

STILL OFF TRACK: HOW THE INTERNATIONAL ENERGY AGENCY'S 2019 OUTLOOK CONTINUES TO UNDERMINE GLOBAL CLIMATE GOALS

SUMMARY

Published every November, the International Energy Agency's *World Energy Outlook (WEO)* gives a picture of energy demand and supply until 2040. It is the global authority on the topic and in turn is used by governments and investors to inform and justify significant decisions related to energy and energy infrastructure. The scenarios the IEA includes in the WEO have a track record of steering decisions towards an overreliance on fossil fuels, and do not provide a roadmap for limiting global warming to 1.5 degrees Celsius (°C).¹

❖ **The IEA is under mounting pressure from governments, business leaders, energy experts, and climate scientists to reform the WEO to align fully with the Paris Agreement goals: to develop a robust, precautionary 1.5°C-aligned energy scenario and to make this the central scenario in its flagship publication.**

In 2019, the IEA responded to calls for greater ambition and transparency with some minor changes. Updates to WEO 2019 include a name change for the business-as-usual scenario from the New Policies Scenario (NPS) to the Stated Policies Scenario (STEPS), as well as an extension of the Sustainable Development Scenario (SDS) from 2040 to 2050. WEO 2019 also includes a brief sketch of a 1.5°C pathway.

These changes are welcome but do not include the critical substantive shifts needed to align with Paris ambition:

1. The WEO's default scenario leads towards climate breakdown.

The majority of the report is dedicated to the newly renamed "Stated Policies Scenario" (STEPS), a pathway which, in the IEA's assessment, would lead to between 2.7 and 3.2°C of warming.

2. The WEO omits a credible 1.5°C pathway, yet investment decisions must align with that limit immediately.

The "Sustainable Development Scenario" (SDS) is supposed to reflect a pathway to achieving the energy-related Sustainable Development Goals (SDGs), but it takes the world beyond 1.5°C of warming and reaches net zero 20 years too late according to the best available science.

3. The IEA suggests that risky, unproven technologies can compensate for the excess burning of fossil fuels.

The IEA continues to indicate that the SDS's shortfall in ambition could be balanced out through massive reliance on negative emissions technologies (NETs) after 2050, ignoring warnings from the Intergovernmental Panel on Climate Change (IPCC) that reliance on large-scale NETs is a "major risk in the ability to limit warming to 1.5°C."²

4. The WEO continues to project large deployments of capital into the development of new fossil fuels.

WEO 2019 projects and endorses significant expansion of fossil gas that is incompatible with precautionary, 1.5°C-aligned pathways assessed by the IPCC. Even the SDS projects more than USD 11 trillion in total upstream oil and gas investment from 2021 to 2050, including more than USD 5 trillion to develop new oil and gas fields. Similar to the 2018 SDS, gas use would increase to 2030 and not decline significantly until after 2040.

The IEA is facing mounting public pressure related to its role in enabling fossil fuel expansion. There was a dramatic shift in media narrative around the launch of WEO 2019, with most mainstream media covering the shortfalls of IEA scenarios vis-a-vis climate goals.³ A growing campaign to 'Fix The WEO' is also generating significant pressure on the agency to break from its fossil fuel roots and reform its scenarios to align with climate safety.

In recent months, the IEA has moved to position itself publicly as a leader on climate change. In February 2020, the organisation launched a 'Grand Coalition,' initiative, aiming to "bridge the gap between energy and climate goals."⁴ Since the outbreak of COVID-19, IEA Executive Director Dr. Fatih Birol has also urged governments to ensure clean energy is at the heart of fiscal stimulus packages.⁵ However, the IEA's bid for climate leadership lacks credibility, given that the agency's own scenarios and messaging continue to steer the world off track from meeting the Paris goals.⁶

In order to retain relevance with political and financial decision-makers, the IEA must urgently make a 1.5°C scenario the central scenario in the 2020 World Energy Outlook. This scenario must also take a precautionary approach to negative emissions technologies.

WEO 2019 ANALYSIS

WEO 2019 UPDATES

In response to pressure, the IEA made some modest changes in WEO 2019.⁷

- ❖ The business as usual New Policies Scenario (NPS) was renamed to the more appropriate Stated Policies Scenario (STEPS).
- ❖ The Sustainable Development Scenario (SDS), a secondary scenario that models greater ambition, receives incrementally more weight compared to previous years.
- ❖ The SDS includes an extension from 2040 to 2050, which improves data transparency.
- ❖ WEO 2019 also includes a sketch of an energy pathway towards stabilisation at 1.5°C in a very short section at the very end of the Sustainable Development chapter.

These changes, however, are far from sufficient to guide policy and investment decisions towards a 1.5°C warming limit.

“Such minor improvements ... should not be mistaken for delivering upon urgently needed substantial changes ... As the WEO can become a self fulfilling prophecy, it carries a major responsibility.” - *Open Letter to the IEA from 60 Business and Civil Society Leaders*⁸

“The IEA is effectively creating its own reality. They project ever-increasing demand for fossil fuels, which in turn justifies greater investments in supply, making it harder for the energy system to change.”¹⁰ - *Andrew Logan, CERES*

SCENARIO POSITIONING

The WEO continues to guide users towards a 3°C trajectory with its central business-as-usual scenario.

The majority of the WEO is dedicated to the Stated Policies Scenario. The new name, replacing the New Policies Scenario, is a more accurate descriptor of the scenario, which reflects existing policies and targets (i.e. business-as-usual). However, the STEPS continues to, in the IEA’s own words, occupy “a central position in the WEO analysis.”⁹ In practice, this means that a 3°C scenario will continue to be the default scenario for the large majority of WEO users and energy decision-makers; the resulting policies and investments can make it a self-fulfilling prophecy.

CLIMATE AMBITION

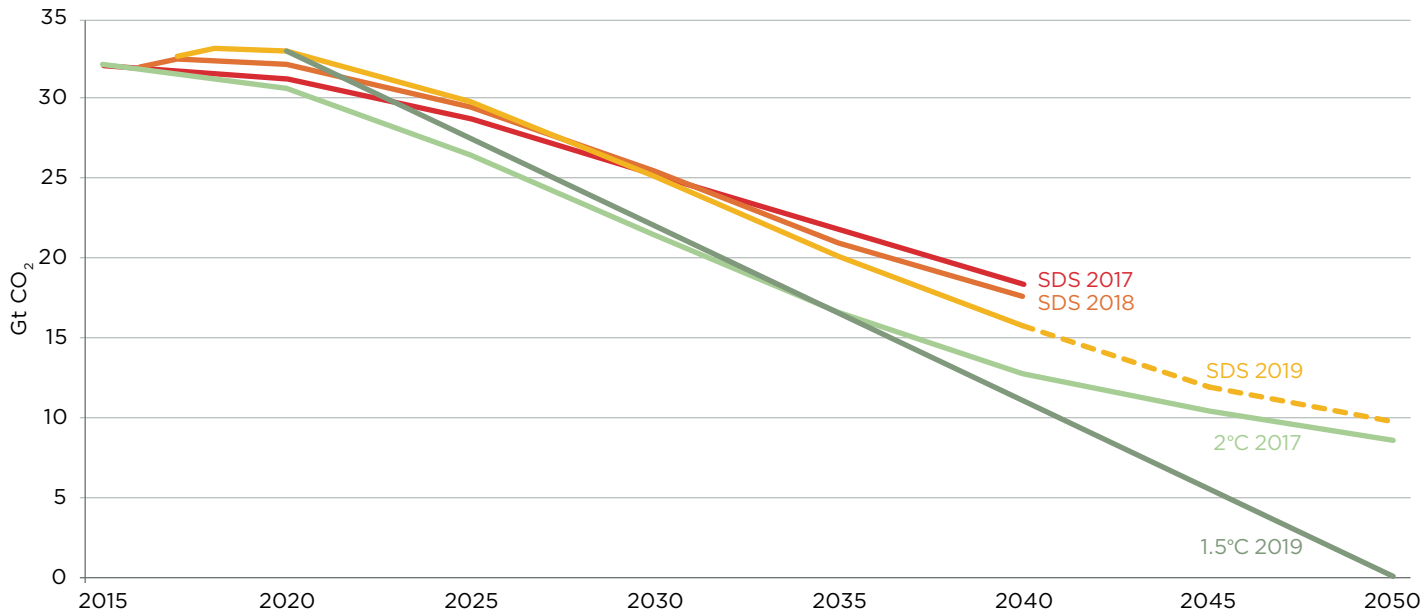
The IEA has yet to develop a robust and precautionary 1.5°C energy scenario that aligns with the full range of goals of the Paris Agreement.

Limited ambition in the 2019 SDS

The IEA has stated that its SDS is “fully aligned with the Paris Agreement.”¹¹ This section unpacks the scenario’s shortfalls and sets out the ways in which it is not Paris-aligned.

The IEA has not meaningfully increased the ambition of the SDS in 2019, with emissions trajectories similar to recent years (see *Figure 1 below*). By 2040, the emissions level of the 2019 SDS is just under 2 Gigatons (Gt) lower than in the 2018 SDS. The overall emissions trajectory of the SDS still tracks closely with the IEA’s 450 Scenario of 2016, and exceeds that of the IEA’s 2017 Faster Transition Scenario, which the IEA said gave a 66 percent chance of limiting warming to 2°C.

Figure 1: IEA Climate Scenarios over Time, CO₂ from Energy



Sources: IEA, Oil Change International analysis

“[The SDS] remains inconsistent with 1.5°C and several aspects of the Paris Agreement and doesn’t present a scientifically consistent narrative.”¹²

- IPCC lead author Joeri Rogelj

In fact, the SDS has a 20-year ambition gap. The IPCC’s landmark 2018 *Special Report on Global Warming of 1.5°C* finds that we need to reach net-zero carbon emissions globally by 2050 to have a reasonable chance at limiting warming to that level.¹³ In contrast, the 2019 SDS, just like the 2018 SDS, does not reach net-zero carbon emissions from energy until 2070.

The extension of the SDS from 2040 to 2050 is a good step towards data transparency. However, an additional decade of data is not sufficient in the context of inadequate ambition. Moreover, the 2050 data is included in only one table in the report, and not available in the detail needed.

1.5°C scenario sketch insufficient

The IEA does provide a sketch of a pathway towards 1.5°C, however this brief exploration is contained to roughly 7 out of more than 600 total pages of analysis. If this were a new full scenario, including data tables, it would be a significant addition. But a sketch is not a scenario equipped to steer investment decisions. The information is not very detailed and is absent from the WEO’s data tables, a

key resource used by governments and investors. The IEA puts more emphasis on how “difficult and expensive”¹⁴ this pathway would be, rather than on the human and economic benefits of avoiding significantly worse climate impacts.

NEGATIVE EMISSIONS TECHNOLOGIES

The ambition of the SDS is predicated on unrealistic deployment of negative emissions technologies that the agency itself has warned against.

Unproven technologies

In its *Special Report on 1.5°C* in 2018, the IPCC warned that carbon-dioxide removal “deployed at scale is unproven and reliance on such technology is a major risk in the ability to limit warming to 1.5°C.”¹⁵

In the 2016 WEO, the IEA appeared to recognise this, warning of the climate gamble inherent in NETs reliance: “This would imply relying, at scale, on yet unproven technology. It would also exacerbate the likelihood of adverse physical impacts arising from climate change (which generally occur in a non-linear fashion at progressively higher

temperature rises).” In the 2019 WEO, the IEA admits “there are reasons to limit reliance on early-stage technologies for which future rates of deployment are highly uncertain,” but appears to ignore its own advice.

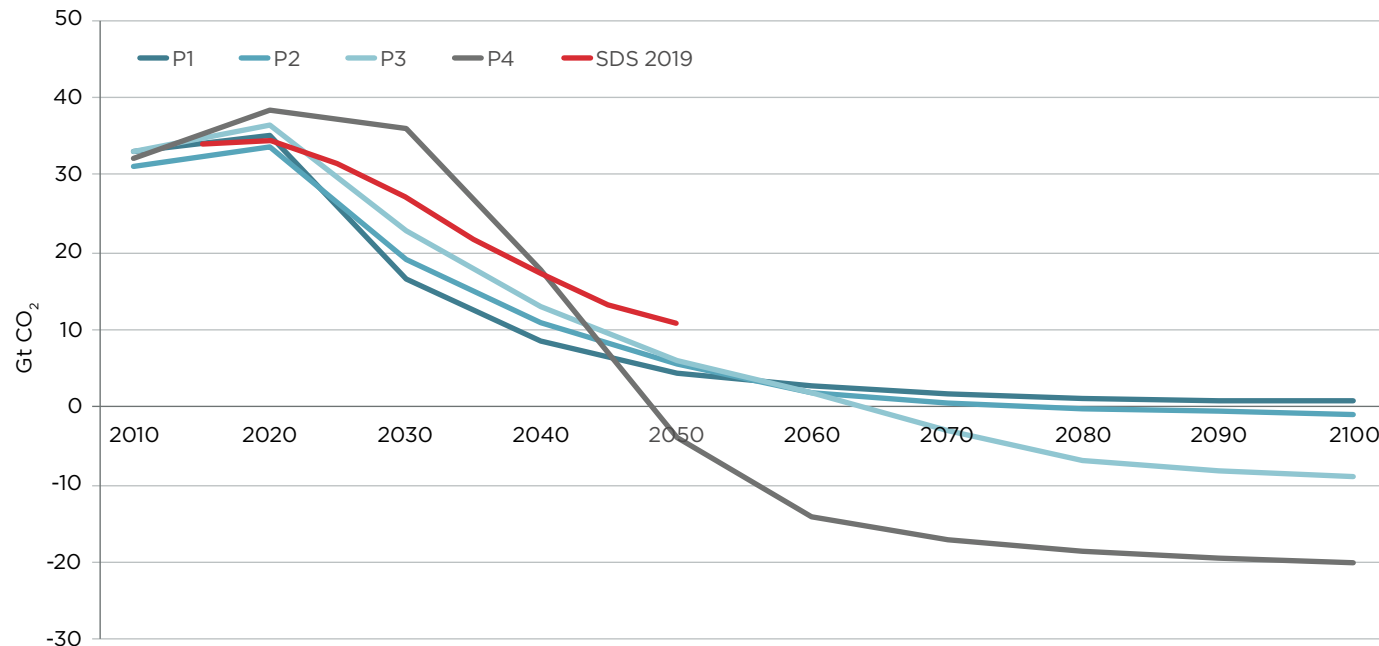
The only way the IEA can claim the SDS is fully Paris-aligned is through reliance on massive levels of negative emissions in the latter half of the century – beyond the model’s own timeline.¹⁶ Rather than develop a scenario that would provide a reasonable likelihood of limiting warming to 1.5°C, the IEA asserts that the SDS could be rerouted towards that trajectory with deployment of NETs.¹⁷

Unsustainable development

The IPCC 1.5°C report also cautions that certain scenarios may depend on levels of NETs that are not technically feasible or socially or ecologically sustainable. It includes four illustrative pathways that show different levels of reliance on NETs and discusses the implications for sustainable development: two with low NETs (P1, P2), one with high NETs (P3), and one with very high NETs and a high overshoot of the 1.5°C threshold (P4).

By 2050, the SDS’s emissions are higher than all four pathways, as shown in the figure below.

Figure 2: CO₂ Emissions, Energy and Industrial Process, in the SDS vs. IPCC 1.5°C Illustrative Pathways



Sources: IEA, IPCC/IAMC 1.5°C Scenario Explorer and Data hosted by IIASA (Release 1.1), OCI analysis

Net versus gross deployment of NETs

The IEA states that the SDS could give a 50 percent chance at stabilising temperatures at 1.5°C, with a “level of net negative emissions significantly smaller than that used in most scenarios assessed by the IPCC.”¹⁸ The term “net negative emissions” refers to the balance between the carbon still being emitted into the atmosphere versus the amount being removed. The IEA’s references to net negative emissions are misleading because it is the total (gross) amount of carbon being removed, both annually and cumulatively, that matters for the technical feasibility of NETs and consequences to land use, biodiversity, and food security.

A study by Smith et al. (2015) estimated that trapping 12 Gt of CO₂ through bioenergy with carbon capture and storage (BECCS) in 2100 would require using 25 to 46 percent of the world’s arable plus permanent cropland.¹⁹ The IEA’s sketch of a post-2050 trajectory for the SDS, if it were to return temperatures to 1.5°C, involves sequestering more than that in 2100 – a net of 15 Gt of CO₂ (the total amount could be higher).

Even though the emissions of the SDS surpass those of other high-NETs pathways, the IEA uses misleading scenario comparisons to make it appear as if the SDS is more ambitious and more

precautionary than it is. In reality, IEA ignores the temperature overshoot and sustainability risks associated with large-scale NETs deployment, risks emphasized by the IPCC.

FOSSIL GAS DEVELOPMENT

WEO 2019 continues to project fossil gas development that is incompatible with safer climate pathways.

According to OCI analysis, fossil fuel demand in the SDS scenario will likely exhaust the 1.5°C budget in the early 2030s.²⁰ One reason why the IEA’s climate scenario exhausts the carbon budget so quickly is that it models an increase in the demand for fossil gas. In the SDS, gas is the only fossil fuel that would increase to 2030. The SDS projects that, relative to 2018 levels, CO₂ emissions from coal fall by 44 percent and oil by 18 percent in 2030, whereas CO₂ emissions from gas increase by nearly 5 percent in 2030.²¹

The SDS trajectory for gas expansion is far out of step with the steady, immediate decline in demand for gas in the IPCC’s illustrative pathways to 1.5°C that assume more precautionary levels of NETs (Figure 3). The IEA is making an implicit trade off: gas expansion over the next several decades requires future generations to pay for the carbon clean-up, or risks climate breakdown if carbon-removing

technologies cannot be deployed or fail to work at scale.

FOSSIL FUEL INVESTMENT

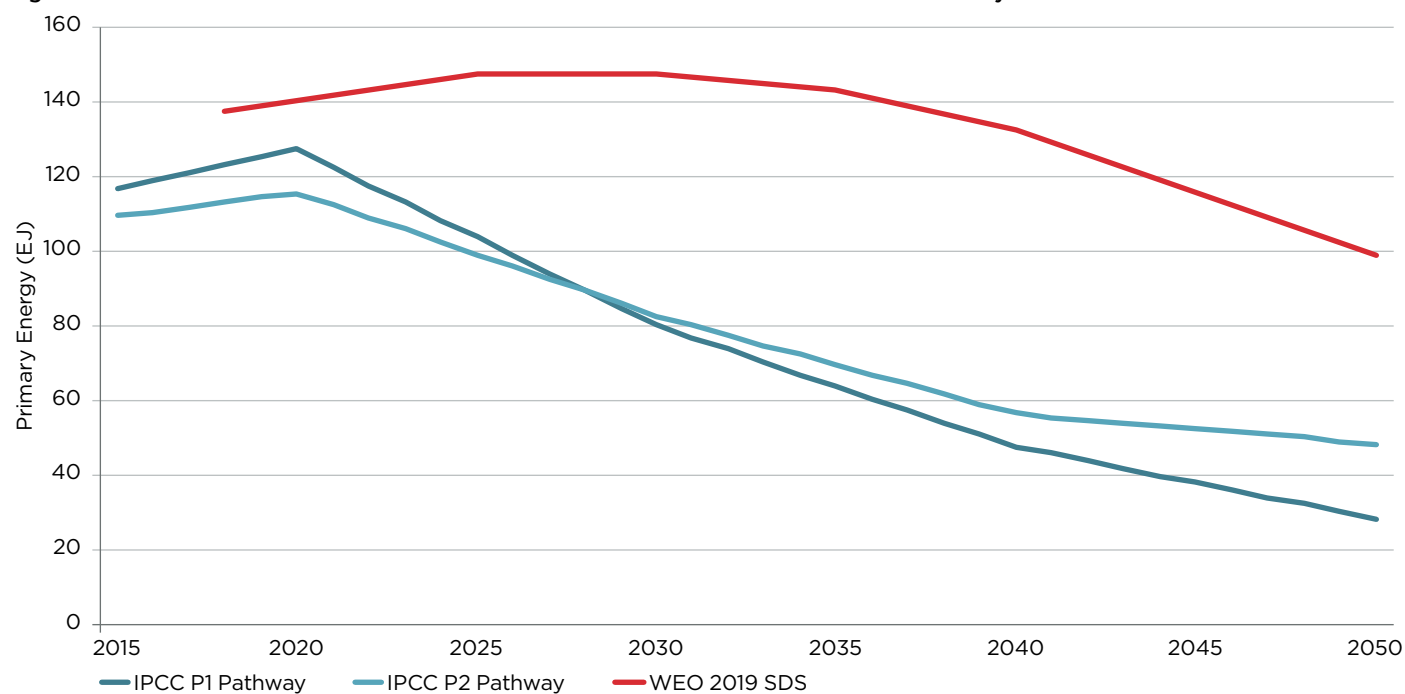
The IEA projects investment in fossil fuel production, including in the SDS, that is dangerously out of step with climate limits and risks significant stranded assets.

The IEA continues to focus the attention of governments and investors on a path we cannot afford to take by retaining its emphasis on the 3°C Stated Policies Scenario. This path includes cumulative fossil fuel investment of USD 22.8 trillion through 2040.

Even in its SDS model, the IEA indicates the need for “continued investment in both new and existing oil fields” as a “necessary part of the energy transition.” By charting declines in fossil fuels that are too slow for the full ambition of the Paris Agreement, the IEA leaves space for at least USD 11 trillion in cumulative upstream oil and gas investment under the SDS from 2021 to 2050, including more than USD 5 trillion developing new oil and gas fields.

Biról himself stated in 2018: “we have no room to build anything that emits CO₂ emissions.”²² This stands in stark contrast with the pathways set out in both the SDS and the STEPS.

Figure 3: Global Gas Demand in the WEO 2019 SDS vs IPCC 1.5°C P1 and P2 Illustrative Pathways



Sources: IEA, IPCC/IAMC 1.5°C Scenario Explorer and Data hosted by IIASA (Release 1.1)

CONCLUSIONS AND RECOMMENDATIONS

We have just under a decade left to fundamentally transform our energy system to align with climate safety. The 2019 WEO does not include the critical substantive changes needed to match the full ambition of the Paris Agreement. The narrative and analysis continue to focus on a business-as-usual pathway leading to 2.7-3.2°C of global warming, rather than centering one that gives the world a realistic chance of limiting warming to 1.5°C. This renders the IEA's attempts to position itself as a climate leader disingenuous at best.

Dr. Birol's 'grand coalition' initiative, with fossil fuel companies at its centre, ignores the fact that this industry has done everything in its power to block, slow, and distract from meaningful climate action. This is a sector that, according to the IEA's own analysis, still spends more than 99 percent of its capital expenditure on fossil fuel expansion rather than investing in renewables, in spite of rhetoric suggesting otherwise.²³

The IEA itself has suggested what the fossil fuel sector would look like in a world truly aligned with 1.5°C with a precautionary approach to negative

emissions technologies: "oil demand would fall sharply through to 2050, following a trajectory closer to the decline in supply from fields already producing today."²⁴ In other words, in a 1.5°C world, oil expansion would be halted immediately.

In this context, Dr. Birol's calls for a clean and green fiscal stimulus in response to COVID-19, while welcome, must be scrutinised. His recommendations contain problematic elements, such as calling for significant investment in carbon capture and storage technologies that are unproven at scale, while failing to propose measures that would be needed for a just transition.

This moment is an opportunity for the IEA to demonstrate true leadership on climate change, but this must be backed up by substantive action. Critically, it needs to develop and prioritize robust scenarios that show decision-makers how to meet the monumental challenge before us, and achieve the full ambition of global climate goals. If the IEA cannot do this, it cannot be considered fit for purpose as an adviser on international energy. Anybody using WEO scenarios to make energy decisions risks investing in climate catastrophe.

The IEA must urgently:

- 1. Align the Sustainable Development Scenario with the Paris goal of limiting warming to 1.5°C and adopt a precautionary approach to the use of negative emissions technologies.**
- 2. Align IEA communications and policy recommendations on fossil fuel production and consumption with the implications of a fully Paris-aligned scenario (with a precautionary approach to negative emissions).**
- 3. Focus the WEO on a strengthened version of the Sustainable Development Scenario, instead of the business-as-usual path (Stated Policies Scenario) which ensures climate collapse.**



ENDNOTES

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- 16 Of the four illustrative pathways that the IPCC features in its 1.5°C Special Report, the SDS still tracks between and, by 2050, even above the two pathways that depend on large-scale deployment of negative emissions technologies like bioenergy with carbon capture and storage (BECCS) to limit temperature rise. The levels of BECCS sequestration assumed in the P3 pathway in 2100 could consume 25 to 46 percent of the world's arable plus permanent cropland. See IPCC, SR15, 2018.
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Oil Change International is a research, communications, and advocacy organization focused on exposing the true costs of fossil fuels and facilitating the ongoing transition to clean energy.

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