The Coalition of Finance Ministers for Climate Action

How fossil-fuel reliant Ministries of Finance can assess the fiscal risks of global climate action

Inter-American Development Bank (IDB), French Development Agency (AFD), and University College London

Adrien Vogt-Schilb and Steve Pye

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Global oil demand could peak before the end of this decade (IEA, 2024a, b). Electric vehicles (EVs) already represent 18% of new car sales, and their adoption is accelerating rapidly. China's EV sales increased by more than 25% in February and March 2023 compared with March 2022 , and major automakers plan to introduce numerous new electric models by 2027 (IEA, 2023). Additionally, renewable energy is increasingly replacing fossil fuel-based generation, driven by technological advancements and Government policies. The world is expected to invest US$2 trillion in clean energy in 2024, against only US$1.1 trillion in fossil fuels (IEA, 2024c).

The energy transition poses a serious challenge for oil and gas exporters. In Libya and Equatorial Guinea, for example, fossil fuel exports represent 40% of GDP (Mesa Puyo et al., 2024), while in Iraq and Kuwait more than 90% of Government revenue comes from taxing commodities. As the global energy landscape shifts due to climate change policies and technological advancements, the future demand for and prices of oil and natural gas will become increasingly uncertain. This uncertainty threatens fiscal revenues from fossil fuel extraction, prompting Ministries of Finance to reevaluate economic dependencies and fiscal strategies.

Many studies evaluate how technology and climate policy can affect fossil fuel production. For instance, Welsby et al. (2021a) find that by 2050, nearly 60% of proven oil and natural gas reserves and 90% of coal must remain underground to keep global emissions within a 1.5°C carbon budget. These studies crucially warn MoFs about the limited future for fossil fuel production and the consequences for trade and GDP (see, for example, Mercure et al., 2018), but they do not evaluate the fiscal consequences of these so-called *stranded assets*. Additionally, most existing studies provide numbers on a global or regional basis, giving less information at the country level. Finally, they typically rely on a single scenario for future fossil fuel demand, ignoring the uncertainty about carbon budgets and technology choices that affect the global energy system.

Two papers demonstrate a comprehensive modeling approach designed to address these limitations and assess potential fiscal revenues from fossil fuel production at the country level in a wide range of possible futures (Solano-Rodriguez et al., 2019; Welsby et al., 2021b). The studies employ a combination of models, including the TIMES Integrated Assessment Model (TIAM-UCL), the Bottom-Up Geological and Economic Oil Field Model (BUEGO), and the Global Gas Production, Trade, and Annual Pricing Model (GAPTAP). These models integrate global energy demand forecasts and economic and geological data at the project level. They also represent the different tax regimes that apply to each field, depending on the fiscal policies particular to each country. The papers focus on Latin America and the Caribbean and provide results for the region as a whole and for a dozen individual countries.

Their results suggest that absent fiscal reform, the region could lose trillions of dollars in royalties during the global energy transition. The studies find that stringent global climate action could reduce cumulative Government take in Latin America and the Caribbean to US$1.3–2.6 trillion by 2035, compared with US$2.7–6.8 trillion if oil demand followed historical trends. The impact varies by country, depending on the relative cost of producing oil and the prevalent fiscal regimes.[1] Revenue from gas is less affected, being reduced by about US$100 billion during the energy transition, mostly because gas does not provide significant fiscal revenue to countries in the region to start with.

To navigate the uncertainties and fiscal challenges posed by the global energy transition, fossil fuel-dependent countries can draw inspiration from nations that have successfully diversified their economies. For instance, Dubai has reduced its reliance on oil and gas by investing in financial and trade services and tourism, while Norway has utilized its sovereign wealth fund to invest in various industries, including technology and green energy, maintaining economic stability, and fostering sustainable growth.

To develop robust fiscal strategies, MoFs in fossil fuel-dependent countries should employ comprehensive scenario planning and modeling tools, such TIAM-UCL and BUEGO, to understand the

1 Prince et al. (2023) and Mesa Puyo et al. (2024) reach the same general conclusion at the global level, using simpler models with less detailed representations of energy transformation and energy demand.

potential impacts of different energy transition scenarios, or use simpler models such as those used by Prince et al. (2023) and Mesa Puyo et al. (2024). By learning from successful examples and leveraging strategic analyses, fossil fuel-dependent countries can build more diversified and resilient economies, better equipped to thrive in a cleaner, more sustainable world.

References

IEA (2024a) Oil 2024. *Analysis and forecast to 2030*. International Energy Agency. https://www.iea.org/reports/oil-2024.

IEA (2024b) *Global EV Outlook 2024*. International Energy Agency. https://www.iea.org/reports/global-ev-outlook-2024.

IEA (2024c) *World Energy Investment 2024*. International Energy Agency. https://www.iea.org/reports/world-energy-investment-2024.

IEA (2023) *Global EV Outlook 2023*. International Energy Agency. https://www.iea.org/reports/global-ev-outlook-2023/trends-in-electric-light-duty-vehicles.

Mesa Puyo, Diego, Augustus J. Panton, Tarun Sridhar, Martin Stuermer, Christoph Ungerer and Alice Tianbo Zhang (2024). Key Challenges Faced by Fossil Fuel Exporters during the Energy Transition. *IMF Staff Climate Notes* 2024(1). https://doi.org/10.5089/9798400270147.066.

Prince, Guy, Greg Muttitt, Rich Collet-While and Mike Coffin (2023) *Petrostates of Decline: Oil and Gas Producers Face Growing Fiscal Risks as the Energy Transition Unfolds*. Carbon Tracker Initiative, . https://carbontracker.org/reports/petrostates-of-decline/.

Solano-Rodríguez, Baltazar, Steve Pye, Pei-Hao Li, Paul Ekins, Osmel Manzano and Adrien Vogt-Schilb (2021) Implications of Climate Targets on Oil Production and Fiscal Revenues in Latin America and the Caribbean. *Energy and Climate Change* 2, Paper 100037. https://doi.org/10.1016/j.egycc.2021.100037.

Welsby, Dan, James Price, Steve Pye and Paul Ekins (2021a) Unextractable Fossil Fuels in a 1.5 °C World. *Nature* 597(7875), 230–234. https://doi.org/10.1038/s41586-021-03821-8.

Welsby, Dan, Baltasar Solano, Steve Pye and Adrien Vogt-Schilb (2021b) *High and Dry: Stranded Natural Gas Reserves and Fiscal Revenues in Latin America and the Caribbean*. Inter-American Development Bank. https://doi.org/10.18235/0003727.