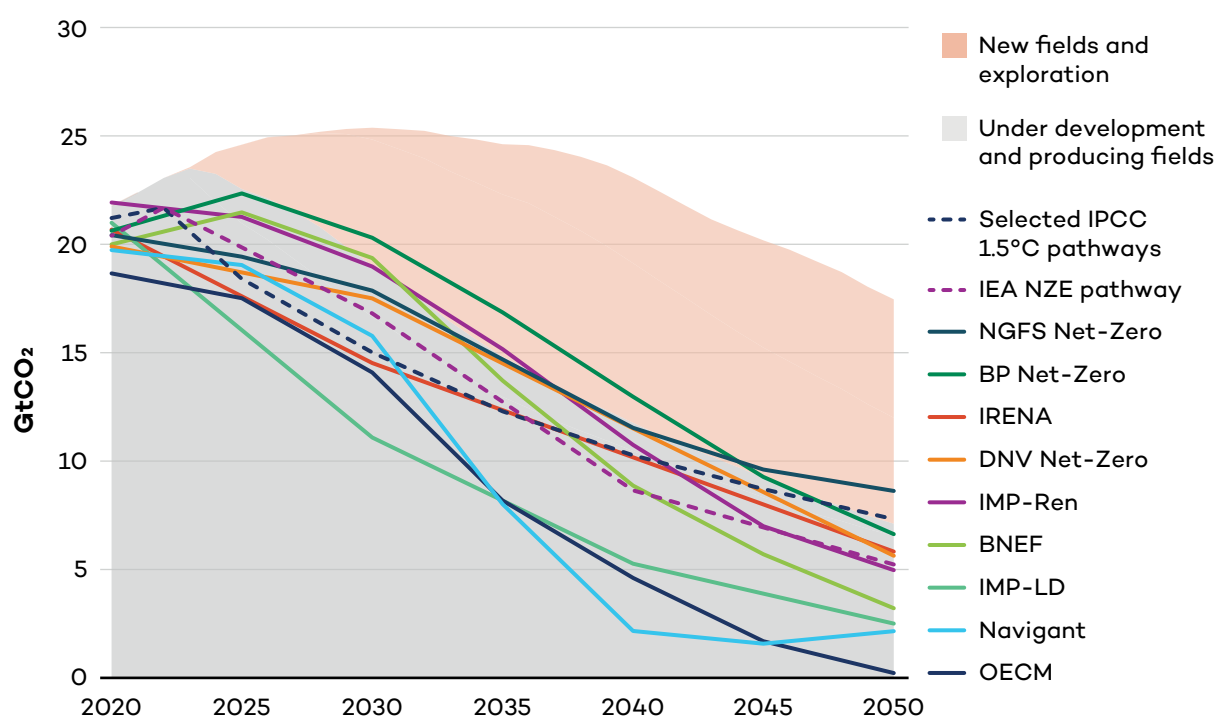
<sup>5</sup> Physical risks are risks resulting from climate change, such as extreme weather events like wildfires, floods, and storms. Transition risks are risks associated with policy action taken to transition to a lower-carbon economy (Bank of England, 2019).



The median of the selected 1.5°C IPCC pathways is compared to the IEA’s NZE scenario. These two pathways both show that oil and gas production should decline by at least 65% by 2050 from 2020 levels and that the 1.5°C-aligned level of consumption can be met with oil and gas fields already in production or under development (Bois von Kursk et al., 2022).

In the shorter term, the IEA and selected IPCC pathways showcase an 18% and 30% reduction in oil and gas production by 2030, respectively. This is equivalent to an average annual oil and gas production decline of 2% and 3% for the rest of this decade, respectively; in the 2030s, the average production decline accelerates to 6% and 4%, respectively (Byers et al., 2022; IEA, 2022). This implies that, unless currently producing fields’ operations are significantly curtailed, no new oil and gas fields should be developed, as they would either generate stranded assets or push the world beyond the 1.5°C target.

**Figure 2.** Global oil and gas production, based on other selected 1.5°C pathways



Sources: BNEF, 2021; BP, 2022, Byers et al., 2022; DNV, 2021; IRENA, 2022; Navigant, 2018; Rystad Energy, 2022; Teske et al., 2022.

Figure 2 shows eight additional Paris-aligned oil and gas pathways. Analysis of these additional scenarios shows that the conclusions derived from the median of selected IPCC 1.5°C pathways and the IEA NZE are widely shared among energy models across intergovernmental organizations, academic institutions, and private sector consultancies. As Figure 2 shows, these additional pathways follow similar trajectories to the IEA NZE and the median of selected IPCC 1.5°C pathways until the middle of the century, implying that the conclusion that there is no room for new oil and gas fields beyond those already in operation or under development is robust across models. Although there are some minor variations



across scenarios, especially in the 2020s, they all show that oil and gas production needs to decrease by at least 65% by 2050.

The rate of oil and gas production decline in each model is affected by the underlying assumptions each model rests on. Those scenarios with the least reliance on carbon sequestration displayed a significantly faster decline in oil and gas production. This indicates that the level of oil and gas production in energy transition pathways is very sensitive to assumptions made regarding levels of carbon sequestration.

### **Box 1. CCS feasibility concerns**

The IPCC's latest assessment report has raised several concerns about the feasibility of scaling up CCS. It assessed that, from now until 2030, CCS in the fossil fuel industry is the most expensive and least effective mitigation option out of a range of technologies (IPCC, 2022). By the end of 2022, there were just 30 commercial CCS projects in operation globally, capturing only about 40 MtCO<sub>2e</sub>. Despite 50 years of attempts to deploy this technology globally, more than 70% of the carbon captured in existing projects is still used for enhanced oil recovery—a process designed to extract more oil from ageing wells (Carter et al., 2023). Moreover, the CCS industry has continuously faced cost overruns and cancellations due to complex functional requirements and constraints related to implementing this technology in different processes (Abdulla et al., 2020; Wang et al., 2021). A combination of high costs, low technological readiness, and a lack of credible financial returns has caused more than 80% of proposed CCS projects in the United States to fail without ever becoming operational (Carter et al., 2023).

## **3. The War in Ukraine Does Not Imply a Need for New Oil and Gas Production**

The war in Ukraine has, like the past oil crises in 1973 and 1979, brought energy security and independence to the forefront of policy priorities. But the focus on energy security has not impeded the green transition. Rather, it has accelerated it. Investments in solar and wind power in Europe boomed in 2022 while coal consumption dropped (Tooze, 2023), and renewable energy capacity in the European Union (EU) is projected to double from 2022 to 2027 (IEA, 2023). In 2022 alone, the EU added a record 41 GW of solar capacity (Jones et al., 2023). The long-term impacts of Russia's invasion of Ukraine favour an energy transition based on renewable energy.

New oil and gas fields and import infrastructure are not an answer to the energy crisis. Based on the selected IPCC pathways, we find that existing global import capacity could meet medium- and long-term European demand without Russian imports if Europe were to reduce gas consumption in line with the 1.5°C target. New gas-supply infrastructure will not come online in time to adequately address the near-term supply crunch. Additional production commonly takes 2–3 years from final investment decision, and 5–10 years from the award of new licences, while construction of new pipelines or liquified natural gas terminals takes several years even after permits are awarded (which itself can also take years).





Moreover, Europe's gas-supply-diversification efforts do not eliminate supply risks. In late 2021, for instance, the Maghreb–Europe gas pipeline was shut down due to a diplomatic dispute between Algeria and Morocco (Rashad et al., 2021). A few months later, Algeria threatened to cut gas supplies to Spain if the latter re-exported the gas to Morocco (Al Jazeera, 2022). In September 2022, fighting erupted between Azerbaijan and Armenia, complicating the EU's ambitions to increase its imports of Azerbaijani gas (Holmes, 2022). Domestic instability in several current or prospective gas exporters in countries in Africa are struggling with domestic stability. For instance, in Mozambique, oil major TotalEnergies had to withdraw its staff from a liquefied natural gas project in 2021 due to the deteriorating security concerns, adds to the uncertainty of the situation (TotalEnergies, 2021).

Rather than approving new oil and gas fields, four elements emerge as central regarding alternatives to gas in Europe: significant reduction in demand and gas savings; fuel switch to alternative energy carriers; a strong uptick in investment in renewables and the energy transition; and a change in the EU gas market model, with possible effects for an emerging green hydrogen market. These measures would provide longer-term energy security while reducing stranded-asset risk. As far as industry is concerned, European corporations had already reacted to a high-price environment prior to the war in Ukraine and reduced demand by approximately 7% (McWilliams & Zachmann, 2022). During the 2022–2023 winter, the EU reduced its energy demand by 20% compared to the previous winter (Keating, 2023).

## 4. A 1.5°C Energy System Will Require Significantly Scaling Up the Annual Rate of Renewable Technology Deployment

Alongside a phase-down in oil and gas production, a 1.5°C world also requires significantly scaling up the annual rate of renewable energy deployment. A comparison between forecasts of expected deployment of wind and solar capacity, based on current policies and 1.5°C pathways, shows a large deployment gap (Figure 3). This gap needs to be bridged in order to supply enough energy to meet the world's energy demand in 1.5°C pathways.

Figure 3 shows that, according to the selected IPCC 1.5°C scenarios and the IEA's NZE scenario, by 2030, annual capacity additions should be at least 2.5 times higher for wind energy and 1.5 times higher for solar power compared to forecasts based on current policies.

All other analyzed scenarios broadly confirm the need to rapidly add far more wind and solar capacity than planned and suggest that more than 1.5 GW of new capacity deployment might be required annually by 2030.

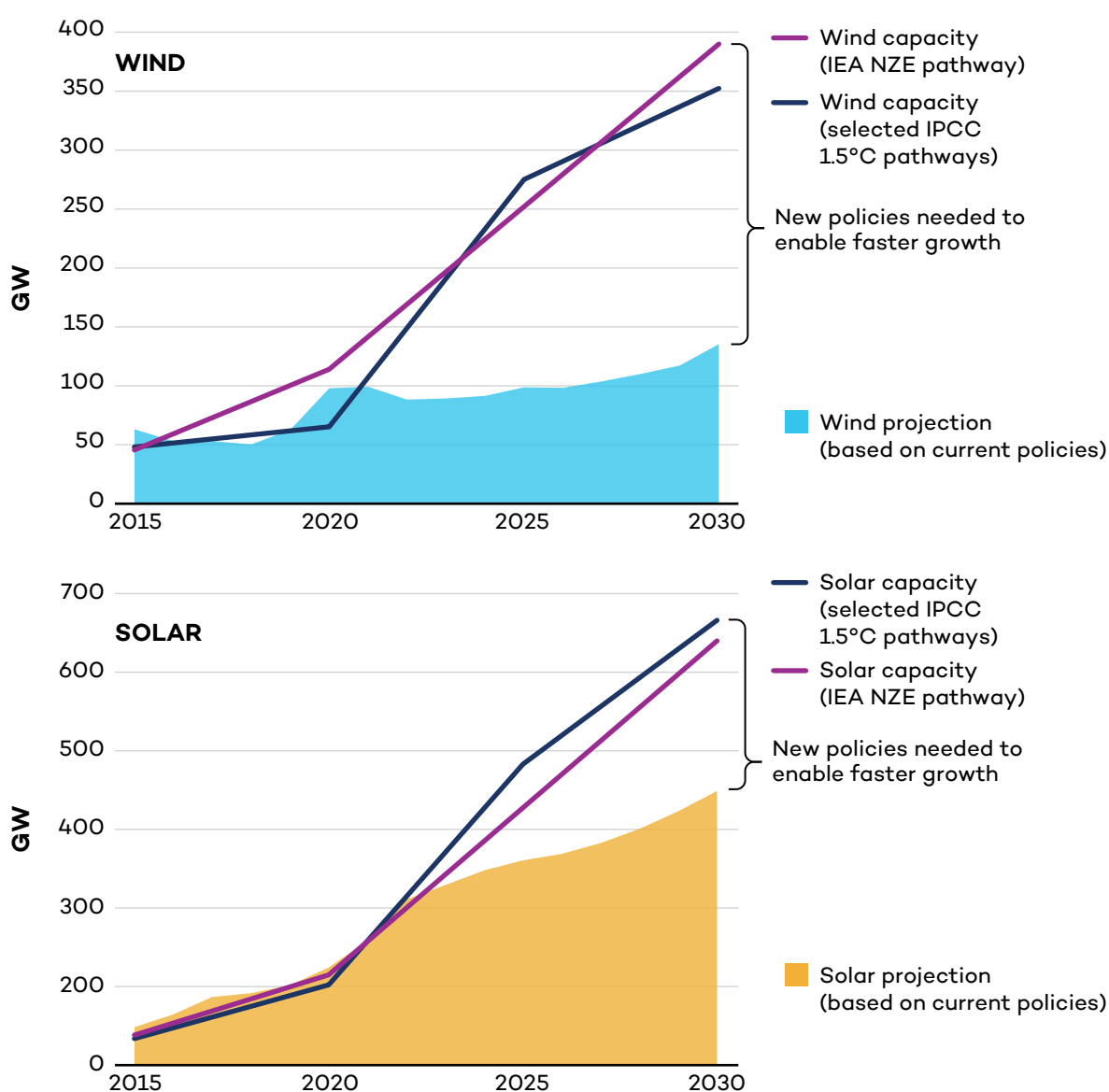
In order to meet these required annual capacity additions, investment in renewables will need to accelerate rapidly during the course of this decade. Selected IPCC 1.5°C pathways show that between now and 2030, annual investment in solar energy needs to increase 3 times over current levels and more than 4.5 times for wind. Together, total annual investments in both wind and solar energy should amount to about USD 830 billion by 2030. However, current investment levels are only expected to deliver USD 380 billion of investment in wind and



solar energy combined by 2030. This leaves an annual investment gap of more than USD 450 billion by 2030 (Bois von Kursk et al., 2022).

Financial institutions need to significantly scale up their investments in renewable energy. BloombergNEF analysis found that to meet the 1.5°C goal, the ratio of investment in low-carbon energy supply to fossil fuel supply needs to increase from the current ~1:1 to a minimum of 4:1 by 2030 (White et al., 2023). Yet in 2021, the Net Zero Banking Alliance collectively underwrote USD 586 billion in low-carbon energy supply, compared with USD 638 billion for fossil fuels (White et al., 2023).

**Figure 3.** Annual wind and solar capacity additions under selected IPCC and IEA 1.5°C pathways



Sources: Byers et al., 2022; IEA, 2022.



Governments have a critical role to play in creating an enabling environment through regulatory frameworks and fiscal reforms for investments to flow away from fossil fuels and toward renewables. Globally, fossil fuels receive subsidies of USD 370 billion per year, while renewable energies receive only USD 100 billion (Bridle et al., 2019). Addressing these imbalances would significantly change the economic and incentive structures in the energy sector. Investors should urge governments to phase out direct and indirect fossil fuel subsidies and to enact relevant policies to speed up the just and sustainable delivery of renewable energy, which would include incentive structures, planning reforms, and updating electricity grids.

## 5. How Financial Institutions Can Accelerate a 1.5°C-Aligned Transition Through Their Financing and Corporate Policy Engagements

The oil and gas industry will need to transform rapidly. The March 2022 Climate Action 100+ Net Zero Company Benchmark considered that only three of 39 oil and gas companies assessed had transition pathways aligned with 1.5°C (as defined by that benchmark), and only one was assessed to have capital expenditures in line with such a scenario (Climate Action 100+, 2022). Similarly, out of 58 oil and gas companies' 2050 targets assessed by the Transition Pathways Initiative (TPI) as of August 2022, only three companies met TPI's definition of a below-2°C benchmark (TPI, 2022).

For financiers, this lack of ambition by many oil and gas companies increases the risk of stranded assets and undermines the industry's social licence to operate. It also threatens global progress to reduce emissions and decarbonize the economy—which is necessary to protect the long-term interests of financial actors that extend beyond the financial performance of only energy companies.

Financial institutions are increasingly restricting lending to oil and gas, and engaging oil companies on new oil and gas fields, indicating momentum and providing a strong foundation for further progress. Some shareholders and asset owners are now using the IEA NZE and One Earth Climate Model (OECM) pathways as an alignment metric in engagements and resolutions (Ceres, 2022). For instance, a number of 2022 resolutions asked banks, insurers, and oil companies to align their financing of new energy projects with the IEA NZE scenario (Ceres, 2022). In 2023, 12 institutional investors along with ShareAction asked a question at the annual general meeting of Barclays about whether the bank would commit to cease financing for new oil and gas fields and associated infrastructure (ShareAction, 2023a). In addition, 30 investors wrote letters to five major banks, urging them to stop directly financing new oil and gas fields (ShareAction, 2023b). On the banking side, La Banque Postale committed to a complete withdrawal from oil and gas upstream and midstream activities by 2030, as well as an immediate suspension of financial services provision to companies contributing to oil and gas expansion (Reuters, 2021). NatWest, Lloyds, HSBC, and BNP Paribas have committed to end project finance for new oil and gas projects (Lamb, 2023; Martin, 2023)—although it should be noted that asset-level financing is only a small percentage of the financing going to top oil and gas expanding companies. The Institutional Investors Group on Climate Change (IIGCC)'s recently published Net Zero Standard for





Oil and Gas includes metrics on whether production plans for oil and gas decline consistently with the IEA NZE scenario, although the standard does not include a metric on whether a company is expanding oil and gas production (IIGCC, 2023a).

Institutional investors are also advocating for greater insight into business strategy by demanding time-bound transition plans that detail how climate targets will be achieved. In January 2022, the British Financial Conduct Authority made it mandatory for listed companies to publish transition plans, on a comply or explain basis (Jones, 2023). The UK Transition Plan Taskforce is producing a disclosure framework for transition plans. Its consultation document states that a transition plan should “outline ambitious objectives and priorities for contributing to and preparing for a rapid and orderly economy-wide net zero transition” (Transition Plan Taskforce, 2022)—making it clear that investors should focus on the need to decarbonize the economy, rather than decarbonizing individual companies. The EU’s Corporate Sustainability Reporting Directive will require the publication of information on whether or not a company has a 1.5°C-aligned transition plan for climate change mitigation (European Financial Reporting Advisory Group, 2022). The United Nations’ High-Level Expert Group on the Net Zero Emissions Commitments of Non-State Entities has made it clear that companies cannot claim to be net-zero while continuing to build or invest in new fossil fuel supply. The Expert Group recommended financial institutions end financing and investing in support of exploration for new oil and gas fields, expansion of reserves, and production (High-Level Expert Group on the Net Zero Emissions Commitments of Non-State Entities, 2022). In June, the IIGCC published a Net Zero Standard for Banks, which encourages them to avoid financing or facilitating new long-lead-time upstream oil and gas projects (IIGCC, 2023b).

Nonetheless, as the results of key climate-related resolutions at the 2023 annual general meetings of many oil majors show, the oil industry’s war-generated windfall profits and accompanying bumps in share price driven by short-term thinking among many financial institutions are an obstacle to financiers calling for the necessary industry transformation. In broad terms, there are two main pathways for this transformation.

**The first is wholesale diversification into renewable energy.** This is currently the favoured option of those oil and gas companies claiming to have net-zero ambitions. However, as TPI analysis shows, very few, if any, oil and gas companies have diversification plans and capital expenditures that are aligned with 1.5°C (TPI, 2022). Meanwhile, all majors are still pursuing new oil and gas developments and thereby risking shareholder capital. This throws into question the effectiveness of this option, both for investors and for the climate.

**The second option is an orderly wind-down of assets and return of capital.** While not the favoured option of companies at present, the idea is gaining some currency among investors. Anton Eser and Nick Stansbury at Legal and General Investment Management have discussed it as a possible model (Eser & Stansbury, 2018), as has the private equity firm Kimmeridge in a white paper (Kimmeridge, 2020). While the wind-down option needs more definition and is a challenging issue for chief executive officers to consider, the continuing divergence between company plans and climate requirements means that shareholders should, at least, explore this option in company engagements. Of course, ending the development of new oil and gas production is a prerequisite to winding down assets.



Continued oil and gas licensing by governments presents twin risks of stranded capital and unsafe levels of global warming. In addition to engaging with companies and policy work on an enabling environment for redirecting capital to renewable energy, financial institutions should proactively and publicly support policy efforts to end oil and gas expansion.

## 6. Recommendations for Financial Institutions

We have set out below a number of recommendations for financial institutions to adopt in the formulation of their own 1.5°C transition plans and their engagements with companies and policy-makers.

- In line with the recommendations of the UN’s High-Level Expert Group, financial institutions should rule out the provision or facilitation of asset or project finance for new oil and gas fields and/or related infrastructure such as pipelines.
- Banks should publish a plan to restrict financing at the corporate level for new oil and gas. This can include (Sood et al., 2022):
  - A commitment to require clients to publish net-zero transition plans by a specific date, setting out detailed expectations for their content, and specifying that these plans must prohibit the development of new oil and gas fields; and
  - A commitment to exclude oil and gas companies with expansion plans.
- Investors should incorporate “no new oil and gas fields and/or related infrastructure” into their engagement with banks, insurers, and oil companies about their net-zero transition plans. This engagement should be time-bound, have appropriate milestones to assess progress as well as escalation steps, and include a willingness to exercise an exit option if there is a lack of progress.
- Investors should interrogate the feasibility of oil companies’ ability to transition their business in line with 1.5°C and explore the alternative pathway of orderly wind-down.
- Key investor climate benchmarks should include an assessment of companies’ allocation of capital expenditure to new oil and gas fields as well as NZE-aligned declines in production levels.
- Financial institutions should include in their public affairs work an end to oil and gas licensing, the phase-out of direct and indirect fossil fuel subsidies, and the creation of an enabling environment for redirecting both public and private capital flows toward the clean energy transition, including the deployment of additional solar and wind capacity.
- Financial institutions should call on governments to better regulate the corporate sector’s net-zero transition plans and targets at both the global and national levels to ensure that they are aligned with the 1.5°C limit—and this should include mandating 1.5°C alignment.



## References

- Abdulla, A., Hanna, R., Schell, K. R., Babacan, O., & Victor, D. G. (2020). Explaining successful and failed investments in U.S. carbon capture and storage using empirical and expert assessments. *Environmental Research Letters*, 16(1), Article 014036. <https://doi.org/10.1088/1748-9326%2Fabd19e>
- Al Jazeera. (2022, April 28). *Algeria threatens to halt gas exports to Spain*. AP. <https://www.aljazeera.com/economy/2022/4/28/algeria-threatens-to-halt-gas-exports-to-spain>
- Bank of England. (2019, January 10). *Climate change: What are the risks to fiscal stability?* <https://www.bankofengland.co.uk/explainers/climate-change-what-are-the-risks-to-financial-stability>
- Bloomberg New Energy Finance. (2021). *New energy outlook 2021*. <https://about.bnef.com/new-energy-outlook/>
- BP. (2022). *BP energy outlook 2022 edition*. <https://apps.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/energy-outlook/bp-energy-outlook-2022.pdf>
- Bridle, R., Sharma, S., Mostafa, M., & Geddes, A. (2019). *Fossil fuel to clean energy subsidy swaps: How to pay for an energy revolution*. Global Subsidies Initiative, International Institute for Sustainable Development. <https://www.iisd.org/system/files/publications/fossil-fuel-clean-energy-subsidy-swap.pdf>
- Byers, E., Krey, V., Krieglner, E., Riahi, K., Schaeffer, R., Kikstra, J., Lamboll, R., Nicholls, Z., Sandstad, M., Smith, C., der Wijst, K., Lecocq, F., Portugal-Pereira, J., Saheb, Y., Stromann, A., Winkler, H., Auer, C., Brutschin, E., Lepault, C., ... Skeie, R. (2022). *AR6 scenarios database*. Zenodo. <https://doi.org/10.5281/zenodo.5886912>
- Carter, A., & Cameron, L. (2023). *Why carbon capture and storage is not a net-zero solution for Canada's oil and gas sector*. International Institute for Sustainable Development. <https://www.iisd.org/articles/deep-dive/carbon-capture-not-net-zero-solution>
- Ceres. (2022, August 1). *Record number of negotiated agreements between investors and companies in 2022 proxy season: Agreements bring scores of stronger climate commitments* [News release]. NewsDirect. <https://www.ceres.org/news-center/press-releases/record-number-negotiated-agreements-between-investors-and-companies-2022>
- Climate Action 100+. (2022). *Net zero company benchmark*. <https://www.climateaction100.org/net-zero-company-benchmark/>
- DNV. (2021). *Pathway to net-zero emissions: Energy transition outlook 2021*. <https://eto.dnv.com/2021/about-pathway-to-net-zero>
- Eser, A., & Stansbury, N. (2018). Oil must face its future as a declining industry. *Financial Times*. <https://www.ft.com/content/bc84470a-6e65-11e8-852d-d8b934ff5ffa>
- European Financial Reporting Advisory Group. (2022). *Draft European Sustainability Reporting Standards: ESRS E1 climate change*. <https://www.efrag.org/Assets/Download?assetUrl=%2Fsites%2Fwebpublishing%2FsiteAssets%2F08%2520Draft%2520ESRS%2520E1%2520Climate%2520Change%2520November%25202022.pdf>



- High-Level Expert Group on the Net Zero Emissions Commitments of Non-State Entities. (2022). *Integrity matters: Net zero commitments by businesses, financial institutions, cities and regions*. United Nations. [https://www.un.org/sites/un2.un.org/files/high-level\\_expert\\_group\\_n7b.pdf](https://www.un.org/sites/un2.un.org/files/high-level_expert_group_n7b.pdf)
- Holmes, O. (2022, September 13). About 100 troops killed in clashes between Armenia and Azerbaijan. *The Guardian*. <https://www.theguardian.com/world/2022/sep/13/deadly-clashes-erupt-in-disputed-territory-between-azerbaijan-and-armenia>
- Institutional Investors Group on Climate Change. (2023a). *Net zero standard for oil & gas*. <https://www.iigcc.org/resource/net-zero-standard-for-oil-gas/>
- Institutional Investors Group on Climate Change. (2023b). *Net zero standard for banks*. <https://www.iigcc.org/download/net-zero-standard-for-banks-june-2023/?wpdmdl=7969&refresh=6479faa90d6801685715625>
- Intergovernmental Panel on Climate Change. (2022). *Sixth assessment report: Working Group III: Mitigation of climate change*. <https://www.ipcc.ch/report/ar6/wg3/>
- International Energy Agency. (2021). *Net zero by 2050: A roadmap for the global energy sector*. <https://www.iea.org/reports/net-zero-by-2050>
- International Energy Agency. (2023). *Russia's war on Ukraine*. <https://www.iea.org/topics/russias-war-on-ukraine>
- International Renewable Energy Agency. (2022). *World energy transitions outlook 2022: 1.5°C pathway*. <https://irena.org/publications/2022/mar/world-energy-transitions-outlook-2022>
- Jones, D., Brown, S., Czyżak, P., Broadbent, H., Bruce-Lockhart, C., Dizon, R., Ewen, M., Fulghum, N., Copsey, L., Candlin, A., Rosslowe, C., & Fox, H. (2023). *European electricity review 2023*. Ember. <https://ember-climate.org/insights/research/european-electricity-review-2023/>
- Jones, H. (2023). *Get cracking on climate transition plans, UK watchdog tells firms*. Reuters. <https://www.reuters.com/business/sustainable-business/get-cracking-climate-transition-plans-uk-watchdog-tells-firms-2023-02-07/>
- Keating, D. (2023, June 2). *Opinion: Europe's energy crisis is not over*. Energy Monitor. <https://www.energymonitor.ai/policy/opinion-europes-energy-crisis-is-not-over/>
- Kimmeridge. (2020). *Preparing the E&P sector for the energy transition: A new business model*. <https://kimmeridge.com/wp-content/uploads/2021/12/Preparing-the-EP-Sector-for-the-Energy-Transition-A-New-Business-Model.pdf>
- Lamb, J. (2023, February 10). *NatWest latest to shun new oil and gas project financing*. Proactive Investors. <https://www.proactiveinvestors.co.uk/companies/news/1005804/natwest-latest-to-shun-new-oil-and-gas-project-financing-1005804.html>
- Martin, R. (2023, June 7). *BNP Paribas exits bond arranging for new oil, gas ventures*. BNN Bloomberg. <https://www.bnnbloomberg.ca/bnp-paribas-exits-bond-arranging-for-new-oil-gas-ventures-1.1929973>
- McWilliams, B., & Zachmann, G. (2022, April 8). *The European Union demand response to high natural gas prices*. Bruegel. <https://www.bruegel.org/blog-post/european-union-demand-response-high-natural-gas-prices>



- Navigant. (2018). *Energy transition within 1.5°C: A disruptive approach to 100% decarbonisation of the global energy system by 2050*. Guidehouse. <https://guidehouse.com/-/media/www/site/downloads/energy/2018/navigant2018energytransitionwithin15c.pdf>
- Rashad, M., Ahmed, H. O., & Chikhi, L. (2021, October 25). *Algeria to end gas supplies to Morocco; Supply Spain directly – Sources*. Reuters. <https://www.reuters.com/world/africa/algeria-end-gas-supplies-morocco-supply-spain-directly-sources-2021-10-25/>
- Reuters. (2021, October 14). *French lender Banque Postale commits to exit oil and gas by 2030*. <https://www.reuters.com/business/sustainable-business/french-lender-banque-postale-commits-exit-oil-gas-by-2030-2021-10-14/>
- Rystad Energy. (2022). *UCube Browser v. 2.3.2*. <https://www.rystadenergy.com/services/upstream-solution>
- ShareAction. (2023a, May 2). *Investor statement – Barclays AGM 2023*. <https://shareaction.org/reports/investor-statement-barclays-agm-2023>
- ShareAction. (2023b, February 10). *Major investors insist Europe’s top banks clean up their act on oil & gas* [Press release]. <https://shareaction.org/news/major-investors-insist-europes-top-banks-clean-up-their-act-on-oil-gas>
- Sood, A., Gray, C., Martin, J., Middleton, J., Marsden, L., Zorila, M., & Levin, X. (2022). *In debt to the planet*. ShareAction. <https://shareaction.org/reports/in-debt-to-the-planet>
- Teske, S., Niklas, S., Nagrath, K., Talwar S., Atherton, A., & Guerrero Orbe, J., (2022). *Sectoral pathways & key performance indicators*. Institute for Sustainable Futures. <https://www.unpri.org/download?ac=12245>
- Tooze, A. (2023). *Europe’s energy crisis that isn’t*. Foreign Policy. <https://foreignpolicy.com/2023/04/05/europe-energy-crisis-security-renewable-solar-wind-nuclear-carbon/>
- TotalEnergies. (2021, April 26). *Total declares force majeure on Mozambique LNG project*. <https://totalenergies.com/media/news/press-releases/total-declares-force-majeure-mozambique-lng-project>
- Transition Pathways Initiative. (2022). *Carbon performance in 2050: All sectors*. <https://transitionpathwayinitiative.org/sectors>
- Transition Plan Taskforce. (2022). *Consultation: The Transition Plan Taskforce Disclosure Framework*. <https://transitiontaskforce.net/wp-content/uploads/2022/11/TPT-Disclosure-Framework.pdf>
- Wang, N., Akimoto, K., & Nemet, G. F. (2021). What went wrong? Learning from three decades of carbon capture, utilization and sequestration (CCUS) pilot and demonstration projects. *Energy Policy*, 158, Article 112546. <https://doi.org/10.1016/j.enpol.2021.112546>
- White, K., Loughhead, R., Linstaedt, J., Rooze, J., & Young, W. (2023, February 28). *Financing the transition: Energy supply investment and bank financing activity*. BloombergNEF. <https://about.bnef.com/blog/financing-the-transition-energy-supply-investment-and-bank-financing-activity/>

© 2023 The International Institute for Sustainable Development  
Published by the International Institute for Sustainable Development

This publication is licensed under a [Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License](https://creativecommons.org/licenses/by-nc-sa/4.0/).

## INTERNATIONAL INSTITUTE FOR SUSTAINABLE DEVELOPMENT

The International Institute for Sustainable Development (IISD) is an award-winning independent think tank working to accelerate solutions for a stable climate, sustainable resource management, and fair economies. Our work inspires better decisions and sparks meaningful action to help people and the planet thrive. We shine a light on what can be achieved when governments, businesses, non-profits, and communities come together. IISD's staff of more than 200 people, plus over 150 associates and consultants, come from across the globe and from many disciplines. With offices in Winnipeg, Geneva, Ottawa, and Toronto, our work affects lives in nearly 100 countries.

IISD is a registered charitable organization in Canada and has 501(c)(3) status in the United States. IISD receives core operating support from the Province of Manitoba and project funding from governments inside and outside Canada, United Nations agencies, foundations, the private sector, and individuals.

### Head Office

111 Lombard Avenue, Suite 325  
Winnipeg, Manitoba  
Canada R3B 0T4

**Tel:** +1 (204) 958-7700

**Website:** [iisd.org](https://iisd.org)

**Twitter:** [@IISD\\_news](https://twitter.com/IISD_news)



[iisd.org](https://iisd.org)