Restoring the International Energy Agency's Energy Security Mission:

IEA Has Forgotten Why It Was Established

MINORITY STAFF REPORT

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Summary

In 1974, the United States and other large oil-consuming countries established the International Energy Agency (IEA) as a response to the Arab Oil Embargo. Its purpose was to ensure the security of oil supplies. Central to that original mission is the development of unbiased, policy-neutral energy market analysis and projections, including its influential annual *World Energy Outlook*.

Since 2020, however, IEA's leadership has placed greater emphasis on achieving "net zero" international climate goals. This new focus on an unachievable global energy transformation, urged by environmental groups and other non-governmental organizations, has caused IEA to veer away sharply from its energy security mission.

Nowhere is this more apparent than in IEA's short-sighted decision to abandon its Current Policies Scenario—essentially a "business as usual" reference case. In its place, IEA substituted a Stated Policies Scenario. This scenario is a hypothetical outlook based on unimplemented policies and grounded in unrealistically optimistic assumptions about the pace and scale of the transformation, especially concerning the adoption of electric vehicles by consumers.

The introduction of biased assumptions in IEA's ostensible "baseline" *World Energy Outlook* projections was tailor-made to discourage investment in oil and natural gas while promoting decarbonization targets few believe will happen. The IEA's Executive Director, Fatih Birol, even has speculated in the press that "there will not be a need for new investments in oil and gas fields." He has made similar statements on other occasions, most notably, "Looking at the world today or tomorrow, no one can convince me that oil and gas represent safe or secure energy choices for countries and consumers worldwide."

This approach is gambling with the world's energy security. If IEA members act on this advice, future global oil, natural gas, and coal production will be insufficient and concentrated in adversarial countries. These include Russia, Iran, Venezuela, and China that have little regard for international security and environmental norms. That IEA would countenance such an outcome indicates how far and how fast it is has swerved away from its core mission.

IEA's new Stated Policies Scenario—STEPS—baseline also suggests that both world oil and natural gas demand would peak before 2030, something no other "business as usual" scenario from other credible modelers, including the U.S.

Energy Information Administration, suggests. IEA's peak oil and natural gas demand forecast is now broadly and uncritically accepted in the news media.

In February of 2024, the Biden administration exploited IEA's biased *World Energy Outlook* projections of peak natural gas demand before 2030 to justify its decision to "pause" the permitting process for liquefied natural gas exports. In doing so, the administration ignored projections produced by its own Energy Information Administration showing robust global natural gas demand growth through 2050.

IEA's Net Zero Emissions scenario is another example of the agency's push to end investments in new hydrocarbon production. There is no serious case to be made for achieving net zero emissions by 2050. It is, and always has been, quite simply out of reach. What is even worse is that IEA intentionally ignores the enormous costs involved by assuming the same level of economic growth across *all* of its modeling scenarios. It also ignores the fact that a Net Zero Emissions scenario would concentrate oil and gas production in the very group of countries that prompted the U.S. and others to establish IEA in 1974.

IEA should instead use the resources it currently devotes to the Net Zero Emissions scenario, to understand the energy security implications of the "energy transition" that IEA is abetting. IEA has done some useful work on the concentration of critical mineral supply chains. It should create credible scenarios that explore the energy security implications posed by the continued dominance of critical minerals and nuclear fuel supply chains by China and Russia, respectively.

IEA's work should strengthen the energy security of the United States and its other members—not weaken it. During the upcoming 119th Congress, the Senate must insist on reforms at IEA. IEA should once again produce for its *World Energy Outlook* a real unbiased, policy-neutral "business as usual" reference case of the kind the Energy Information Administration produces. It also must make it loud and clear that it does not endorse ending investments in oil, natural gas, and coal. IEA also should make all of its data and methodologies, which are paid for by taxpayers, freely available.

The United States' representative to the IEA Governing Board is at the assistant secretary level at the Department of Energy. During the confirmation process for nominees to the Department of Energy, the Senate must ensure that the United States is a strong advocate for restoring IEA's focus on its energy security mission.

French President Macron's observation that IEA has become the "armed wing for implementing the Paris Agreement" is regrettably true. With the many serious energy security challenges facing the world, however, IEA should not be a partisan cheerleader. What the world needs from IEA—and what it is not receiving now—is sober and unbiased analyses and projections that educate and inform policymakers and investors. IEA needs to remember why it was established and return to its energy security mission.

Introduction

The “Arab Oil Embargo” was a wake-up call to the United States and other large oil-consuming nations. The Organization of Arab Petroleum Exporting Countries (OAPEC) initiated the embargo on exports of crude oil to the U.S., beginning in October 1973. It was a response to President Nixon’s request that Congress provide $2.2 billion in aid to Israel during the Yom Kippur War.

Production cuts accompanied the embargo, but more importantly OAPEC’s decision to increase the posted price for crude oil sent the world price soaring. From about $2.90 a barrel just before the embargo, the price of crude oil jumped to $11.65 by the beginning of 1974.

In the wake of the embargo, large oil-consuming countries, led by the United States, established the International Energy Agency (IEA) in 1974.[1] IEA is an autonomous intergovernmental organization under the umbrella of the Organization for Economic Co-operation and Development (OECD). It is now led by Executive Director Birol, who has been in this position since 2015. In 2022, Mr. Birol was appointed for an unprecedented third four-year term.

The agency’s primary goal—indeed, its founding rationale—was to ensure the security of oil supplies and to create a coordination mechanism whereby consuming countries can address vulnerabilities in oil supply and respond effectively to supply disruptions to prevent price shocks. Until fairly recently, IEA played its energy security role well.

IEA also provides global energy forecasts as part of its mission. Its forecasts are not just technical documents with limited reach. They carry tremendous influence on the world’s collective perception of future energy trends. In doing so, they exercise enormous influence on energy policy, the investment decisions of public, publicly-traded, and privately-held companies and associated financing from public and private entities alike.

Consequently, it is imperative that IEA conduct its mission in a dispassionate, objective manner. It has become clear, however, that over the past five years IEA is failing to fulfill these responsibilities. By its own admission, IEA has placed greater emphasis on “build[ing] net-zero emission energy systems to comply with internationally agreed climate goals.”[2] This new focus, which was endorsed by a vote of IEA’s Governing Board, has enabled IEA to move away from objectively informing and educating policymakers to promoting an agenda often at odds with its energy security mission.

In 2022, IEA member governments further expanded IEA's mandate to assist countries in building "net-zero emission energy systems." IEA's Ministerial Meeting 2025 approved a new strategy proposed by Executive Director Birol to engage with major emerging economies and provide a greater focus on alternate energy technologies and energy efficiency.

IEA's retreat from its security mission and its politicization of forecasts has attracted strong opposition among energy experts, including experts who are not involved in the production or sale of oil and natural gas. However, when the Biden administration ignored its own Energy Information Administration's (EIA) forecasts and justified its liquefied natural gas (LNG) exports pause entirely on IEA's flawed forecasts, it gave the game away.

In March 2024, Senator John Barrasso, M.D., Ranking Member of the Senate Committee on Energy and Natural Resources, and Representative Cathy McMorris Rodgers, Chair of the House Committee on Energy and Commerce, sent a letter to Executive Director Birol outlining their concerns.[3] IEA's response to that letter did nothing to allay the concerns it expressed about the direction IEA has been taking.

Especially concerning are the biases that have crept into its *World Energy Outlook* (WEO), the most influential publication of the agency. Specifically, IEA appears to be censoring and tailoring its oil and natural gas demand forecasts to fit a "peak demand" narrative with the goal of discouraging investment in these sectors. The flaws, identified by Senator Barrasso and Representative McMorris Rodgers in the letter, have harmed IEA's reputation for impartiality.

This report takes a closer look at the issues raised in that letter and others. It also makes a series of recommendations on how IEA can address these issues. It is intended to serve as a starting point for discussion about the future of IEA, and the future of U.S. participation in it, in the 119th Congress.

With all of the challenges facing the world's energy markets, a strong, data-driven IEA still has an important role. As this report argues, to play that role, it must return its focus to its energy security mission.

Background

From the original 16 members, IEA today boasts 31 member countries.[4] An additional five OECD countries are seeking access to full IEA membership.[5] There are also 13 associate countries, including China and India.[6]

The decision-making body of IEA is its Governing Board, which is composed of representatives from the energy ministries of each IEA member country. The Board oversees and approves all of IEA's administrative and directional matters, including the biannual program of work and budget. The program of work is approved by a "qualified majority vote," which allocates voting weights to each member country. However, some decisions, such as appointing the Executive Director, require unanimity. IEA also adopts a "ministerial communiqué" at its biannual meeting, which is a statement of the group's positioning and agenda for the next two years.

Traditionally, the role of Executive Director is filled by a European official (though with some exceptions) as the titular head of the organization. The Deputy Executive Director is a U.S. official responsible for leading the work of the agency. A Japanese official typically oversees the emergency preparedness portfolio. The U.S. representative to IEA's governing board also plays an important role in setting the direction of IEA, and this position recently has been filled by an Assistant Secretary from the Department of Energy.

IEA has several standing groups and committees covering technical matters. These are made up of government officials from member countries. Current groups and committees include:

- The Standing Group on Emergency Questions, which is responsible for all aspects of oil emergency preparedness and collective response to supply disruptions;
- The Standing Group on the Oil Market, which monitors and analyzes short- and medium-term developments in the international oil market;
- The Standing Group on Long-Term Co-operation, which encourages cooperation among IEA member countries to ensure collective energy security, improve economic efficiency of their energy sector and promote environmental protection in provision of energy services;
- The Standing Group for Global Energy Dialogue, which is responsible for work with countries and regions outside of the IEA membership, including China and India;
- The Committee on Budget and Expenditure, which advises the Governing Board on resource management, budget, and administration; and

- The Committee on Energy Research and Technology, which coordinates and promotes the development, demonstration and deployment of alternative technologies.

Members fund IEA primarily through proportional dues established by the Governing Board.[7] IEA currently operates with a regular budget of €30.6 million (approximately $33.2 million). Since 2021, the United States has provided on average 23 percent of IEA's regular budget and 14 percent of its total budget (including voluntary contributions).

IEA operations also are financed through voluntary contributions from "countries and other energy stakeholders."[8] In 2017, about a third of IEA's budget was financed by voluntary contributions, most of which came from governments.[9] It plans to increase the share of voluntary contributions in its budget, which suggests IEA plans to accept an increasing amount of dedicated project-specific or earmarked funding. IEA also receives funding from private institutions and in-kind contributions, such as loaned staff.

In 2022, IEA adopted a ministerial communiqué that committed the agency to evaluating the increased use of voluntary contributions and emphasized the necessity of member-driven oversight. In 2024, IEA adopted a ministerial communiqué that further acknowledged the "positive trend of increasing voluntary contributions" and requested IEA to "explore options to implement a new category of voluntary contributions for institutional support."[10]

IEA Loses Its Way

For 50 years, IEA's energy security activities focused on four general areas:

1. Improving cooperation among member countries to reduce excessive dependence on oil through energy conservation, development of alternative energy sources, and energy research and development;
2. Providing information on international oil markets as well as consultation with oil companies;
3. Working with oil producing and consuming countries to help develop a stable international energy trade as well as rationalizing the management and use of energy resources; and
4. Developing plans to help member countries manage the risks of a major oil supply disruption.

Energy consultant and keen IEA observer and critic, Robert McNally, speaks for many when he noted recently, "For most of the past five decades, the IEA fulfilled its watchdog duties. It became the gold standard for timely data,

impartial analysis and forecasts devoid of political bias. The agency navigated energy crises, providing data and policy coordination during the two Gulf Wars, the 2019 Iranian attack on Saudi Arabia's Abqaiq oil facility, and various natural disasters affecting energy supply and basic energy trends."[11]

To this favorable assessment of IEA's history, Mr. McNally adds this troubling qualification: "Unfortunately, in recent years, the IEA has succumbed to politicization and strayed from its security mission."

IEA's focus has drifted from energy security and related information-centric efforts to include a broader range of energy issues and policies, especially decarbonizing energy systems to address climate change. Executive Director Birol has driven much of this change of emphasis. Shortly after his appointment in 2015, he proposed to the IEA's Governing Board a modernization strategy that looked beyond oil security, offered an "open door" policy to emerging economies like China and India, and focused more heavily on "clean" energy technology.

These efforts bore fruit. At the end of IEA's 2022 biannual ministerial meeting, the members issued a communiqué stating, "We welcome that COP26 and the Glasgow Climate Pact brings the world closer to achieving the goals of the Paris Agreement, and also acknowledge that stabilization at 1.5 degrees Celsius is difficult but still within reach."[12]

The 2022 communiqué went further still: "We view this Ministerial as the launch of a new phase of the Agency to address today's energy and energy-related needs in a climate-constrained world . . . IEA has *a new guiding principle*: supporting countries in the global effort to attain net zero greenhouse gas emissions in the energy sector by mid-century" (emphasis added).

IEA's 2024 communiqué reaffirmed this principle, launching what it called "IEA 3.0." It said, "[W]e underline the commitment on transitioning away from fossil fuels in energy systems. We intend to mobilise and diversify additional necessary investment in the energy sector, and to achieve a fully or predominantly decarbonised electricity sector by 2035, in line with the Paris Agreement and to keep the 1.5-degree goal within reach."[13]

The 2024 communiqué also promised that IEA would, "support efforts to make financial flows for the energy sector consistent with the financial commitments and goals under the Paris Agreement."**[14]** It added that IEA would, "aim to explore solutions that can help mobilise financial flows and *guide investment from fossil fuels to clean energy alternatives*, in liaison with other international fora" (emphasis added).**[15]** IEA has followed through on this with a vengeance.

As this report demonstrates, the shift in mission and focus at IEA under Executive Director Birol jeopardizes global and U.S. energy security at a time when it is under threat from Russia, Iran, China, Venezuela, and other bad actors. And this shift comes at a time when, as this report outlines, the facts show there has been no diminution of the critical economic and geopolitical role for oil and natural gas in world markets.

Speaking at the 2024 IEA ministerial, French President Emmanuel Macron observed that, "We are very proud that since its creation, the Agency has been able to profoundly shift its mandate. From an agency dedicated to managing strategic oil reserves, it has now become a global hub for debate, collective action to meet the challenge of the energy transition. The IEA has become, so to speak, our armed wing for implementing the Paris Agreement."[16]

The changes that have occurred at IEA have damaged, perhaps irreparably, the Agency's reputation for impartiality. The press and policymakers routinely draw the conclusion from IEA products that IEA recommends that investment in new oil and natural gas projects must stop immediately—a deeply misguided and troubling position for an organization founded to address security challenges in oil markets. In October 2023, Executive Director Birol told the *Financial Times* that, "Looking at the world today or tomorrow, no one can convince me that oil and gas represent safe or secure energy choices for countries and consumers worldwide."[17]

IEA's Flagship WEO Lists to Port

IEA's changing mission could not help but influence the organization's approach to one of its signature endeavors—the *World Energy Outlook*.

Since 1988, IEA has been providing global energy projections under different scenarios. IEA's WEO document itself cautions that its scenarios are neither "forecasts" nor "projections" (though both terms are synonyms for "outlooks"). As a practical matter, however, these scenarios are treated explicitly as "forecasts" by governments and the news media. IEA itself refers to WEO as "the energy world's most authoritative source of analysis and *projections*" (emphasis added).[18] This report, therefore, will adopt the term "projection."[19]

IEA's WEO projections have a tremendous influence in shaping how the world sees future energy trends, which in turn has significant consequences for government policies and public and private investment decisions. IEA must be objective and dispassionate. It is clear, however, that IEA is failing to fulfill these responsibilities.

Climate change is an extraordinarily complex issue deserving IEA's attention. Excessive focus on an "energy transition," however, has led IEA to veer away from objectively informing and educating policymakers about economic and security consequences, and towards promoting an agenda with little regard for its implications. Instead of providing policymakers with balanced assessments of energy outcomes that arise from climate proposals, IEA—especially its WEO—has become an energy transition cheerleader.

Nowhere is this more apparent than in IEA's short-sighted decision to abandon its core Current Policies Scenario (CPS)—essentially a "business as usual" reference scenario—and replace it with the Stated Policies Scenario (STEPS). The CPS, which IEA ran from 2010 to 2019, represented a baseline in which only policies already formally adopted and implemented are modeled (Figure 1). STEPS assumes additional but unspecified policies are undertaken to achieve policy targets, no matter how realistic or aspirational those targets may be.

In conjunction with CPS, IEA also ran a New Policies Scenario (NPS) within its WEO from 2010 to 2019. This scenario assumed the implementation of new measures consistent with broad policy commitments announced by governments. In 2020, both CPS and NPS were summarily discontinued in favor of STEPS, which became for all intents and purposes IEA's de facto reference case, or baseline, scenario. Similar to NPS, STEPS reflects announced policy intentions and targets, though it does not assume that governments will reach most, never mind all, of these announced goals. In 2021, IEA introduced the Announced Pledges Scenario (APS). APS goes further than STEPS in that it assumes implementation of all of the climate commitments and aspirational pronouncements (not necessarily policies) made by governments around the world, including their Nationally Determined Contributions (NDCs) made under the Paris Agreement and their longer term "net zero" targets.

Over the years, IEA also has modeled three extremely ambitious decarbonization scenarios. First was the 450 Scenario, which targeted achieving an atmospheric carbon dioxide concentration of 450 parts per million. This was followed by the Sustainable Development Scenario, which assumed action consistent with the goals of the Paris Agreement and the United Nations' Sustainable Development agenda. Next came the Net Zero Emissions Scenario (NZE), which represents a pathway to get to "net zero" emissions from the global energy mix by 2050.

The Case for a Reference Case

The importance of maintaining a true baseline reference case cannot be overstated. A CPS is necessary for evaluating the costs and benefits of energy and climate policies. Such comparisons simply cannot be done otherwise.

Very early on (in WEO 2000), IEA noted, "The Reference Scenario does not include possible, potential or even likely future policy initiatives. Major new energy-policy initiatives will inevitably be implemented during the projection period." It also noted that its Reference Scenario takes the same approach used by EIA, assuming that, "current policies will be continued."[20]

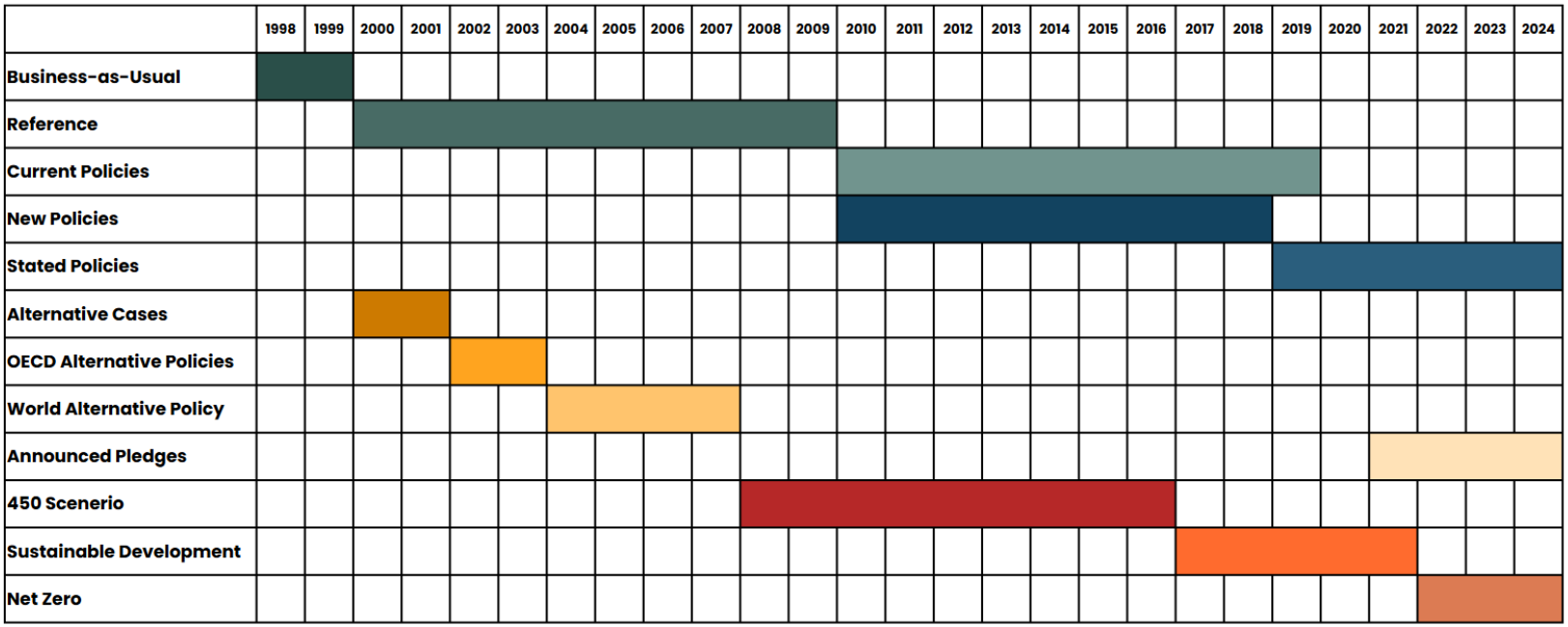
Like IEA, EIA was formed in response to the Arab Oil Embargo. The U.S. Congress established EIA as an independent agency in the Department of Energy Organization Act of 1977.

Thus far, EIA has operated free from political influence because rules are in place to ensure that remains the case. EIA is one of a number of Principal Statistical Agencies of the U.S. government. These agencies adhere to professional standards and practices that safeguard the quality, integrity, and credibility of their data and ensure they are free of political influence and policy bias. As EIA points out: "Our nation relies on the flow of objective, credible statistics to support the decisions of governments, businesses, households, and other organizations. Any loss of trust in the integrity of the federal statistical system and its products can foster uncertainty about the validity of measures our nation uses to monitor and assess performance and progress."[21]

EIA's adherence to a policy-neutral reference case frees it to run alternate scenarios that assess the potential impacts of different policies, economic growth rates, energy prices, technology prices, technology development, oil and natural gas recovery, and other changes that can then be compared to the reference scenario. Therefore, EIA does not have to make the type of policy assumptions in its reference case that IEA is forced to make—or rather chooses to make—in STEPS, which makes STEPS less valuable as a baseline.

Including policies that have not been implemented in a reference case or baseline essentially means the costs and benefits of those policies become "zero." IEA formerly acknowledged this fact. Its WEO 2007, for example, says, "This [CPS] scenario is intended to provide a baseline vision of how global energy markets are likely to evolve if governments do nothing more to affect

Figure 1. Changes in International Energy Agency World Energy Outlook Scenarios



underlying trends in energy demand and supply, thereby allowing us to test alternative assumptions about future government policies."[22]

Further, IEA's WEO 2020—the first one that substituted STEPS for CPS—states, "We would *warn against taking the STEPS as a baseline or reference case*. Achieving stated policies should not be taken for granted, especially in countries and sectors where they are ambitious and far reaching" (emphasis added).[23] Whatever one's views of the decision to jettison a reference scenario, this is at least an accurate depiction of STEPS and its obvious shortcomings.

That was then. Earlier this year, IEA's Director of Sustainability, Technology and Outlooks, Laura Cozzi, stated that "*STEPS for us is the baseline*. What we do is to reflect what is in the law and in the pipeline, and what is the delivery mechanism that each government has in place, and what it can deliver" (emphasis added).[24]

IEA's WEO 2024 states correctly that STEPS "is not a normative scenario," meaning it does not set a target or other desired outcome and assume that the target or outcome will be met.[25] IEA is on less solid ground, however, when it says that STEPS, "does not assume an inevitable shift over time towards stronger action on emissions reductions."[26] IEA is quite clear throughout WEO 2024 that STEPS provides a "direction of travel" in energy.[27] It notes, for example, that, "Targets included in the APS still can inform trends in the STEPS. Even if those targets are not achieved in full or on time in the STEPS, *they establish a clear direction of travel that does influence the overall policy landscape, private sector decision making, and more*" (emphasis added).[28]

This is completely at odds with IEA's claim that STEPS does not "assume an inevitable shift."[29] Of even greater concern, it demonstrates IEA's desire, through its WEO, to influence public and private investment decisions in energy. This is a significant departure from more than a decade of sound IEA practice.

IEA is careful to say its WEO scenarios are not forecasts or predictions. Yet what IEA now advertises as its "baseline" rests in large part on *predictions* of whether (and to what extent) countries will implement policies they have stated but have not enacted either through legislation or a regulatory process. Modeling current policies is difficult enough without piling on uncertainties surrounding what governments may do to address climate change.

IEA's decision to insert announced-but-not-implemented policies in its STEPS "baseline" does a disservice to policymakers who must make decisions on sound data. For example, reducing carbon dioxide emissions from energy is the result of two factors: (1) reducing current emissions, and (2) avoiding potentially significant future emissions that could be expected with no new

policies. By putting suggested policies in the baseline, as STEPS does, there is no way of knowing the quantity of emissions that need to be avoided and how difficult it will be to avoid them, something a true reference case would provide. Hiding avoided emissions in a baseline obscures the reality of the volume, trajectory, and costs of emissions reductions. Emission reductions and avoidances cannot just be assumed away.[30]

We have seen examples of assuming too much in the baseline here in the United States. In 2014, the Environmental Protection Agency (EPA) proposed its Clean Power Plan (CPP), which was finalized in 2015. EPA's CPP modeling played fast and loose with its "baselines" to advance its regulatory agenda and claim CPP would cost next to nothing. As a Global Energy Institute analysis noted, "EPA conveniently pushed a lot of the expensive stuff into its revised Base Case model run, which means these costs are not attributable to CPP." In contrast, EIA ran a non-CPP Reference Case scenario and a CPP scenario. A comparison of these demonstrated the large costs of EPA's CPP proposal.[31]

EPA did something similar with its recently-proposed rule to reduce carbon dioxide emissions from power plants. The Global Energy Institute explained that: "EPA's own modeling shows its power plant rule will reduce power sector carbon emissions by a grand total of about 1% in 2040. How can that be true? The answer is found in a complex web of modeling assumptions that result in massive power sector changes in the baseline scenario *before* the proposed rule's requirements are applied. . . . EPA's forecast differs significantly from that predicted by the Energy Information Administration" (emphasis added).[32]

In both instances, EPA created a supposed "business as usual" baseline most favorable to the regulations it was proposing. That is one reason EPA's forecasts are viewed as less trustworthy than EIA forecasts, and deservedly so.

Then there is the uncertainty inherent in predicting what governments, especially democratic governments that respond to the will of voters, will do in the future. IEA assures us that STEPS is based on "a detailed sector-by-sector and country-by-country review of policies around the world." It says:

> *The STEPS provides a detailed analysis of the energy policies that governments have put in place as well as those that they have announced. This includes policies dealing directly with energy production and use in different sectors, those covering environmental aspects of energy use, and energy-related industrial policies. The STEPS covers national policies, as well as many at regional and sub-national level. Broad energy and environmental objectives are not automatically assumed to be met but are reflected to the extent that they are backed up by specific announced policies and measures in the relevant parts of the energy sector.*[33]

IEA has recently argued that, "The CPS was not a policy-neutral approach as it did not include the effect of future policy actions, even where governments had announced their intention to enact them."[34] This statement is a misleading characterization of CPS. While CPS did not assume the effects of announced policies, it also did not assume the effects of announced policies would not occur. It simply took into account the in-effect policies at a given point in time.

Regarding STEPS, IEA's 2024 WEO argues further that it, "is a reasonable way to reflect the direction of travel for the energy system, based on prevailing policy settings, and technology and market trends."[35] STEPS is better understood as a reflection of IEA's alignment with its own policy preferences.

There have been, however, clear examples of how the addition of assumed future actions to current policy baselines can be used to advance a political or policy agenda. It is hard for IEA to argue that STEPS does otherwise when Executive Director Birol writes, "I urge decision makers around the world to use this analysis to understand how the energy landscape is changing, and how to accelerate this clean energy transformation."[36] That statement sounds more like policy advocacy than dispassionate analysis.

For IEA to conclude that CPS was not policy-neutral because it did not include the "effect of future policy actions, even where governments had announced their intention to enact them" is backwards. Any assumptions, even informed ones, about future actions introduce biases. The idea that governments, which are made up of partisan actors, can be counted on to provide dispassionate accounts of their intentions flies in the face of experience.

The history of climate change politics, both in domestic and international settings, is replete with examples of governments saying one thing and doing another. In 2009, for example, President Obama and allies in the House and Senate announced their intention to enact a cap and trade bill. Despite having Democrat majorities in both chambers—including a filibuster-proof Senate majority—such a measure was never enacted.

President Obama also made grandiose pledges at various meetings of the United Nations (UNFCCC) Convention on Climate Change. Specifically, he pledged that the United States would slash its net greenhouse gas emissions at least 26 percent, and aim for 28 percent, below the 2005 level by 2025. While the most recent emissions data from EPA[37] and EIA[38] show the United States achieving the largest emissions reductions of any country in the world—mostly because of market dynamics, not government policy—we still fell well short of achieving President Obama's unreasonable emissions targets.

This experience alone should give IEA pause that the STEPS "baseline" is somehow "reasonable" or "neutral."

Then there is the question of how much credence should be given to "stated" policies. STEPS, which again IEA has called its new "baseline," assumes policies with much less political or regulatory traction than EPA's CPP.

There is no doubt IEA expends considerable effort in trying to get a firm grip on what is and is not likely to happen. Trying to predict policy in the roiling political waters across the globe today is an exercise fraught with uncertainty. IEA's 2024 WEO observes, "Countries representing half of global energy demand are holding elections in 2024, and energy and climate issues have been prominent themes for voters that have been buffeted by high fuel and electricity prices."[39] Nonetheless, IEA has decided to make guesses—educated ones, but guesses nonetheless—about future policies.

By forsaking neutrality and making predictions about future government policies, IEA piles assumption on top of assumption to provide a skewed view of the world. This is not an idle concern. Governments in several high-emitting countries, including Canada, China, South Korea, Russia, South Africa, Indonesia, Mexico, the European Union, and of course the United States, have rolled back policies or revised emissions or other targets.

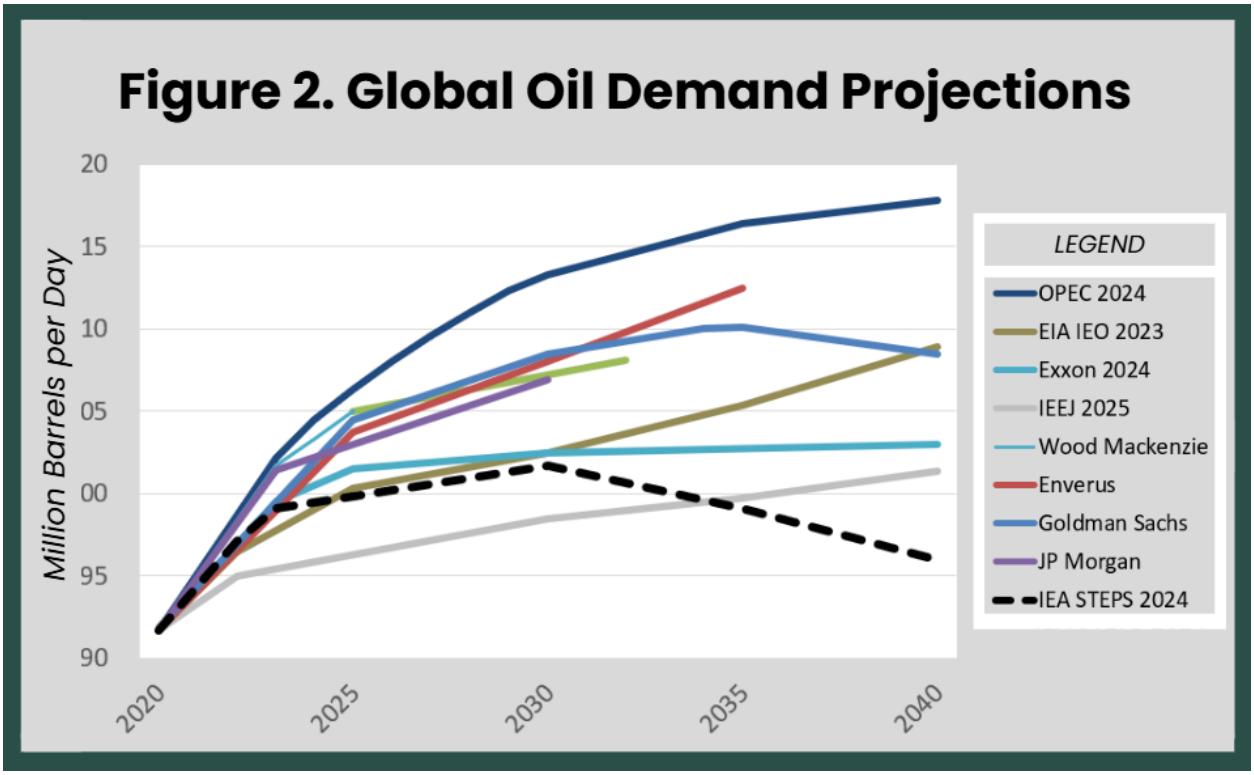
A review of the policies IEA included in its WEO 2024 STEPS also finds that many of these policies are not set in stone. While some have been enacted in law or through a regulatory process, many are policies, plans, or targets that have not been enacted and may or may not be funded or implemented.[40]

It can be argued that policy changes render a CPS projection obsolete. However, that is the role of a real policy-neutral CPS, and it is what makes a "business as usual" projection of value to policymakers. IEA's policy biases, on the other hand, create a false impression that eventually is found wanting.

Nowhere is the creation of a false impression more apparent, and potentially more damaging to energy security, than IEA's modeling of "peak" oil and natural gas demand by 2030 under STEPS. The slanting of IEA's STEPS "baseline" projections since 2020 discourages investment in oil and natural gas while endorsing decarbonization of global energy. In an October 2023 interview, Executive Director Birol claimed that with peak oil and natural gas demand coming before 2030, "even in the absence of new climate policies, investing in new oil exploration and gas could be a risky business."[41]

Peak Oil Demand?

At a high level, an analysis of IEA's historical WEO data from 2010 to 2019 reveals that the agency's CPS projections for oil and natural gas demand were fairly accurate compared to actual trajectories. CPS projections were also in general alignment with other leading industry and other forecasters, including EIA,[42] ExxonMobil,[43] Institute of Energy Economics, Japan (IEEJ),[44] and the Organization of Petroleum Exporting Countries (OPEC).[45] None of these organizations forecasted oil demand peaking before 2030. More recent model projections from these organizations can be used to provide a rough consensus about what future "business as usual" oil demand might look like, absent a CPS scenario from IEA.



IEA's STEPS—which IEA now advertises as its baseline—shows something decidedly different from these other forecasts (Figure 2). Across all forecasts, the impact of the COVID pandemic could not help but have an impact on energy demand going forward. But none of the recent projections from these other organizations show oil demand peaking before 2030. In fact, most indicate that oil demand growth continues or, at a minimum, stays flat out to 2050. IEA's "baseline" STEPS, however, based on policies that have not been put into action yet, shows oil demand declining sharply after 2030.

Investor and financial groups also have issued reference forecasts that are much more bullish about future oil demand than IEA. For example, Wood

Mackenzie predicts steady growing demand.[46] It expects demand to jump from 103 MMbbl/d in 2024 to 108 MMbbl/d in the early 2030s.

Enverus Intelligence Research also projects oil demand of about 108 MMbbl/d in 2030.[47] In particular, Enverus notes that automobile fuel economy standards rarely live up to their stated effectiveness, consumers persist in buying larger vehicles, and the enthusiasm for electric vehicles (EVs) is waning in the United States.

Goldman Sachs also does not see oil demand peaking before 2030 due to increased demand from Asian markets.[48] It sees demand peaking at 110 MMbbl/d by 2034, which could rise further to 113 MMbbl/d by 2040 if EVs are slow to catch on with consumers.[49] According to J.P. Morgan, oil demand will continue to increase through 2030 driven by rising energy consumption in developing nations.[50]

Notably, IEA's last two CPS projections, released in 2018 and 2019, line up closely with other leading forecasters. They show global oil demand of 110.5 to 111.5 MMbbl/d in 2030 and further increases to 2040. These are well within the range of forecasts cited above from Goldman Sachs, Enverus, and Wood Mackenzie.

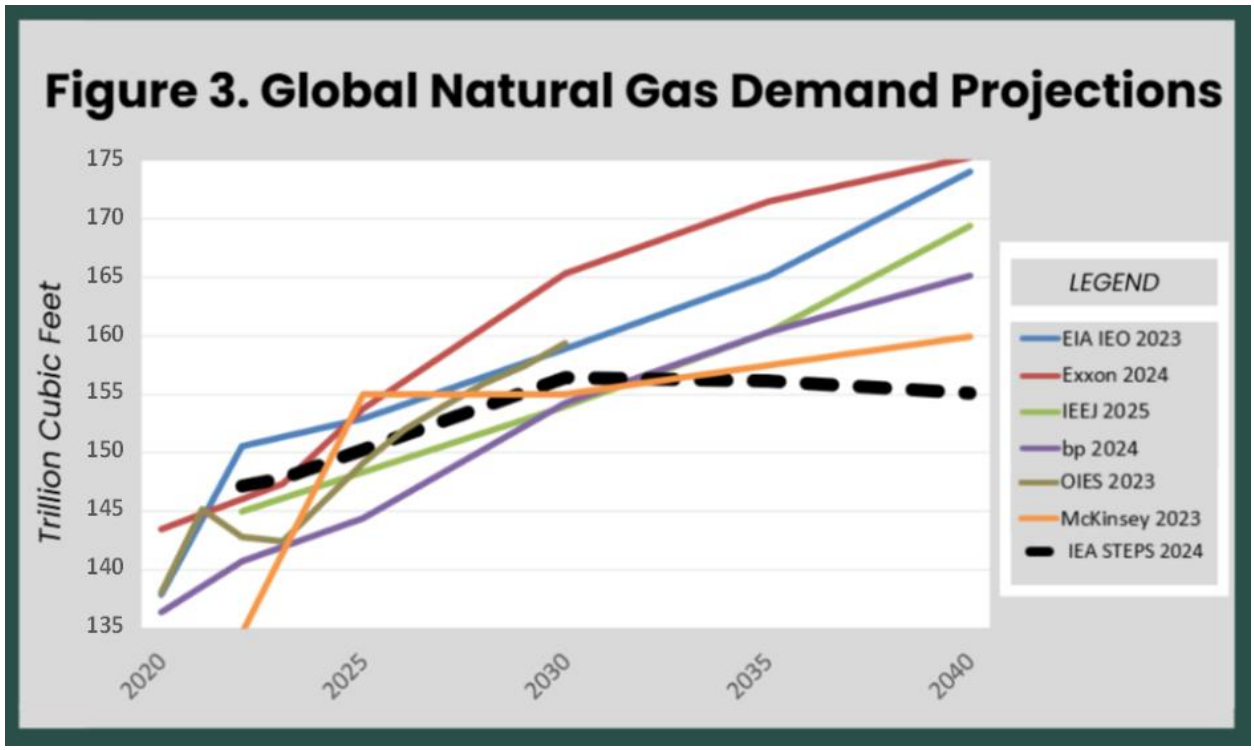
Despite projecting a rise in demand by 3.2 MMbbl/d in 2030 compared to 2023, IEA's *Oil 2024* report projects there will be a glut of oil production capacity by 2030 (which from an oil security perspective, it must be said, would be a good thing if it happened). Executive Director Birol, however, took the opportunity of the report's release to warn that "oil companies may want to make sure their business strategies and plans are prepared for the changes taking place," [51] which some saw as a veiled appeal to stop investing in oil production. Meanwhile, J.P. Morgan anticipates "that global oil markets could face a 1.1 [MMbbl/d] deficit in 2025, widening to 7.1 [MMbbl/d] in 2030."[52]

The results of the reference forecasts examined here suggest that oil demand is far more robust than IEA projects. Mr. McNally sums up IEA's "peak oil before 2030" preoccupation this way: "IEA's influential demand forecasts now reflect wishful thinking about the timing and cost of a peak in oil and gas consumption."[53] There are profound economic and geopolitical differences between a world with a 1 to 7 MMbbl/d *deficit* and a world with an oil *surplus* of the kind IEA expects within the decade.

Peak Natural Gas Demand?

The story is about the same for natural gas. Figure 3 presents natural gas demand trajectories for IEA's WEO 2024 and six other respected modeling groups, including EIA,[54] ExxonMobil,[55] IEEJ,[56] McKinsey,[57] bp,[58] and Oxford Institute for Energy Studies (OIES).[59]

Each group's reference case shows rising natural gas demand through 2030 and beyond except IEA. Its STEPS shows natural gas demand declining after 2030 while the other groups show demand growing from 6 percent to 10 percent between 2030 and 2040.[60] Even bp's STEPS-like base case projects a 7 percent increase in natural gas demand between 2030 and 2040 compared with IEA's projected decline of 1 percent.[61]



IEA's STEPS gives the wrong impression about the "direction of travel" of world natural gas demand. The general consensus is that the world will need more natural gas going forward, not less. Underinvestment in natural gas infrastructure, especially LNG terminals and ships, could be catastrophic for the world's energy security, especially if it leads to greater supplies coming from Russia or Iran.

It also may contribute to increased emissions if more natural gas is liquefied and shipped from countries, again such as Russia, with poor environmental records, or if more carbon-intensive fuels are burned instead.

Recall that IEA was established to be a source of information and a scenario modeler. For several years, IEA's WEO has not reasonably reflected the real world where natural gas demand remains healthy and is not likely to peak anytime soon. IEA's WEO 2024, for example, upped projected 2030 demand by 3 percent compared to WEO 2023, a stark reflection of a strong post-COVID recovery in natural gas demand.[62] (It is also telling that IEA had to adjust its 2030 coal demand number upward by 6 percent.)

Finally, it is worth noting the near- and medium-term oil market reports (OMRs) produced by IEA generally are more in line with market trends. These reports are different from the WEO scenarios. The OMRs have tended to reflect higher demand than the STEPS scenarios in IEA's flagship WEO.

Bias Has Consequences

All of this matters because investors and policymakers pay attention to what IEA says. That IEA appears to be using its WEO to support a particular energy agenda instead of being a neutral purveyor of data is troubling and has real-world consequences for energy security.

IEA has promoted ardently the notion of "peak" oil and natural gas demand by 2030. Environmental groups and the media have embraced IEA's message of ending investment in oil and natural gas, even if consumers have not. In reporting on the increasing investment in offshore oil and gas production, the *Financial Times* quotes one climate campaigner echoing the IEA line, saying, "these companies are betting on decades-long fossil fuel projects and pouring huge amounts of capital into a market that will start declining before the end of the decade."[63] The article notes how IEA has said meeting the Paris Agreement's goals means "no new fossil fuel exploration should be carried out."[64]

The Biden administration exploited IEA's STEPS and APS projections and other products to pursue policies that undermine international energy security. In a February 2024 hearing before the U.S. Senate Committee on Energy and Natural Resources, Deputy Secretary of Energy (and former Deputy Executive Director of IEA) David Turk justified President Biden's decision to stop the permitting process for new LNG exports by invoking IEA's WEO 2023 scenario projection. He did so while ignoring the reference scenario in the *International Energy Outlook* produced by his department's EIA.[65] Mr. Turk effectively said that he knows the needs of LNG consumers better than consumers themselves based entirely on IEA's flawed STEPS "reference scenario."

It is clear why. IEA's WEO 2023 STEPS, which showed global demand for natural gas peaking this decade and declining thereafter, supported the

administration's preferred policy to halt additional LNG export projects. Notably, EIA's *International Energy Outlook 2023* reference projection, which showed robust global natural gas demand through 2050, did not.[66] It is shocking that the Biden administration would set energy policy based on a deeply flawed model scenario that depends on statements of future actions by governments, statements that governments increasingly do not fulfill.

No one doubts the importance of U.S. LNG to the world energy economy. It is a perverse irony that an international organization established to boost energy security now produces "reference" modeling scenarios that one of its founding members is using to justify a policy that undermines energy security. Even IEA Executive Director Birol, himself, has championed the role of U.S. LNG in stabilizing global natural gas markets and lessening supply risks. The Biden administration's LNG export "pause," if it continues, would result in LNG supply shortages, price hikes, and greater reliance on other suppliers, like Russia, who have no regard for IEA members' energy security.

Note that IEA's own *Global Gas Security Review 2024* report concludes that global natural gas demand is rapidly increasing and likely will reach all-time highs this year and next. It also warns that "no U.S. LNG project has reached final investment decision (FID) since January 2024 following the introduction of a temporary pause on pending decisions for exports of LNG to countries that do not have free trade agreements with the United States."[67] This is an unfortunate turn of events that IEA had a hand in causing.

To be clear, IEA is not to blame for the Biden administration's poor judgment. However, IEA must think seriously about how WEO's advocacy can be used to support policies antithetical to its founding mission. IEA must also ask itself what the consequences are of being wrong about future policy and thus future demand for natural gas and other fuels and technologies. IEA's assessments of the likelihood that stated policies both will be implemented and effective are undoubtedly flawed. Yet even if they were perfect, there is still immense value in running a "business as usual" projection that, juxtaposed with STEPS or other scenarios, could provide a sense of what those stated policies might deliver and what might occur if stated policies are not implemented. This is something that cannot be done when the policies are assumed in the baseline.

Model projections do not provide answers—they provide insights. The value of those insights, however, is diminished severely by the absence of a clearly defined and defensible reference scenario. IEA's abandonment of a reference case is a risky experiment with potentially significant consequences.

None of this is to say IEA must stop running its STEPS projection. IEA should, at a minimum, however, revert to running its CPS. A CPS would not only help IEA recover its reputation for impartiality, but it also would make STEPS and the other scenarios that IEA models more valuable.

Non-Governmental Organizations and IEA's Net Zero Emissions Scenario

As shown below, these shifts in WEO, especially its adoption of a Net Zero Emissions scenario, did not happen in a vacuum. While IEA receives few direct nonprofit grants to support its operations, foundations and environmental non-governmental organizations (NGO) have spent millions of dollars campaigning to pressure IEA. Specifically, these entities have pressured IEA to alter its WEO scenarios to bring IEA's core recommendations and forecasts in line with their own interpretation of the Paris Agreement and to discourage investment in oil and natural gas production.[68]

Oil Change International is an environmental NGO that campaigns against fossil fuels. It is funded by the Rockefeller Brothers Fund, the Tides Foundation, the Hewlett Foundation, and other organizations. In 2018—a time when IEA was running its CPS—Oil Change International issued a report accusing IEA of undermining the transition away from oil, natural gas, and coal. In late 2019, the group launched a campaign called "Fix the WEO" to pressure IEA to align the climate-related scenario for its WEO with Oil Change International's interpretation of the Paris Agreement and to "focus the WEO on this strengthened climate scenario, not business-as-usual."[69] In September 2021, the campaign applauded IEA's publication of a net zero roadmap but published an open letter signed by 150 environmental NGOs urging IEA to position NZE as the central scenario in all future WEOs and IEA analyses.[70]

KR Foundation, a Danish NGO focused on making climate-related grants, gave the Sustainable Markets Foundation $4,148,000 between 2020 and 2022 to "align the IEA with Paris goals and create an Oil and Gas Exit List."[71] KR Foundation's 2021 annual report highlighted its role in pushing IEA towards prioritizing climate policies and scenarios, writing: "In May, a powerful message was sent by the International Energy Agency (IEA) with the launch of their net zero pathway report. A coalition of KR Foundation grantees led by Oil Change International, European Climate Foundation, Energy Transitions Fund, GSCC and E3G have worked for years to pressure the IEA to publish a scenario showcasing how the world's energy systems will need to transition to limit global warming to 1.5°C in line with the Paris Agreement."[72]

Another NGO active in this campaign was the European Climate Foundation (ECF), which has received funding from major environmental organizations in the United States, including Bloomberg Philanthropies, the Rockefeller Brothers Fund, and the Hewlett Foundation. It provides grants to climate change-oriented advocacy organizations in Europe. ECF's annual reports described its work to pressure IEA towards publishing a net zero scenario. Its 2021 annual report noted that ECF supported "a multi-partner campaign to ensure that the International Energy Agency (IEA) included a robust Net Zero Emissions by 2050 Scenario (NZE) in their landmark 2021 World Energy

Outlook."[73] ECF went on to say it "backed an array of energy-focused NGOs who . . . carried out advocacy campaigns in the strive for a strong net-zero scenario."[74] Its 2023 report[75] boasts that it "coordinated efforts to push for a global renewable energy target through alignment with the International Energy Agency (IEA) and other actors, notably through a dedicated event at October's 'Climate and Energy Summit: A Grand Coalition to Keep 1.5 ºC Within Reach' in Madrid and a steady drumbeat of behind-the-scenes coordination throughout the year."[76]

These and other efforts paid off, first with IEA's abandonment of CPS in 2020 and then the introduction in 2022 of NZE. Moreover, in 2021, IEA released a Net Zero Roadmap[77] that was long on aspiration but short on the things that matter most to policymakers: objective analysis of energy flows, trade patterns, security impacts, and economic effects. These deficiencies severely undermine the Roadmap's usefulness. IEA's WEO now seems more intent on modeling highly aspirational peak demand and similar "backcast" normative scenarios at the expense of more realistic and objective scenarios.

With all the other important energy security issues that IEA could be addressing—for example, China's dominance of critical minerals supply chains or Russia's dominance of the uranium conversion and enrichment markets—its disproportionate focus on net zero scenarios is myopic at best. WEO 2024 NZE, for example, assumes that for the seven years from 2023 to 2030, global carbon dioxide emissions will drop by 12.6 billion metric tons. That would be equivalent to eliminating China's carbon dioxide emissions from energy in just seven years—something few believe will happen.

As Glen Peters, Director at the Centre for International Climate and Environmental Research in Norway, admitted shortly before the UNFCCC talks in Egypt in 2022, "Individually, in private, I don't think I know of many climate scientists that think 1.5 C is possible (I could count them on a hand)."[78] He is not alone. A recent article in *Nature* reported: "*Nature's* survey of [the United Nations Intergovernmental Panel on Climate Change] authors found that only 4% of scientists predict global warming will be limited to 1.5 degrees by the end of the century. The 2022 UN Emissions Gap Report came to the same conclusion, finding that 1.5 degrees is not credible."[79] One climate scientist was even more succinct: "1.5C has been deader than a doornail."[80]

None of this should be news to IEA, which certainly must know its NZE is not a credible scenario. Environmental NGOs, however, continue to push IEA to retain its imaginary NZE as a viable scenario because it bolsters support for their calls to end investment in oil and natural gas production.

IEA members have been left to witness Executive Director Birol echoing the talking points of environmental NGOs and encouraging an end to investment in oil and gas production. After IEA's May 2021 launch of its *Net Zero by 2050*

roadmap, Executive Director Birol told The Guardian matter-of-factly, "there will not be a need for new investments in oil and gas fields, or new investments in coal mines."[81] He made similar remarks to *The Financial Times* in 2023.[82]

IEA's decision to abandon CPS, its adoption of NZE, and Mr. Birol's statements severely harm the agency's reputation for impartiality. Press and policymakers routinely draw conclusions from IEA's products, which have recommended that investment in new oil and natural gas projects must stop immediately. The very real danger, however, is that countries will act on these recommendations.

If countries act on this advice based on a scenario that almost no one thinks is plausible, future global oil, gas, and coal production will be insufficient and most likely concentrated in OPEC[83] (which, of course, includes Iran and Venezuela), Russia, and China. Many of these countries have little to no regard for international security or environmental norms. It is hard to imagine a worse piece of advice from the head of an organization devoted to energy security.

More recently, IEA has lent its imprimatur to campaigns by environmental NGOs. In September 2024, IEA joined forces with the Environmental Defense Fund (EDF) and the United Nations Environment Programme's International Methane Emissions Observatory to create an "accountability framework" on methane emissions in the oil and natural gas industry. According to EDF, the ostensible purpose of this framework is "to provide oversight of efforts being made by the whole industry, track progress and help ensure companies deliver on their promises" made through the Oil & Gas Decarbonization Charter announced at the UNFCCC talks in the United Arab Emirates in 2023.[84]

In addition to receiving a growing share of its funding from environmental NGOs, IEA appears to have taken on a quasi-regulatory function on behalf of these same organizations. IEA monitoring compliance with methane rules is something it has never done before and appears far outside IEA's scope.

IEA's Fixed GDP and the Costs of Net Zero

Another fundamental flaw with IEA's WEO is that it assumes the same rate of economic growth in all of its modeling scenarios. In other words, gross domestic product (GDP) is an input, not an output. This means that the GDP figures for STEPS, NZE, and APS are the exact same, despite the economic transformations required for each scenario to be fulfilled.

In WEO 2024, STEPS projects a decline in carbon dioxide emissions of 24 percent from 2023 to 2050, while the share of energy demand met by fossil fuels declines from 78 percent in 2023 to 57 percent in 2050.[85] In contrast, NZE projects a decline in carbon dioxide emissions of 100 percent from 2023 to 2050 while the share of energy demand met by fossil fuels declines from 78

percent in 2023 to just 14 percent in 2050.[86] It is clear that NZE is a dramatic departure from STEPS, and would have been even further away from a CPS. It represents a complete transformation of the world's energy systems in just 27 years. Yet IEA assumes no discernible impact on the world's economy.

IEA argues that this is appropriate and actually useful. The agency accepts that, "the speed, structure, and selection of policy and regulatory mechanisms driving changes in the energy system will have broader economic effects."[87] Nevertheless, IEA asserts that maintaining a constant economic growth rate across scenarios, "facilitate[s] a comparison of the impacts of different energy and climate choices with a consistent backdrop."[88]

The first question any decision maker should ask about any significant policy change is "How much will it cost, both directly and indirectly?" It is the one question IEA modeling does nothing to help answer. IEA's scenarios give the false sense that deep emissions cuts will be neither difficult nor expensive.

IEA, for example, argues that renewable energy and electric vehicles are now, or soon will be, less expensive than fossil fuels and vehicles with internal combustion engines (ICEs), respectively. Experience suggests otherwise. California's attempt to transform rapidly its energy mix is costing its citizens and industries billions. In the five years since 2018, the average price of electricity in California has jumped by half, pushing the state's average electricity price from seventh to second highest in the country.[89] This has prompted California Governor Gavin Newsom to issue an executive order to ensure that "electric service remains affordable, reliable, and safe for all Californians during our clean energy transition."[90]

If renewable technologies were less expensive, Europe also would not be imposing a carbon border adjustment mechanism.[91] A carbon tariff is an admission that the transition to renewable energy will be expensive. If renewable energy truly were more affordable than traditional fuels, as IEA contends, there would be no need for a carbon tariff.

Moreover, IEA itself uses carbon pricing in its models. Carbon pricing—a prerequisite for an effective carbon tariff—is designed to increase continuously the costs of fossil fuels so that they exceed the costs of renewables. Using carbon pricing to drive low-carbon modeling scenarios is another admission that renewable technologies, which will continue to require the backup of expensive batteries or traditional power stations, are more expensive and will remain more expensive well into the future. If renewable energy requires the backup of expensive batteries or traditional power stations, then surely that cost should be added to their cost.

Study after study has shown that meeting a net zero emission target would cost many trillions of dollars. The International Monetary Fund, for example,

found that: "[t]he path to net zero by 2050 requires low-carbon investments to rise from $900 billion in 2020 to $5 trillion annually by 2030. Of this figure, emerging and developing countries (EMDEs) need $2 trillion annually, a fivefold increase from 2020."[92] McKinsey estimates it would take investments of $9.2 trillion annually in physical assets.[93] IEA itself estimates that reaching net zero will cost $4 trillion a year over the next 30 years—$120 trillion in total.[94]

The United Nations Intergovernmental Panel on Climate Change's 2019 *Global warming of 1.5°C* report employed prices for carbon to "reflect the stringency of mitigation requirements at the margin (*i.e.*, cost of mitigating one extra unit of emission)."[95] By 2050, the cost of carbon ranged from $245 to $14,300 (in 2010 dollars) per ton of carbon dioxide equivalent.[96]

Running NZE or similar scenarios with no regard to costs does not provide policymakers with useful information. It and similar scenarios instead perpetuate misconceptions about the economic challenges, to say nothing of the technological, supply chain, geopolitical, and other challenges, of achieving deep emission cuts.

A "zero-cost" NZE makes another huge assumption: that voting publics and governments will not care about rising energy prices and less economic growth. Recent experience in Europe shows that they do. As Forbes notes: "The heavy costs of suppressing the use of fossil fuels [in Europe] while promoting intermittent, weather-dependent renewable energy technologies over the past decade has been disguised and diffused by hidden costs and fiscal transfers to powerful constituencies. But over time, 'net zero' climate policies have become increasingly unbearable for ordinary people as they reach beyond the power sector to cover agriculture, transport, homes, and buildings."[97] This frustration boiled over, for example, in the "yellow vest" protests in France[98] and the farmers protests in The Netherlands.[99] Yet nowhere in WEO does IEA even suggest the obvious question: At what point in the net zero trajectory do consumers and the body politic (at least in democracies) rebel?

Making GDP an input also ignores an ironclad reality of climate politics. Countries, especially those with developing and emerging economies, will not sacrifice economic growth to address climate change. India's Energy Minister, Raj Kumar Singh, could have been speaking for many developing and emerging economies when he said net zero by 2050 was "pie in the sky." He explained: "you have 800 million people who don't have access to electricity. You can't say that they have to go to net zero, they have the right to develop, they want to build skyscrapers and have a higher standard of living, you can't stop it."[100]

The African Energy Chamber and its Chairman, N.J. Ayuk, have criticized IEA for pressuring African nations to disavow African oil producers.[101] Mr. Ayuk also has taken issue with IEA's unrealistic net zero scenarios, saying, "African countries are hardly alone in their refusal to accept global pressure to rush

their transition from fossil fuels to renewable energy sources like solar, wind, and hydrogen power."[102]

An NZE is unrealistic enough. An NZE that ignores its economic consequences and the political limitations that come with them is anything but helpful.

Concentration of Critical Minerals, Renewable Energy, and Electric Vehicle Battery Supply Chains

While IEA spends resources and fixates on pursuing an unattainable NZE, it is giving short shrift to serious energy security concerns about the energy transition it is advocating. Chief among these is the issue of critical mineral supply chains.

Critical minerals such as copper, manganese, graphite, nickel, lithium, neodymium, cobalt, rare earths, and others are key inputs to wind and solar technologies, EVs, and batteries. An EV, for example, uses more than twice the amount of copper and manganese than a conventional car. Moreover, unlike a conventional car, an EV uses significant amounts of lithium, nickel, cobalt, neodymium, and graphite.

In 2019, an analysis from the United Kingdom found that to replace all of the United Kingdom's nearly 32 million cars with electric cars would require about twice the cobalt, nearly all the neodymium, 75 percent of the lithium, and 50 percent of the copper produced in the entire world in 2018.[103] To put these figures in perspective, the U.S. automobile fleet is about 260 million cars.[104]

In 2020, the World Bank estimated that over the next 25 years, the world will need to mine the same amount of copper that has been mined over the past 5,000 years.[105] By 2040, IEA projects demand for lithium to soar by 4,200 percent, graphite 2,500 percent, nickel 1,900 percent, and rare earths 700 percent.[106] IEA also reports that globally it takes 10 to 16 years to open a new mine, making it highly unlikely world production will keep up with world demand for these minerals.[107]

Mining and refining such large quantities of these materials present major challenges. As energy and mining author, Mark Mills, explains regarding copper, "Global mining industries aren't planning or even capable of producing the quantities needed in the timeframes proposed."[108] Complicating matters is the degree to which the supply chains for copper and other critical minerals are concentrated in the hands of, and tainted by, countries like China and Russia that have little regard for international security, human rights, or environmental safeguards.

IEA's WEO 2024 estimates that from 2023 to 2035, 90 percent of the supply growth for battery-grade graphite and nickel will derive from China and Indonesia.[109] It also estimates that about 45 to 75 percent of the supply growth for refined copper, lithium, cobalt, and rare earths will come from China.[110]

In addition to mineral production, IEA reports that China has a very large proportion of existing global manufacturing capacity for solar photovoltaic, wind, heat pumps, electrolyzers and battery components, including 90 percent of battery cathode active materials and 98 percent of capacity for battery anode active materials.[111] IEA expects China to maintain its dominance in these sectors through 2030. China now produces more EVs than any other country and has sufficient unused capacity to produce far more.

To put those figures into perspective, production data from EIA show that today OPEC produces about 35 percent of the world's crude oil.[112] In 1973, the year the Arab Oil Embargo began, OPEC controlled about55 percent of the world's crude oil supply.[113]

The concentration of critical mineral supply chains presents an intolerable and intractable security risk for the United States and other IEA member countries. China has repeatedly demonstrated its willingness to restrict exports of critical minerals to specific IEA member countries. In 2010, China tried to halt the export of rare earths to Japan. In December 2024, it announced an embargo on exports, including transshipments, to the United States for gallium, germanium, graphite, and antimony as well as certain "superhard" materials.[114]

On the manufacturing side, a rush to electric vehicles and wind and solar power promises to make the United States even more dependent on China and foreign sources of critical minerals than at present. U.S. climate and energy policy should not give our adversaries a geopolitical edge.

The geopolitical stakes are high. In trying to wean itself off Russian oil and natural gas, Europe has embarked on a program to electrify vehicles. *Reuters* describes a 2023 report prepared by the Spanish presidency for European Union leaders, noting how this could make Europe more dependent on China: "Without implementing strong measures, the European energy ecosystem could have a dependency on China by 2030 of a different nature, but with a similar severity, from the one it had on Russia before the invasion of Ukraine."[115]

Europeans are right to be worried in particular about the incursion of Chinese EVs. According to Matthias Schmidt, the publisher of the *European Electric Car Report*, the company with the fastest growing EV sales in Europe is China's BYD.[116] UBS estimates that, by 2030, western automakers' global market share will drop from 81 percent to 58 percent. "That would be a crisis moment for Western legacy companies," said UBS.[117]

There is no escaping the fact that converting the U.S. auto fleet to EVs means importing large amounts of critical minerals. While the United States has large quantities of these minerals, it is unlikely we will be able to mine and process the amount of minerals needed to replace each car in the U.S. with an EV.

Moreover, current data from the U.S. Geological Survey's *Mineral Commodity Summaries 2023* suggest other countries, including geopolitical rivals like China and Russia, have much bigger resources of six key minerals used in EVs than the United States.[118] These include copper, cobalt, graphite, lithium, manganese, nickel, rare earths, and zinc.

World and U.S. production of these minerals is presented in Table 1. The data indicates that the U.S. already depends on imports for most of these mineral ores. The U.S. also imports more than 96 percent of the rare earth compounds and metals and 76 percent of the refined zinc we use.

Table 1. Mine Production and Import Reliance for Key Minerals Used in EVs: 2023

Mineral	Global Production (1,000 metric tons)	U.S. Production (1,000 metric tons)	U.S. Share of Global Production (%)	U.S. Net Import Reliance(%)
Cobalt	230	0	<1%	67%
Copper	22,000	1,100	5%	46%
Graphite	1,600	0	0%	100%
Lithium	180	NA	NA	>25%
Maganese	20,000	0	0%	100%
Nickel	3,600	18	<1%	57%

Source: U.S. Geological Survey Mineral Commodity Summaries 2024.

To its credit, IEA has highlighted the large share of critical minerals production and refining as well as battery and renewable energy manufacturing that is controlled by China and Chinese companies. IEA's 2024 scenarios—by the agency's own admission—do not contain any attempt at realistic modeling of the price impact of demand vastly exceeding supply.

The reality will surely be something different. Indeed, it would be politically untenable to accept the national security vulnerabilities that would prevail should the U.S. become even more dependent on China for critical minerals.

Today, IEA's WEO suggests that the United States and other IEA members will be willing and able to replace domestically-produced oil, natural gas, and coal with imported minerals and manufactured renewable and vehicle technologies.

IEA could provide a real service to its members if it devoted the resources it spends on the NZE to creating a credible scenario around: (1) the likelihood producers can boost the supply of critical minerals to satisfy future demand; and (2) the energy security, labor, environmental and other implications if China, Russia, and other countries continue to dominate the production and refining of these minerals and the supply chains of manufactured goods.

Russian Dominance of Uranium Conversion and Enrichment

Russia's dominance of supply chain for uranium conversion and enrichment services also merits the sustained attention of IEA.

IEA and others have made the obvious point that deep global emissions reductions cannot not happen without more nuclear power. IEA's WEO 2024 explains that in STEPS, "Nuclear power contributes to the growth of clean power sources reflecting efforts to maintain the existing fleet of nuclear reactors and construction of new reactors in around 30 countries."

While IEA's WEO 2024 rightly discusses at length Russia's invasion of Ukraine and its impact on oil and natural gas markets, there is no mention of Russia's significant role in fueling nuclear reactors and the risk that it poses.

IEA's 2022 report on nuclear power, *Nuclear Power and Secure Energy Transitions*, covers some of this ground. It notes that Russia supplies nuclear fuel to 73 Russian-designed reactors accounting for about one-fifth of the global market.[119] IEA explains that Russia "plays an even more significant role in the production of uranium fuel, accounting for 38% of uranium processing (conversion) worldwide and over 45% of fuel enrichment capacity in 2020."[120] It goes on to say that "Euratom . . . estimates that Russian companies provided about 24% of uranium conversion services and 25% of enrichment services to EU utilities in 2020."[121] However, in a 95-page report devoted to nuclear energy, IEA only fleetingly addresses the energy security risks surrounding Russia's role in uranium and nuclear fuel supply chains. IEA's only meaningful statement on uranium notes "the conflict [in Ukraine] raises questions about Russia's future as a producer and exporter of nuclear fuel supplies."[122]

This is a much bigger concern than IEA lets on. Following Russia's invasion of Ukraine, western governments quickly moved to sanction a number of critical industries in Russia. Absent from the long list of sanctions targeting the Russian economy was enriched uranium used in nuclear reactors.

Unlike oil and natural gas, enriched Russian uranium cannot be easily displaced in the world's nuclear fuel market. Before it can be fabricated into fuel for a nuclear reactor, natural uranium must be mined, milled, converted, and then enriched to achieve the desired level of U-235 in the fuel. Russia's state-owned nuclear monopoly, Rosatom—a company founded under Vladimir Putin—has for decades unfairly undercut its western rivals. It is now the world's dominant supplier of uranium conversion and enrichment services.

According to the World Nuclear Association, Russia controlled around 44 percent of the world's enrichment capacity and 20 percent of global conversion capacity in 2022 (Tables 2 and 3).[123]

Recognizing the national security risks that Russian nuclear fuel supplies pose to the United States, Congress passed legislation to ban imports of Russian uranium in April 2024. Congress also appropriated billions of dollars to bolster American nuclear fuel production.[124] These investments to increase conversion and enrichment capacity, however, will take significant time to bear fruit.

Table 2. World Uranium Enrichment Capacity

Operator	Country	Capacity (1,000 Separative Work Units Per Year) 2022	2025	2030
CNNC	China	8,900	10,000	17,000
ORANO	France	7,500	7,500	7,500
ROSATOM	Russia	27,100	27,100	27,100
URENCO	USA	17,900	17,900	17,900
OTHER (INB, JNFL)		100	400	800
Total		61,500	62,900	70,300

SOURCE: World Nuclear Associaton

Table 3. Estimated World Primary Conversion Capacity and Uranium Hexaflouride Production 2022

Company	Country	Licensed Capacity (Tonnes Elemental Uranium (tU))	Licensed Capacity (tU)
CAMECO	Canada	12,500	10,600
CNNC (EST.)	China	15,000	10,500
CONVERDYN	USA	7,000	0
ORANO	France	15,000	8,900
ROSATOM (EST)	Russia	12,500	12,000
Total		62,000	42,000

SOURCE: World Nuclear Associaton

Rosatom's dominance of the enrichment market not only impacts today's fleet of nuclear reactors, it also jeopardizes the next generation of advanced nuclear reactors. Many advanced reactors proposed in the U.S. and abroad require high-assay, low-enriched uranium (HALEU). In contrast to low-enriched uranium, which is enriched up to 5 percent with U-235, HALEU is enriched between 5 and 20 percent. IEA's nuclear report notes that "Some SMR designs and other advanced reactors in development rely on innovative fuels, such as High Assay Low Enriched Uranium, which have few suppliers or are not yet commercially available."[125] IEA fails to mention, however, that there is only one commercial supplier of HALEU in the world today: Russia's Rosatom.

Foreign Policy magazine warns: "Russia has a complete monopoly on the production of advanced nuclear fuel [*i.e.*, HALEU] that will be needed to power the next generation of nuclear reactors . . . Russia hasn't yet used its exports of uranium as a geopolitical weapon, unlike its exports of natural gas—but it could at almost any time."[126] It is a tangible and immediate energy security threat to which IEA should be devoting significant resources.

EV Adoption: IEA Accentuates the Positive, Eliminates the Negative

Henry Ford famously said his customers could buy one of his Model Ts in any color they wanted, so long as it was black. Judging from IEA's recent work, it thinks consumers should be able to buy any car they want, so long as it is electric.

IEA seems oblivious to the obvious problems of widespread EV adoption. Their views on EVs are probably best captured in this excerpt from its 2024 report, *Strategies for Affordable and Fair Clean Energy Transitions*:

> *The cost differential between electric vehicles and internal combustion engine (ICE) counterparts has narrowed over the years thanks to policy support, scale economies and technological advances. Despite this, the unsubsidised sticker price of EVs remains higher in most markets than that of ICEs. However, the picture changes in some markets when looking at lifetime ownership costs, which include fuel and maintenance costs and also factor in subsidies, tax incentives and resale values. . . On this basis, EVs have already become cheaper than their ICE counterparts in markets such as China, Germany and Norway. In Norway, for example, a combination of generous EV subsidies and tax incentives means that electric cars in 2022 cost 15% less than ICEs on average, and 30% less in the case of medium-sized cars.*[127]

It would be more accurate if IEA were to say that EVs cannot compete against ICE vehicles without subsidies. The "generous EV subsidies" that IEA touts do not lower the cost of an EV. They shift the cost, which lowers the purchase price of an EV. The additional cost of an EV compared to an ICE vehicle does not go away. It is either picked up by taxpayers through subsidies (which IEA mentions) or is eaten up by automakers through lost revenues (which IEA does not mention). EV demand is almost wholly dependent on costly subsidies.[128]

The auto business is highly competitive, and revenue losses cannot go on forever. Take Ford, for instance. It reported a staggering $130,000 in losses for each of the 10,000 EVs it sold in the first quarter of 2024 (compared to $1,400 in gain for each of the 600,000 ICE vehicles it sold).[129] EV losses continued into the second quarter. For the first half of 2024, Ford lost $2.5 billion on EVs.[130] In 2023, the average loss for each EV that Ford sold was on the order of $48,000.[131]

Ford is not the only company to have suffered losses. *Jalopnik* reports: "U.S. automakers lose roughly $6,000 on every $50,000 EV they sell in America, according to a new report from analyst firm Boston Consulting Group (BCG). That figure comes hotly on the heels of similar sky-high losses from companies

like Rivian and Lucid. Earlier this year, Rivian revealed that it lost $33,000 on every truck sold, while Lucid topped that figure with its eye-watering $400,000 losses on each car sold. Yikes."[132]

While GM reported a first-quarter 2024 profit, *Fortune* reports that, "the automaker's strong financial performance is powered by gas: GM's quarterly gains were led by its popular SUVs and gas-powered car lines, while producing EVs continues to lose the company money."[133] Other automakers find themselves in a similar bind, building vehicles that politicians want but consumers are hesitant to buy without subsidies.

In 2023, Stellantis's then-CEO Carlos Tavares warned that "legacy" automakers could find themselves out of business by the end of the decade because of the forced move to electrification. "We are doing very good money with the legacy business," According to Mr. Tavares, "there is still a lot of uncertainty out there" in the EV business.[134] Right now, it is the sale of ICE-equipped vehicles, which consumers want, that is keeping EV sales viable.

Even subsidies, however, may not be enough to overcome consumer preferences that favor ICE vehicles, as we are beginning to see in the United States. Except for the briefest of mentions, IEA ignores consumer preferences just as it ignores the shortcomings of EVs that create the uncertainty.

Range and recharging anxieties and the high price of EVs compared to gasoline vehicles remain huge and well-documented concerns for potential customers. But there are others. IEA implies that EVs are less expensive to own, but it ignores some factors important to consumers. EVs have, for example, much higher insurance costs because they are more expensive to repair or replace. According to Experian: "it costs more to insure an EV—specifically, $44 more per month on average—than a gas-powered car, according to the National Association of Insurance Commissioners (NAIC). Similarly, Insurify reports that EV car insurance premiums average $357 compared to $248 for gas-powered vehicles—a 44% increase."[135] That tracks with a recent report showing that, in 2023 in the United States, "the average repairable severity for repairable EVs was $6,018 compared to $4,696 for ICE alternatives."[136]

IEA also contends that the value of a used EV exceeds that of a comparable ICE-equipped vehicle, something completely at odds with recent experience. An analysis by iSeeCars found something different. It examined more than 2.2 million used car prices in February 2024 and found that EVs are losing their value much faster than cars with gasoline engines. According to an iSeeCars executive analyst, "It's clear used car shoppers will no longer pay a premium for electric vehicles and, in fact, consider electric powertrains a detractor, making them less desirable—and less valuable—than traditional models."[137] *Wired* also reported that EVs are losing more than 50 percent of their value in the first year.[138] All of this will be news to people reading IEA's WEO 2024.

IEA's WEO likewise misses the growing dissatisfaction with EVs from the people who should know best—EV owners. A recent global survey conducted by McKinsey found that 46 percent of U.S. EV drivers are likely to purchase an ICE-equipped vehicle next.[139] Even with lavish subsidies and EV mandates, McKinsey found a global figure of 29 percent returning to ICE vehicles. Similar results have been reported elsewhere.[140] Charging difficulties and the difficulties of taking long trips were major factors. A third of respondents who said they were switching back, however, cited the high total cost of ownership—this despite IEA's claim that it is less expensive to own an EV. It is worth noting that the majority of EV buyers are in the top income quintiles.

IEA also discounts the reported retrenchment in EV investment occurring in the auto industry because of tepid EV demand. *MotorTrend* recently recognized this trend, writing: "Reports of the death of the internal combustion engine have been greatly exaggerated. In the wake of stalled consumer demand and stubbornly high costs, automakers around the world are furiously backpedaling plans to go all-in on EVs within the next 10 years, as well as rethinking their approach to the internal combustion engine."[141]

These recent headlines, which appeared as IEA was preparing its WEO 2024, document further how auto companies' and consumers' disillusionment with the forced EV transition runs deep and is global:

- "The Big Miss on Electric Cars Is Remaking Europe's Auto Industry" February 20, 2024, *Bloomberg.*[142]
- "Aston Martin delays first electric car as losses narrow" February 28, 2024, *Reuters.*[143]
- "VW Turns on Germany as China Targets Europe's EV Blunders" " September 2, 2024, *Bloomberg.*[144]
- "Stellantis pauses production of electric Fiat 500 due to poor demand" September 12, 2024, *Reuters.*[145]
- "Stellantis delays investment plans for Illinois" August 20, 2024, *Reuters.*[146]
- "Toyota to slow EV output to 30% below previous 2026 sales forecast" September 6, 2024, *Nikkei Asia.*[147]
- "Volvo Cars abandons 2030 EV-only target" September 4, 2024, *Reuters.*[148]
- "Volkswagen's battery targets not 'set in stone', battery chief tells FAS" August 23, 2024, *Reuters.*[149]
- "Volkswagen Hits the Net Zero Wall" October 29, 2024, *Wall Street Journal.*[150]
- "Ford Pulls Back Its Electric Vehicle Push" August 21, 2024. *New York Times.*[151]

- "Ford slows EV plans, delaying pickup and axing three-row SUV, to cut costs" August 21, 2024, *Reuters*.[152]
- "Cooling EV Sales Have Tesla, GM and Ford Rethinking Investments" November 4, 2023. *Bloomberg*[153]
- "Porsche waters down EV ambitions, says transition will take 'years'" July 22, 2024, *Reuters*.[154]
- "Renault CEO calls for flexibility in European EV transition timeline" June 22, 2024, *Reuters*.[155]
- "GM cuts EV production forecast, approves $6 billion share buyback" June 11, 2024, *Reuters*.[156]
- "GM not reiterating 2025 1 million EV production capacity forecast" July 15, 2024, *Reuters*.[157]
- "Mercedes-Benz delays electrification goal, beefs up combustion engine line-up" February 22, 2024, *Reuters*.[158]

There is little question that EVs have a future, but they are not for everyone. Most EVs today are owned by families with high incomes, who live in houses with driveways and garages, and own a conventional vehicle for long trips, emergencies, power outages, and harsh weather. No amount of cheerleading and optimistic projections is going to change these dynamics anytime soon.

There also is the fact that China is now the largest EV manufacturer in the world. As with critical minerals, countries with incumbent automobile sectors, like Germany and the United States, are not going to allow Chinese EV companies to dominate EV supply chains and drive their domestic industries out of business. These companies contribute too much to their economies and employ too many people. European, Canadian, and U.S. labor unions are catching on to the fact that the transition to EVs means a transition to fewer jobs in the automobile industry. Rushing ahead with the EV transition championed by IEA will throw away the advantages that these countries have. It will also make China a more important player in a critical industry for many countries.

Tear Down IEA's Data Paywalls

Like EIA, IEA should make its data, methodologies, and assumptions publicly and freely available. Most of this work is produced using taxpayer funding, and taxpayers should have access to them.

Many IEA datasets are behind paywalls. IEA has imposed these restrictions at the direction of member countries requiring the agency to raise funds from the sale of licensed data. IEA, however, has carried this out to an extreme.

When Senator Barrasso and Representative McMorris Rodgers asked IEA why it puts so much of its data and methodologies behind paywalls, it responded

that some of these data are available for WEO.[159] It ignored, however, the long list of items (Table 4) for which it charges sometimes considerable amounts of money. IEA needs to adopt similar practices on data accessibility as EIA, and IEA members should encourage IEA to do so. Taxpayers should not have to pay for things twice. At the bare minimum, IEA should make all of its data, including modeling output, freely available, as EIA does.

Conclusion

IEA was established in the aftermath of a global energy crisis. Until recently, it has played a valuable role in helping energy-consuming countries reduce their exposure to energy shocks. It now fully embraces energy-transition advocacy.

As this report documents, IEA has yielded to pressure and adopted a slanted view of energy policy, from net zero by 2050 to peak oil demand by 2030. In doing so, it risks losing the confidence of many of its members and much of the public who follow these issues. Once trust is lost, it is very difficult to recover.

It is troubling that a politician can state, as French President Macron did, that IEA is "the armed wing of the Paris Agreement" without any word of dissent from IEA. It is of little wonder that IEA is now seen by many as taking sides on one of the most consequential and costly policy pursuits of our time.

IEA's apparent fixation on and advocacy for an unattainable net zero "energy transition" by 2050 has caused it to stray from its founding mission. IEA's modeling and public statements made by its leadership over recent years have undermined energy security by actively discouraging investment in traditional energy supplies—specifically, oil, natural gas, and coal.

If IEA members act on IEA's advice, future global oil, natural gas, and coal production will be insufficient and concentrated in OPEC (which includes Iran and Venezuela), Russia, and China. Many of these countries have little regard for international security and environmental norms. That IEA would entertain such a position indicates how it has veered from its original mission. Simply put, IEA needs to change its "direction of travel" back toward energy security.

It can start by reinstating its historical policy-neutral, unbiased CPS projection of the kind done by EIA and other leading energy forecasting groups. It is impossible to assess the cost and benefits of competing proposals and scenarios without a "business as usual" baseline. Putting new climate policies in the baseline deceives policymakers as to the efficacy and cost of climate measures. An IEA CPS would make its STEPS or APS more valuable. It is also time for IEA to scrap its NZE.

Table 4: IEA Data Behind Paywalls

DATA SET	DESCRIPTION	PRICE IN EUROS
Coal Information	A comprehensive review of historical and current market trends in the world coal sector.	640
Electricity Information	Annual data on electricity and heat supply and consu-mption for OECD and selected non-OECD countries.	640
Emissions Factors 2023	Annual GHG emission factors for world countries from electricity and heat generation.	640
Energy End-uses and Efficiency Indicators	Annual data from 2000 covering end-use energy consumption, now featuring end-use carbon emissions for the IEA member countries and beyond, updated twice a year.	640
Energy Prices	Combination of regularly-updated world energy prices covering 141 countries, and energy prices and taxes for OECD countries.	1,630
Monthly Gas Data Service	Monthly data on natural gas balances, imports and exports for OECD countries.	930
Monthly Oil Data Service Complete	The complete data behind the IEA's monthly Oil Market Report.	10,670
Monthly Oil Data Service Field by Field Supply	Monthly, quarterly and annual production data with forecasts for major fields and production streams for nearly one hundred OECD and non-OECD countries.	3,580
Monthly Oil Data Service Supply, Demand, Balances and Stocks	Historical and forecast monthly, quarterly and annual data for supply, demand, balances, stocks and refinery throughput.	7,150
Monthly Oil Data Service Trade	Monthly information on OECD member countries' imports from over 90 origins and exports to over 80 destinations for 21 products.	2,380
Natural Gas Information	Time series of annual gas supply balances, imports and exports for OECD and non-OECD countries, updated twice a year.	640
Oil Information	Annual time series of oil data including oil supply and consumption, trade and oil demand for 153 countries and 25 regions, updated twice a year.	640
Oil Market Report	Monthly access to information on supply, demand, stocks, prices and refinery activity.	3,200
Renewables 2023 Dataset	Full access to all the report's data in Excel format, plus additional premium data for the electricity sector, including additional historical years.	640
Renewables Information	Annual time series on renewables and waste production, supply and consumption for OECD and non-OECD countries, updated twice a year.	640
World Energy Balances	Energy balances for 156 countries and 35 regional aggregates.	930
WEO Extended Dataset	Includes the latest World Energy Outlook Extended data.	640
World Energy Statistics	Basic energy statistics for 156 countries and 35 regional aggregates.	930
World Energy Statistics & Balances	Combines World Energy Balances and World Energy Statistics in a single, discounted package.	1,630

IEA's STEPS and NZE—not to mention damaging statements from its leadership—also help propagate the fiction that investment in oil and natural gas is no longer necessary because oil and natural gas are on the way out—a position that environmental NGOs and the media are only too eager to echo.

Such misunderstandings can justify and encourage bad policies, as it did the Biden administration's LNG export permit "pause."

IEA leaders should also refrain from questioning investments in new oil and natural gas production. Instead, they should be documenting and reporting on what is in fact happening. Companies are investing in new oil and natural gas production because the world still depends on these fuels and will continue to depend on them well into the future. Oil and gas companies are sophisticated investors operating in a global market. Their investment decisions are based on, among other things, expected future demand for their products.

IEA should be more circumspect in cautioning companies about oversupply, particularly given the energy security benefits that result from additional oil and natural gas. It would be even more useful if IEA were to make clear the impediments and opportunities for greater investment in oil and natural gas supplies because those fuels will be needed for the foreseeable future.

IEA can improve its transparency by making more of its data—which are funded by taxpayers—available at no cost. IEA can also provide more clarity about its scenarios. Both would go a long way toward restoring some of IEA's standing with its members and the consumers of its products.

In the same spirit of transparency, IEA should disclose all voluntary contributions and their sources. This would make it clear who is funding the IEA beyond the member country contributions.

Finally, the "energy transition" that IEA is championing presents an unacceptable risk to energy security. While IEA spends resources on impossible net-zero-by-2050 projections, it gives short shrift to the energy security implications of such a transition. IEA has an obligation to incorporate concerns about China's dominance of critical mineral and related manufacturing supply chains into its scenarios. It also has an obligation to incorporate concerns about Russia's dominance of uranium and nuclear fuel supply chains into its scenarios.

China, Russia, Iran, North Korea, and Venezuela pose challenges both old and new to world energy security. A strong, unbiased IEA can help us navigate these challenges, but only if it has the confidence of its members.

IEA was once the gold standard of energy security, but its reputation has lost its luster. In the 119th Congress, the Senate must work to restore IEA's credibility and revive its core mission—energy security.

Endnotes

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