

GETTING ON TRACK TO 1.5°C: THE IEA'S OPPORTUNITY TO STEER INVESTMENTS TOWARDS SUCCESS IN MEETING THE PARIS GOALS

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The International Energy Agency (IEA) says it wants to be at the forefront of climate action, yet it has historically published energy scenarios that are biased towards the fossil fuel industry and guide governments and investors towards failure in meeting the Paris Agreement goals.¹ Because its scenarios are used as a “gold standard” worldwide,² they risk becoming a self-fulfilling prophecy: The IEA misdirects investment into fossil fuels, which in turn locks in the dangerously high levels of fossil fuel demand that its scenarios project.³

This year, the IEA has a crucial opportunity to get on track. After years of pressure from investors, business leaders, climate scientists, and climate leaders,⁴ the IEA has finally pledged to develop an energy scenario that it says will “put emissions on a path in line with a temperature rise of 1.5 degrees Celsius(°C).”⁵ The IEA refers to this forthcoming scenario as its roadmap to net-zero emissions by 2050. It plans to release this new scenario in a May 2021 special report.

This commitment must be the starting point, not an endpoint, of meaningful IEA reform.

To effectively guide the world towards 1.5°C-aligned investment, the IEA must:

- 1. Include a 1.5°C-aligned scenario at the center of all its work, making it the core scenario in the World Energy Outlook from 2021 onwards.** The IEA cannot guide energy investment in line with 1.5°C if it sidelines this pathway in its most influential publication.
- 2. Adopt a precautionary framework for its 1.5°C scenario that prioritizes the well-being of people, not prolongs the fossil fuel era. Specifically, this means:**
 - a. Prioritizing immediate and rapid action to phase out fossil fuels.
 - b. Avoiding large-scale reliance on unproven carbon-dioxide removal or storage strategies, which create intergenerational injustice and increase the risk of mitigation failure.⁶

In the analysis that follows, we explain how the IEA has veered off track in the past, and what it needs to do to correct course this year.

MAKE 1.5°C THE CORE WEO SCENARIO

IEA Director Dr. Fatih Birol has finally committed to develop a fully-fledged 1.5°C energy scenario, but he has not yet pledged to include this new scenario in the 2021 World Energy Outlook (WEO), let alone position it as the central scenario. To guide policies and investments towards a future fully aligned with the Paris goals, the

IEA must put a 1.5°C-aligned scenario at the heart of the WEO, rather than continue prioritizing and providing the most detail for scenarios that lack adequate ambition on climate.⁷

Since governments reached the Paris Agreement in 2015, agreeing to “pursu[e] efforts to limit the temperature increase to 1.5°C above pre-industrial levels,”⁸ the IEA has:

- ❶ Continued to position as the central, default WEO scenario, a scenario that steers investment towards a catastrophic 3°C of global warming (now called the Stated Energy Policies Scenario, or STEPS).
- ❷ Given incrementally more emphasis to its Sustainable Development Scenario (SDS) but failed to increase its ambition to fully align with the Paris goals. The SDS is designed to limit warming below 2°C. It would not reach net-zero emissions until 2070 – 20 years too late according to the analysis of 1.5°C pathways by the Intergovernmental Panel on Climate Change (IPCC).⁹
- ❸ The IEA took a small step forward in 2020 by introducing a 1.5°C energy case with data up to 2030. But the IEA omitted its implications for fossil fuel investment from key sections of the WEO and crucially from the data tables that are used to interpret and extrapolate WEO findings.¹⁰

1 Greg Muttitt, *Off Track: The IEA and Climate Change How the International Energy Agency Guides Energy Decisions towards Fossil Fuel Dependence and Climate Change*, Oil Change International, April 4, 2018, <http://priceofoil.org/2018/04/04/off-track-the-iea-and-climate-change/>.

2 IEA, “World Energy Outlook,” <https://www.iea.org/topics/world-energy-outlook>.

3 Liam Denning, “IEA 2019 World Energy Outlook Comforts No One,” Bloomberg, November 13, 2019, <https://www.bloomberg.com/opinion/articles/2019-11-13/iea-2019-world-energy-outlook-comforts-no-one?srnd=opinion>.

4 Akshat Rathi and Eric Roston, “The World’s Most Influential Energy Model Needs a Climate Update,” Bloomberg, May 29, 2020, <https://www.bloomberg.com/news/articles/2020-05-29/iea-s-world-energy-outlook-needs-a-1-5-c-climate-change-scenario>.

5 IEA, “IEA to produce world’s first comprehensive roadmap to net-zero emissions by 2050,” January 11, 2021, <https://www.iea.org/news/iea-to-produce-world-s-first-comprehensive-roadmap-to-net-zero-emissions-by-2050>.

6 Chapter 7 of the Intergovernmental Panel on Climate Change’s 2018 Special Report on Global Warming of 1.5 Degrees finds “high agreement” that “prioritising early decarbonisation with minimal reliance on CDR decreases the risk of mitigation failure and increases intergenerational equity” (20), https://www.ipcc.ch/site/assets/uploads/2019/08/2i-Chapter-7_FINAL.pdf.

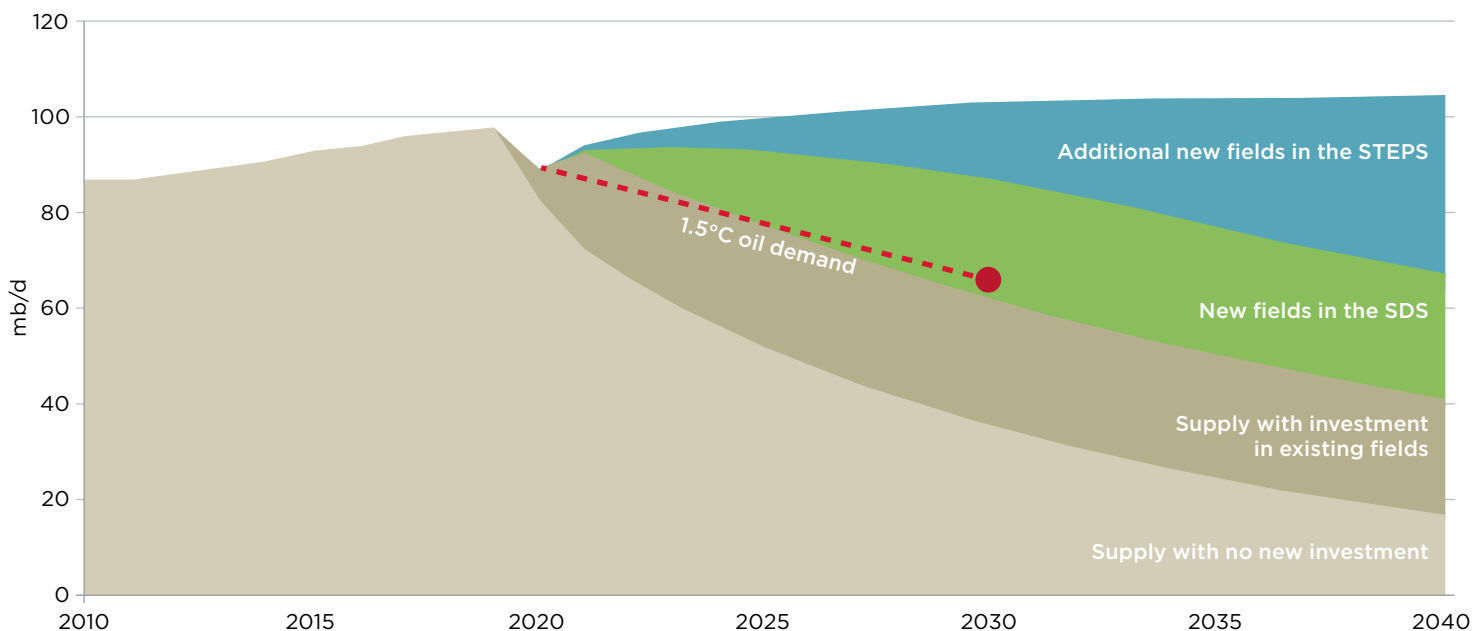
7 Muttitt, *Off Track*.

8 UNFCCC, “Paris Agreement,” 2015, https://unfccc.int/sites/default/files/english_paris_agreement.pdf.

9 Kelly Trout, “The IEA and WEO 2019: Still working for fossil fuels, not global climate goals,” Oil Change International, November 13, 2019, <http://priceofoil.org/2019/11/13/iea-2019-weo-working-for-fossil-fuels-not-climate/>.

10 David Tong, “WEO 2020: A small step when the world needs a giant leap,” Oil Change International, October 22, 2020, <http://priceofoil.org/2020/10/22/weo-2020-a-small-step-when-the-world-needs-a-giant-leap/>.

Figure 1: IEA's figure of global oil demand by field type and scenario, with 2030 1.5°C-aligned demand added



Source: WEO 2020, adapted by Oil Change International to show the IEA's 2030 demand estimate.

The IEA's forthcoming, full 1.5°C energy scenario must be central to the WEO's analysis and conclusions. **Otherwise, the IEA risks misdirecting trillions of dollars towards new oil and gas development.**

The following chart (Figure 1), adapted from WEO 2020, helps to illustrate how this works:

- ❶ Taken from Chapter 7 on fuel supply, the IEA's figure shows projected oil demand under the SDS (<2°C) and STEPS (3°C) scenarios, compared to projected supply from existing versus new fields.¹¹
- ❷ The IEA's *original* figure omitted the projections up to 2030 from its 1.5°C case. In that mini-scenario, **the IEA projected oil demand would drop to 65 million barrels per day (mb/d) by 2030**, a 34 percent decline from 2019 levels.¹²
- ❸ By superimposing the IEA's projection of 1.5°C-aligned oil demand onto the figure, **we find that the IEA's own data show virtually all investment in new oil field development is incompatible with 1.5°C.**

By emphasizing fossil fuel demand and investment pathways that would push the world beyond 1.5°C of warming, the IEA normalizes overreliance on fossil fuels, making pathways that are incompatible with global climate goals the "default" to governments and investors. The roadmap towards success in meeting the full ambition of the Paris Agreement must be at the heart of the WEO – not roadmaps to more extreme climate devastation.

ELIMINATE OVERRELIANCE ON FOSSIL GAS

A 2020 study by Dr. Sven Teske at the University of Sydney found that, "WEO scenarios exhibit signs of a consistent bias towards describing future pathways – including those with specific climate constraints – that create minimum disruption to the incumbent fossil fuel industry."¹³

In its climate-focused scenarios, the IEA has consistently projected an expanded role for fossil gas and actively promoted investment in new gas infrastructure, even as solar and wind sources become more

cost-effective in the power sector.¹⁴ Major oil and gas companies seize on IEA analysis to justify their own gas expansion plans to investors. For example, Total cites the SDS in claiming that "gas consumption will soar between now and 2040."¹⁵

The 1.5°C case the IEA published in WEO 2020 continued this pattern of bias.¹⁶ In a change from the SDS, the new case does project an overall decrease in gas use to 2030. However, the rate is significantly slower compared to 1.5°C pathways that show relative precaution on deployment of carbon dioxide removal (CDR) measures and carbon capture and storage (CCS).

By comparison:

- ❹ The IEA's 1.5°C case (NZE2050) projects only a 9 percent drop in gas demand over this decade (the yellow line in Figure 2).
- ❺ By contrast, the 2020 *Production Gap Report* indicates that gas should decline by 3 percent annually to 2030 – or 30 percent over this decade – to provide a 50-50 chance of limiting warming to 1.5°C.¹⁷

11 IEA, World Energy Outlook 2020, at p. 259.

12 Ibid., at p. 131.

13 Dr. Sven Teske, IEA World Energy Outlook: A critical review 2000-2020, Institute for Sustainable Futures, University of Technology Sydney, October 2020, <https://www.uts.edu.au/research-and-teaching/our-research/institute-sustainable-futures/our-research/energy-futures/iea-world-energy-outlook-critical-review-2000-2020>.

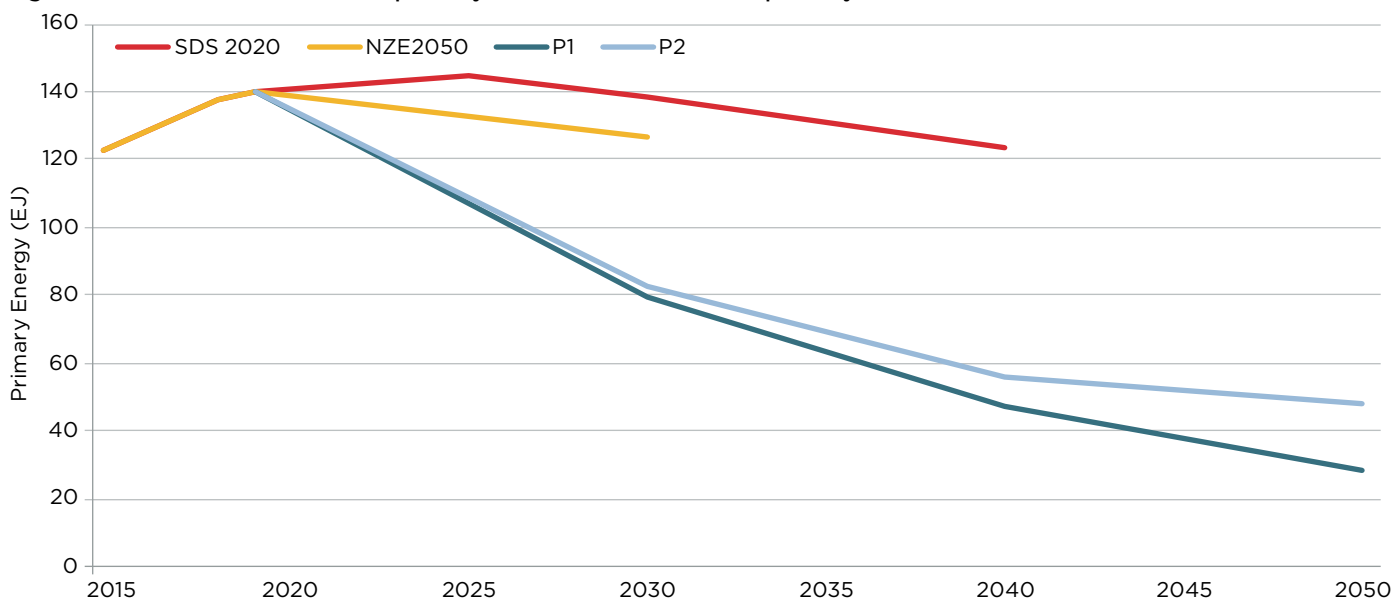
14 Nathan Lemphers and Lorne Stockman, "Risky Wager: The IEA's Bet on Fossil Gas and the Need for WEO Reform," Oil Change International, October 2019, <http://priceofoil.org/2019/10/31/iea-gas-risk/>.

15 Total, "Integrating Climate into our Strategy," August 2019, at p. 28, <https://www.total.com/media/news/press-releases/2019-climate-report-total-reviews-its-membership-industry-associations-line-their-climate-stance>.

16 Tong, "WEO 2020."

17 SEI, IISD, ODI, E3G, and UNEP, The Production Gap Report: 2020 Special Report, 2020, <http://productiongap.org/2020report>.

Figure 2: Gas demand in IEA climate pathways vs. IPCC illustrative 1.5°C pathways with CDR constraints



Source: WEO 2020, IPCC/IAMC 1.5°C Scenario Explorer

- ❶ In the P1 and P2 pathways featured in the IPCC’s Special Report on 1.5°C, **gas demand is more than 40 percent lower than 2019 levels by 2030** (the blue lines in Figure 2).¹⁸
- ❷ P1 and P2 are the illustrative pathways from the IPCC report that model the greatest focus on sustainability and lowest reliance on CDR and CCS, which remain unproven at scale.

In developing its fully-fledged 1.5°C scenario, the IEA needs to turn a new corner. Its new scenario should follow an overall emissions reduction trajectory that aligns with that of 1.5°C pathways oriented towards sustainability and precaution on CDR. The IEA must emphasise emissions cuts across all sources and prioritize rapid action to phase out fossil fuels.

ABANDON UNREALISTIC PROJECTIONS FOR CCS

The relatively high levels of fossil gas reliance discussed above are enabled in part by the IEA’s unrealistic assumptions about the pace of CCS deployment. Rather than accelerate deployment of solutions to reduce energy demand and permanently replace fossil fuels, the IEA’s 1.5°C case from WEO 2020 assumes a rapid scale-up of CCS that defies the technology’s poor track record:

- ❶ The IEA’s 1.5°C case assumes CCS projects will capture 1,150 million tonnes (Mt) of carbon-dioxide (CO₂) pollution in 2030.¹⁹ This is 2.5 times more CCS than is assumed under the IPCC’s P2 pathway in 2030 (P1 does not rely on CCS).²⁰
- ❷ The world’s current CCS capacity is only 40 Mt, most of which is used to increase oil extraction.²¹

- ❸ The IEA’s own assessment of CCS projects (Figure 3) shows just 10 Mt of CCS capacity coming online in the power sector by 2025.²²
- ❹ A recent review of the potential for CCS in 1.5°C-aligned mitigation, prepared by climate researchers at the Tyndall Centre, concluded that **fossil fuel-based CCS is incapable of delivering significant emissions reductions before 2030**.²³

Many Big Oil and Gas companies use promises of future CCS deployment as a justification for prolonging the extraction and use of fossil fuels in the near term.²⁴ But they have yet to deliver. In explaining why his company will not invest in CCS, the CEO of Italian utility giant ENEL summarized, “We already tried CCS in the past and it didn’t lead to success. So why do it again?”²⁵

18 Daniel Huppmann, et al., “IAMC 1.5°C Scenario Explorer and Data hosted by IIASA,” Integrated Assessment Modeling Consortium & International Institute for Applied Systems Analysis, 2019, <http://data.ene.iiasa.ac.at/iamic-1.5c-explorer>.

19 IEA, WEO 2020, at p. 140.

20 Huppmann et al., “IAMC 1.5°C Scenario Explorer and Data hosted by IIASA.”

21 Samira Garcia Freites and Christopher Jones, A Review of the Role of Fossil Fuel-Based Carbon Capture and Storage in the Energy System, Tyndall Centre, January 2021, at p. 12, https://www.research.manchester.ac.uk/portal/files/184755890/CCS_REPORT_FINAL_v2_UPLOAD.pdf.

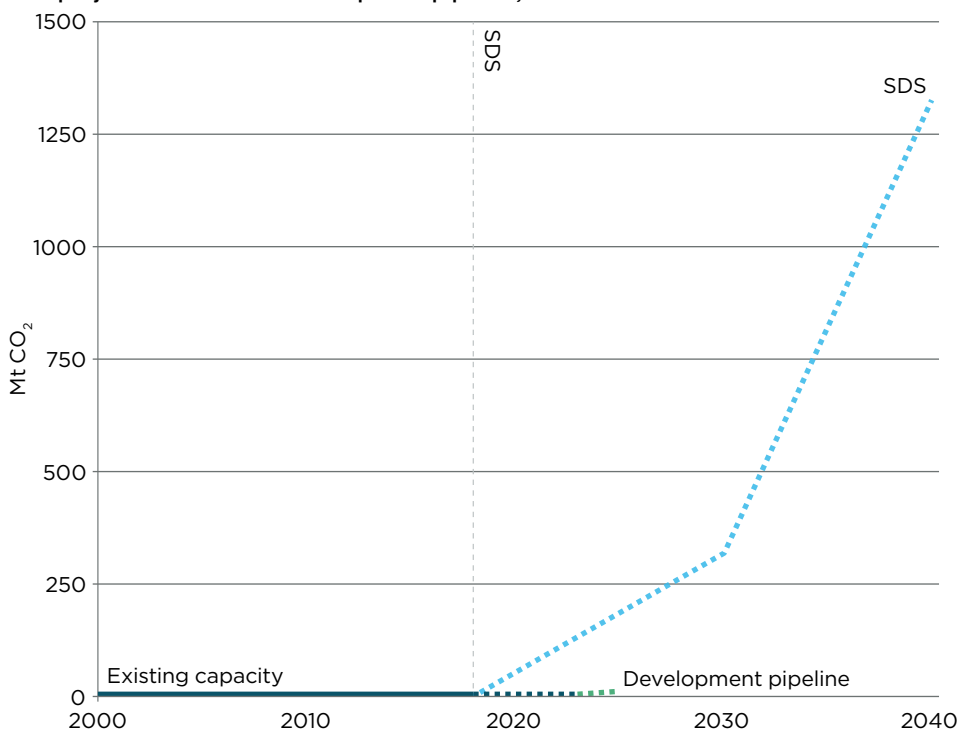
22 IEA, “CCUS in Power,” June 2020, <https://www.iea.org/reports/ccus-in-power>.

23 Garcia Freites and Jones, Role of Fossil Fuel-Based CCS.

24 David Tong and Kelly Trout, “Big Oil Reality Check — Assessing Oil And Gas Climate Plans,” Oil Change International, September 23, 2020, <http://priceofoil.org/2020/09/23/big-oil-reality-check/>.

25 Yannic Rack, “Enel to phase out gas as part of 2050 net zero pledge, dismisses carbon capture options,” S&P Global Intelligence, February 1, 2021, <https://ieefa.org/enel-to-phase-out-gas-as-part-of-2050-net-zero-pledge-dismisses-carbon-capture-options/>.

Figure 3: Large-scale CO₂ capture projects in power generation, SDS projections vs. actual development pipeline, 2000-2040



Source: IEA

The IEA's forthcoming scenario should be based on realistic projections of CCS deployment – which point towards minimal relevance in this decade – and fast track proven solutions that will permanently phase fossil fuels out of the energy system.

ADOPT PRECAUTION ON NEGATIVE EMISSIONS TECHNOLOGIES

The IEA's 1.5°C energy scenario should show governments, investors, and businesses what it will take to meet our climate goals *without* gambling on large-scale reliance on carbon dioxide removal, also referred to as negative emissions technologies (NETs).

The IPCC calls large-scale reliance on CDR a “major risk in the ability to limit warming to 1.5°C” because it remains unproven at scale.²⁶ The IEA has acknowledged this risk in the past, warning that climate pathways reliant on negative emissions would “exacerbate the likelihood of adverse physical impacts arising from climate change”²⁷ and “could have negative consequences outside the energy system related to land use, biodiversity and food security.”²⁸

The 1.5°C case in WEO 2020 did not include significant levels of bioenergy with carbon capture and storage (BECCS) – the main form of NETs in the energy sector. But that is because its data stopped in 2030. The IEA has previously suggested that

massive levels of BECCS could be deployed after 2050 to redirect the SDS towards a 1.5°C trajectory.²⁹ The IEA used misleading comparisons to IPCC scenarios as a “smoke screen” to justify those assumptions.³⁰

In developing its full 1.5°C scenario, the IEA must fully embrace precaution – not excuse risky assumptions on the basis that other scenarios make them too. Of the 53 no- or low-overshoot 1.5°C scenarios assessed in the IPCC 1.5°C report, more than half exceeded the 2050 sustainability limits for deployment of afforestation and/or BECCS cited in the same report.³¹ A 2020 report by Chatham House concludes that:³²

[BECCS’] prevalence in the models is not based on a comprehensive analysis of its feasibility and impacts, and often rests on the erroneous assumption that biomass for energy is inherently carbon-neutral. To the contrary, **there are many reasons to conclude that BECCS cannot be deployed at the scales assumed in the majority of Paris-compliant emissions pathways.**

If carbon budgets are exceeded, and NETs fail to materialize at scale or prove effective, then humanity’s chance at stabilizing the climate at agreed levels would be gone. The IEA must avoid incorporating this unjust, risky gamble into its own 1.5°C scenario.

GUIDE GOVERNMENTS TOWARDS A MANAGED AND JUST PHASE-OUT OF FOSSIL FUEL PRODUCTION

Effectively tackling the climate crisis is not simply a question of addition, or ramping up new clean technologies. It is also a challenge of subtraction – winding down the industries whose pollution is causing the problem.^{33,34} Yet, the IEA’s analysis has

26 J. Rogelj, D. Shindell, K. Jiang, S. Ffita, P. Forster, V. Ginzburg, C. Handa, H. Khesghi, S. Kobayashi, E. Kriegler, L. Mundaca, R. Séférian, and M.V.Vilariño, “Mitigation Pathways Compatible with 1.5°C in the Context of Sustainable Development,” In: Global Warming of 1.5°C. An IPCC Special Report [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)], 2018, at p. 96, https://www.ipcc.ch/site/assets/uploads/sites/2/2019/05/SR15_Chapter2_Low_Res.pdf.

27 IEA, *World Energy Outlook 2016*, at p. 335.

28 IEA, *World Energy Outlook 2019*, at p. 123.

29 Trout, “The IEA and WEO 2019.”

30 Chloé Farand, “IEA World Energy Outlook outlines 1.5C scenario,” Climate Home News, November 13, 2019, <https://www.climatechangenews.com/2019/11/13/iea-world-energy-outlook-outlines-1-5c-scenario/>.

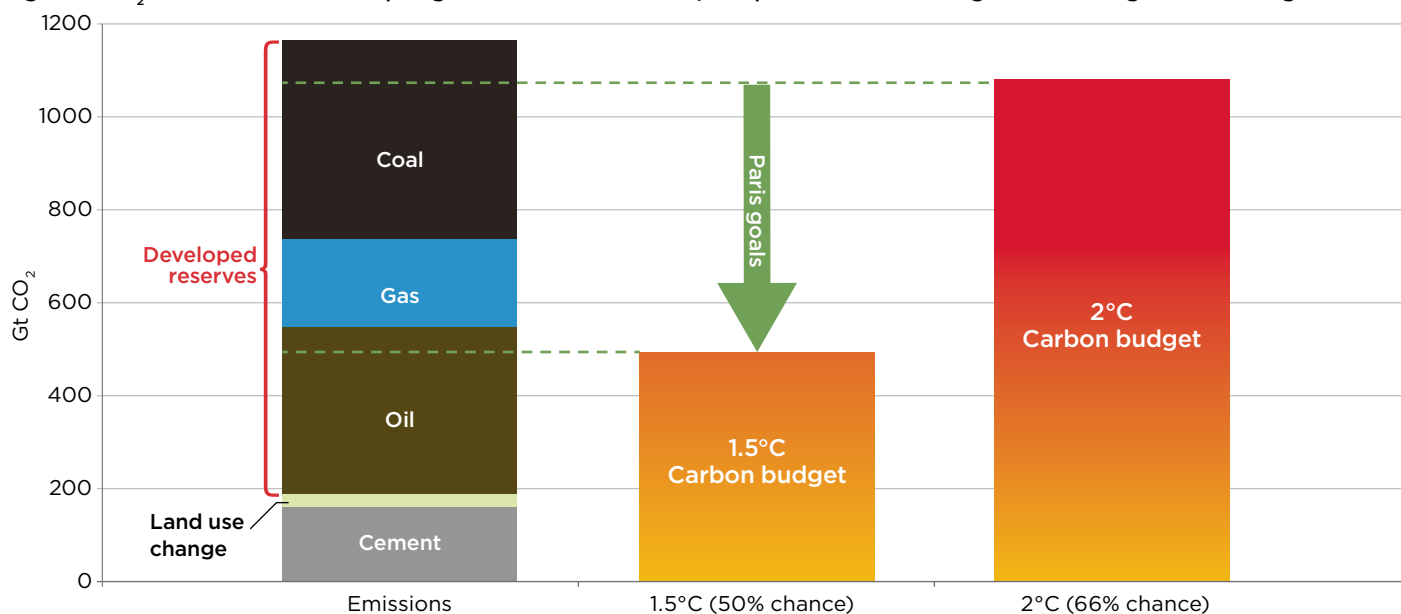
31 Based on own analysis of IPCC SR1.5 scenarios database and the BECCS and afforestation sustainability limits from Fuss et al. (2018) cited in Chapter 4 of Global Warming of 1.5°C, p. 342-43, https://www.ipcc.ch/site/assets/uploads/sites/2/2019/05/SR15_Chapter4_Low_Res.pdf.

32 Duncan Brack and Richard King, Net Zero and Beyond What Role for Bioenergy with Carbon Capture and Storage?, Chatham House, January 2020, at p. 18, <https://www.chathamhouse.org/2020/01/net-zero-and-beyond-what-role-bioenergy-carbon-capture-and-storage>.

33 Richard York and Shannon Bell, “Energy transitions or additions?: Why a transition from fossil fuels requires more than the growth of renewable energy” Energy Research and Social Science (51) May 2019 at p. 40-43, <https://www.sciencedirect.com/science/article/abs/pii/S2214629618312246>.

34 Kelly Trout, “Deep Dive: 5 reasons governments must act now to phase out oil and gas production,” Oil Change International, May 20, 2020, <http://priceofoil.org/2020/05/20/deep-dive-5-reasons-governments-must-act-now-phase-out-oil-gas-production/>.

Figure 4: CO₂ emissions from developed global fossil fuel reserves, compared to carbon budgets within range of the Paris goals



Sources: Oil Change International analysis based on data from Rystad Energy, IEA, World Energy Council, IPCC and Global Carbon Project. Carbon budgets shown are as of 1 January 2020.

historically sidestepped the urgent need for government action to manage a just and rapid decline of fossil fuel extraction that both meets the Paris goals and protects affected workers and communities.

In WEO 2020, the IEA warned that the world had already built enough fossil fuel-burning (or demand) infrastructure to lock in 1.65°C of global warming and discussed the need for early decommissioning of some of this infrastructure.³⁵ However, the IEA remained largely silent on, or continued to promote, the expansion of fossil fuel extraction (or supply) infrastructure. On supply, the IEA focused on policy levers such as methane regulation or investment in CCS that offer minimal disruption to fossil fuel incumbents while being insufficient to ensure a 1.5°C-compatible decline of production.

This is a massive oversight for an agency seeking to position itself as a leader on the energy transition. Existing analysis shows that:

- Total oil, gas, and coal production must decline by 6 percent annually this decade to align with a 1.5°C limit, yet governments are currently planning to increase production 2 percent per year.³⁶

- Already developed oil, gas, and coal extraction facilities contain enough reserves to push the world well beyond the Paris Agreement limits (Figure 4).³⁷ **Moreover, a significant portion of already operating oil and gas fields and coal mines will need to be phased out early to keep warming below 1.5°C.**

The IEA's forthcoming analysis, and all its climate-oriented work, should:

- **Acknowledge and address the risks of carbon lock-in from new investment in fossil fuel extraction.**
- **Meaningfully consider policies governments can implement to manage the phase-out of production in line with a 1.5°C warming limit**, including banning new licensing of fossil fuel exploration and extraction and removing subsidies for fossil fuel production.
- **Fully address the equity and just transition dimensions of a fossil fuel phase-out.** The Lofoten Declaration, signed by over 700 civil society organisations worldwide,³⁸ as well as recent scholarship,³⁹ stress the urgency that wealthy fossil fuel producers – many of them the same OECD countries the IEA represents – should move first and fastest to phase out their production.

Additionally, rich countries should provide resources to countries with greater economic dependence on fossil fuels and less capacity to manage a rapid and socially just transition.

CONCLUSION

The IEA has taken a critical step towards reform by committing to produce an energy scenario compatible with limiting global warming to 1.5°C. But the new scenario must have both scientific integrity and staying power to truly position the IEA as a leader in steering the world on track towards global climate goals. The IEA can provide a transformative tool for governments to align their energy investments with a 1.5°C path by:

- **Making a 1.5°C-aligned scenario the core scenario in the 2021 *World Energy Outlook* and all of the IEA's climate analysis.**
- **Developing a scenario that reflects principles of precaution and equity. The IEA must prioritize immediate and rapid action to phase out fossil fuels and minimize reliance on unproven technologies that prolong fossil fuel use and increase the risk of mitigation failure.**

³⁵ IEA, WEO 2020, at p. 22.

³⁶ SEI, IISD, ODI, E3G, and UNEP, The Production Gap Report.

³⁷ Greg Muttitt, The Sky's Limit: Why the Paris Climate Goals Require a Managed Decline of Fossil Fuel Production, Oil Change International, September 2016, <http://priceofoil.org/2016/09/22/the-skys-limit-report/>. Carbon budgets updated: IPCC, SR15, Table 2.2, p. 108 and adjusted to a 2020 baseline using Global Carbon Project data on global CO₂ emissions in 2018 and 2019; Oil and gas developed reserves updated: Rystad UCube, accessed August 2020.

³⁸ "Lofoten Declaration," August 2017, <http://www.lofotendeclaration.org/>.

³⁹ Greg Muttitt and Sivan Kartha, "Equity, climate justice and fossil fuel extraction: principles for a managed phase out," Climate Policy, Special Issue: Supply-side Fossil Fuel Policies, May 2020, <https://www.tandfonline.com/doi/full/10.1080/14693062.20.20.1763900>.



Oil Change International is a research, communications, and advocacy organization focused on exposing the true costs of fossil fuels and facilitating the ongoing transition towards clean energy.

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