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RECOUPLING

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Dear friends of the Global Solutions Initiative,



Dennis J. Snower
President, Global
Solutions Initiative



Markus Engels
Secretary General,
Global Solutions
Initiative

After a long pandemic, we are delighted to once again open our doors and welcome you to the Global Solutions Summit in Berlin. At the heart of the Global Solutions Initiative is our network: spanning the globe, it brings together thought leaders, visionaries, and pioneers – who are all united in their goal of solving global challenges. While digital ties and online events sustain the network throughout the year, our annual in-person gathering is crucial for strengthening the GSI community, equipping it to face today's challenges. Nowadays, acute geopolitical tensions dominate the agenda. Yet it remains just as urgent that we come together to tackle ongoing global problems such as climate change, poverty, and hunger.

How can we face these challenges? The articles in the Global Solutions Journal suggest a way forward, serving as inspiration, food for thought, and the intellectual backbone for Summit discussions. The Journal results from a fruitful collaboration between our partners – from think tanks, governments, companies, international organizations, and academic institutions. This is exactly the kind of multistakeholder approach we need now. By fostering an environment where our international network of experts and pragmatists are encouraged to overcome a silo

mentality and engage across disciplines, we hope to develop strategies fit for the complex, interdependent demands of the problems we now face. Furthermore, in light of the current and upcoming “Global South” G20 presidencies – India, and later Brazil and South Africa – the Summit can make a real contribution to issues that disproportionately affect these nations.

The articles in this journal span a range of topics – from transforming our notion of economic and social prosperity to promoting food security, the net zero energy transition, and lifelong education, and to achieving sustainable SDG financing. They demonstrate not only the scale and complexity of the issues at hand, but also the potential we have to transform our systems and societies to build a more equal, sustainable, and responsible future. In our work, the path ahead is not always clear. It is clear, however, that we need to act now and, at the same time, develop thoughtful, long-term strategies to cope with these challenges; these articles show that we have the expertise and the will to do both. This way, they provide the ideal launching pad for dynamic and solutions-focused discussions at the Global Solutions Summit.

As always, the entire Global Solutions Initiative team has worked tireless-

ly to prepare a Summit rich in open and detailed discussion where perspectives from policy, business, academia, and civil society come together. We expect Summit guests to engage in heated debate, challenge and inspire each other as we work hand-in-hand and contribute to the success of the G20 and G7 presidencies. This May we will welcome you to the Summit with open arms – and an open mind.

With hope and confidence,
Dennis and Markus

Global Solutions Journal

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The G20 & GDP: The Cost of Uncoupling from Fossil Fuels

Research Paper

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The world needs to consciously uncouple from fossil fuels to move toward a low-carbon future. But global oil and gas industry revenues touched a record high of USD 4 trillion in 2022 (Reuters, 2023), as major economies started recovering from the shock of the COVID-19 pandemic. Much of the intended transition away from fossil fuels depends on G20 countries (the G20), which account for 80% of global GDP, and collectively consume 85% of the world's coal, oil and natural gas annually (BP, 2022). Many of these countries also trade fossil fuels for revenue and balance of payments.

At the first meeting of the Energy Transition Working Group (ETWG) of India's G20 presidency in February 2023, the G20 agreed on the need to prioritize energy security and diversify supply chains, underscoring that transition pathways should depend on each country's "energy base and potential." The G20 concurred that fossil fuels would "continue to be used more or less in most of the countries in the coming 15 to 20 years," until cleaner energy sources like renewables reliably and affordably replace them (PIB, 2023).

This pragmatic view has merit. Fossil fuels are ubiquitous because they are easily accessible, cheap and versatile. Abruptly ceasing fossil fuel consumption and production would disrupt industrial output, transportation, fossil fuel tax-funded social programs, and millions of livelihoods dependent on these sectors in most countries. It would devastate painstaking gains in modern energy access in many developing and least developed countries, depriving billions of people of basic developmental needs.

Beyond providing energy, fossil fuels are integral to a plethora of non-combustion derivatives, including petroleum products, lubricants and solvents, construction materials, chemicals, and fertilizers. A barrel of oil shipped worldwide can be used to fuel a medium-sized car for 450 kilometers, or generate 70 kWh of electricity, or pave tar roads, or make sundry items like skin care products, birthday candles, plastic bags, and synthetic clothing (Desjardines, 2016) – at predictable prices.

A disorderly decoupling from fossil fuels could, therefore, deflate even developed economies that depend on their use and trade, and impact nuanced geopolitical equations.

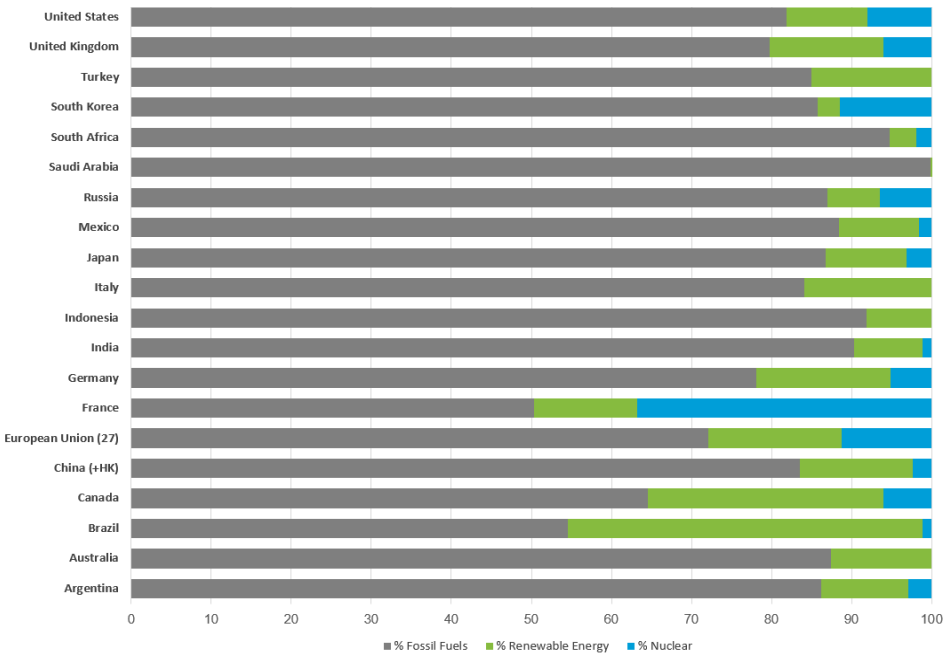
However, the imperative to lower emissions by reducing fossil fuel use is also urgent. The March 2023 update of the Intergovernmental Panel on Climate Change's (IPCC) Sixth Assessment Report reiterates the need to stop burning fossil fuels to limit global warming to 1.5°C (IPCC, 2023). One pathway calls for reductions in the global use of coal by 95%, oil by 60%, and gas by 45%, by 2050 – relying heavily on abatement technologies like carbon capture and storage (CCS), which are yet to demonstrate commercial viability at scale, to keep the reduction trajectory somewhat gentle.

The International Energy Agency (IEA) echoes this urgency. It projects that for the world to theoretically achieve net zero emissions (NZE) by 2050, the share of fossil fuels must drop to two-thirds of the global energy mix, and new low emission energy sources¹ equivalent to the entire energy supply added worldwide in the last 15 years be added, by 2030 (IEA, 2022).

The G20, with the exception of Mexico, have announced net zero goals, spread around the mid-century mark. These countries have options to reduce their fossil fuel footprints: retire existing plants and infrastructure or retrofit them with technologies to reduce emissions, avoid new projects, and scale up renewables like solar and wind. These measures, however, are limited to energy source replacement, and not removing fossil fuels from the economic structures of these countries.

It is therefore important to track how the G20 are managing their economic transformations towards a low-carbon future.

Figure 1: Total primary energy consumption of the G20 in 2021 (TWh).
Source: CEEW analysis; (BP, 2022)



A SECURE ECONOMY, OR NET ZERO? IT'S COMPLICATED.

A global transition to net zero could cost up to USD 9.2 trillion annually in just physical asset creation, adding up to USD 275 trillion by 2050 (McKinsey & Co., 2022). This entails an annual reorientation of 8% of global GDP (USD 97 trillion even in the pandemic-impacted year 2021 (World Bank, 2021)) toward decarbonization efforts – more than the 2022 US federal budget (US Treasury, 2022).

While most of the G20 have defined their net zero years, little light has been shed on how these mega-economies in-

tend to manage the total effort and cost of the transition, including associated financing, infrastructure creation, technology development and deployment, and socioeconomic transformations.

Even if we only take the energy transition component of net zero pathways, the scale, complexity and cost of the task appears Herculean for most G20 economies, which are defined by and bound to abundant oil, gas, and coal supplies, and meet over 80% (and in cases like Saudi Arabia and South Africa, over 90%) of their energy needs from fossil fuels (Figure 1).

Many G20 countries also depend heavily on fossil fuel revenues to finance their economies, balance trade deficits, and manage currency and inflation rates. This includes countries without substantial reserves, such as Australia and India, which usually import, refine, and export fossil fuels for profit.

For instance, oil rents contribute only 1.1% to Canada's GDP but comprise over a quarter of its exports. Even if Canada absorbs the cost of ceasing oil production, estimated at USD 53 billion in decommissioning and environmental compliance costs (Mawji, 2022), it would need to heavily invest in securing new commodities or products to make up for the export shortfall.

Stranded and decommissioned fossil fuel assets are also a major socioeconomic challenge. Australia could incur USD 39 billion in abandonment expenses by decommissioning about 65 offshore platforms and aged infrastructure and ceasing production at seven floating facilities by 2026 (Thomas & Milner, 2022). India needs USD 32–48 billion to decommission 130 coal plants (Singh & Shar-

»It is important to track the G20's economic transformations – beyond energy transitions – towards a low-carbon future.«

Figure 2: Fossil fuel economics in 19 G20 countries, excluding the EU.
Source: (World Bank, 2021)

Country	Oil rents as % GDP 2021	Fuel export share % 2020
Argentina	1.1	3.0
Australia	0.3	28.0
Brazil	1.8	14.0
Canada	1.1	26.0
China (+HK)	0.3	1.0
France	0.0	3.0
Germany	0.0	3.0
India	0.0	14.0
Indonesia	0.2	19.0
Italy	0.1	3.0
Japan	0.0	1.0
Mexico	1.4	6.0
Russia	6.1	43.0
Saudi Arabia	17.7	77.0
South Africa	0.0	9.0
South Korea	0.0	6.0
Türkiye	0.1	4.0
UK	0.3	8.0
USA	0.2	16.0

»The current G20 presidency being led by a troika of major developing economies presents a unique opportunity.«

ma, 2021), while Indonesia will need USD 37 billion to retire 118 coal units by 2040 (Garg, 2022).

A panicked transition to a low-carbon world by attempting to phase out fossil fuels without establishing alternate sources of incomes could also cost upstream oil and gas investors profits of USD 1.4 trillion. OECD-based investors could be hit with 57% of this loss, with their financial markets and governments, including pension funds, owning USD 385 billion and USD 484 billion, respectively, of these profits (Semieniuk, et al., 2022).

This sheer volume of investment is likely to leave governments, companies and individuals, including highly vulnerable retirees, locked into a fossil fuel-based future for now. While some studies peg returns on investment in renewables as higher compared to fossil fuels, long-term data is not yet available to prove a one-to-one replacement equivalence, especially of the various value chains.

ARE TAXES INCENTIVES? THE FISCAL CONUNDRUM OF FOSSIL FUELS

An initial thought was to reduce – and where possible, eliminate – inefficient fos-

sil fuel subsidies since they interfere with real energy prices by artificially lowering fossil fuel costs and making clean energy comparably more expensive. During the 2009 Pittsburgh Summit, the G20 agreed to rationalize, and eventually phase out, inefficient fossil fuel subsidies and redirect the freed funds toward social support through voluntary self-reporting, administered by a Review Panel and the OECD.

However, this has not yielded the envisaged results. Between 2017 and 2019, the G20 spent over half a trillion dollars (USD 584 billion) on average annually in “direct budgetary transfers and tax expenditure, price support, public finance, and state-owned enterprise investment to support production and consumption of fossil fuels at home and abroad,” almost half of which was allocated to oil and gas production. This, incidentally, was only a 9% average reduction over the 2014–2016 average, with about a third of the decrease coming from low oil prices (Geddes, et al., 2020).

Also, this reduction was not uniform across the G20, as Australia, Canada, China, France, India, Russia, and South Africa increased their support for fossil fuels (ibid). And after the COVID-19 pandemic hit in 2020, national recovery packages have channeled billions of dollars into oil and gas subsidies and tax breaks to maintain industrial competitiveness and shore up flagging economic growth (OECD, 2021).

The International Monetary Fund (IMF) theorizes that transitioning into a low-carbon future could be orderly and economically viable, and even growth-friendly, if countries adopt two levers – carbon pricing and green supply policies – as avenues to reduce the net economic impact of net

zero policies to near zero (Jaumotte, Liu, & McKibbin, 2021).

IMF’s projections rely on gradually phasing in carbon pricing² and offsetting the burden with public investment in clean energy infrastructure³ financed by government debt. It mathematically offsets the GDP lost due to the carbon tax-induced increase in cost of living and decrease in economic growth with the health co-benefits of lower emissions, propped up by cash transfers to support households.

Reality, however, rarely aligns with statistical modelling. Three key questions need answers:

1. Carbon pricing lacks broad public or political support even in advanced economies (Nowlin, Gupta, & Ripberger, 2020). Oil price hikes, as a fallout of the Russia-Ukraine conflict, led to protests and civil unrest in 92 countries in 2022 (Gebreab, Naadi, Sirilal, & Dale, 2022). Would the G20, mostly electoral democracies with stressed economies, further escalate the living costs of their citizenry?
2. Incremental steps are unlikely to lead to deep decarbonization. Sweden, an early adopter of carbon taxes in 1991, saw only a 6% drop in road transport emissions over 15 years (Andersson, 2019). In fact, gasoline and diesel vehicle registrations in Sweden have grown in recent years (Trafikanalys, 2017). Can carbon taxes, implemented incrementally over three decades, meaningfully contribute to the race to restrain global warming to 1.5°C?
3. Carbon taxes without directed expenditure and subsidy reform achieve little. India’s 2010 coal cess earmarked its proceeds to increase renewables,

but fossil fuel subsidies held firm at an annual USD 2.3 billion. In 2017, the coal cess was subsumed into the Goods and Services Tax and repurposed for broader developmental needs (IISD, 2018). At the global level, the Green Climate Fund (GCF) raised USD 10.3 billion to fund climate action in developing countries, but it is unclear if and how these funds were deployed. Why should the G20 bank on a mechanism without proven efficacy?

Carbon pricing could be tactically used to complement a portfolio of policies, including subsidizing and incentivizing technology and systems innovation, develop-

»Between 2017 and 2019, the G20 spent over half a trillion dollars on average annually to support fossil fuels.«

ment and even phase-outs (Tvinneim & Mehling, 2018). However, its influence on eliminating fossil fuels on time or in full is minuscule at best.

ALTERNATIVES TO FOSSIL FUELS? MOVING CLEAN TECHNOLOGIES FROM MINDS TO MARKETS

Transitioning from fossil fuels hinges heavily on technology. Limited grid access and unreliable power supply in develop-

»The world can only prevent warming to 1.5°C by reducing emissions by 43% by 2030.«

ing countries force people to burn coal and biomass, and use diesel generators. Despite reductions in the renewable energy generation costs, the sector remains constrained by its sources (amount and duration of sunshine, wind speeds, etc.), intermittency, and expensive storage technologies. Nuclear power is mired in political logjams and feedstock scarcity. Less than a dozen countries control critical minerals supply and processing capacities.

Industrial and transportation transformations need special attention. Energy-intensive and hard-to-abate sectors like fertilizers, chemicals, and iron and steel need cleaner alternatives, but with only 0.5 GW global electrolyser capacity (IEA, 2022), green hydrogen is still experimental. There is also no way yet to wean aviation and shipping off fossil fuels. Commercial shipping carries 90% of global trade, and most ships use heavy fuel oil, which is 30% cheaper than distillate marine fuels, and belch out sulfur oxide and other noxious emissions (Marine Insight, 2019).

Technologies are expensive to research and develop, and are aggressively guarded using legislation, patents and intellectual property rights. Technologies also must be customized to geographies, uses and users. At the February meeting

of the ETWG, the G20 strongly favored a citizen-centric energy transition, rather than a purely technocratic one, building on affordable energy access for all and increased industrial energy efficiency (PIB, 2023). Transition scenarios also need to include the high costs of technology and capacity building.

COULD A STRATEGIC ECONOMIC GROUPING JUMPSTART THE ENERGY TRANSITION? THE G20 ADVANTAGE

The G20 comprises a wide range of socio-political structures, strategic interests, resource capacities and developmental journeys, with myriad opportunities and challenges. But they all face grave climate-related economic and humanitarian risks as the world hurtles toward 3.2°C warming (IPCC, 2023), which could slash global GDP by 18% by 2050. While Brazil, India and Indonesia are among the most climate vulnerable G20 countries (Swiss Re, 2021a), the USA, UK and Canada could also lose 10% – and China, almost a quarter – of their GDPs (Swiss Re, 2021b).

The G20 has evolved beyond its economic agenda to address emerging intricate issues like agriculture, energy, environment, development, digitalization, education, health, culture, tourism and security. The interlinkages of global energy, commodity and services value chains need the G20 to strategically – and sensitively – collaborate to support each other's energy transitions and economic transformations, respecting national circumstances and priorities.

The G20 commands immense resources, holding most of the world's renewable energy and green hydrogen patents (Nurton, 2020) (IRENA, 2022). It also has 64%

of the vote share in Bretton Woods Institutions (IBRD, 2023) (IMF, 2023), which, if evolved to cater to modern financing needs and complexities, could be key to the global economic transformation.

Successful G20 summits have been led by plurilateral leadership (Bradford, 2022), with troika countries and their allies pooling ideas and efforts to drive ambitious agendas. The current G20 presidency being led by a troika of major developing economies – Indonesia, India and Brazil, followed by South Africa in 2025 – presents a unique opportunity to understand the nuances of transforming the lives and livelihoods of billions of people, often with meagre resources, by meeting their budding aspirations while transitioning their energy systems to lower the world's carbon footprint.

Indonesia's G20 presidency developed the decade-long Bali Energy Transitions Roadmap to accelerate the shift away from fossil fuels by prioritizing energy access, technology and finance (G20 Energy Ministers, 2022), but could not formalize it in a communiqué (Nangoy & Christina, 2022). The Indian presidency's development-oriented, climate-aware agenda anchored in the Sanskrit verse "Vasudhaiva Kutumbakam" – the world is one family – aspires to reinvigorate multilateralism, while its vision of LiFE: "Lifestyles for Environment" focuses on sustainable production and consumption and green development.

Today, the world can only prevent warming to 1.5°C by reducing emissions by 43% by 2030 (IPCC, 2023). Yet, the most compelling evidence of an abrupt drop in fossil fuel demand – the economically and socially devastating COVID-19 lockdowns – reduced emissions by only 12% in the US,

11% in the EU, 13% in the UK, and 9% in India (Jackson, 2020). The monetary, social and political risks and costs of trying to achieve climate goals by arbitrarily uncoupling from fossil fuels, without firmly establishing comparable global-scale alternatives – not only of energy systems but economic structures – must be comprehensively and pragmatically evaluated.

Foresighted domestic planning and global collaboration are essential to uncouple from fossil fuels in practical and socioeconomically viable ways. The G20 must re-evaluate their energy resources, markets and revenues to adopt a structured, long-term perspective to predict energy market shifts and climate risks to improve decision-making; plan unique transition pathways based on national circumstances and global imperatives; and partner with likeminded countries and organizations to help close resource, technology, finance and capacity gaps.

»The future of billions of people is at stake. The future is now.«

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¹ 125 exajoules, including bioenergy, solar, wind, and fossil fuels with CCUS, for a 50% reduction in their emissions intensity.

² Assuming that carbon pricing will trigger and additional 80% reduction in emissions reductions after stimulus measures are implemented.

³ Energy sources (primarily solar and wind, with some support for nuclear power) and sectors (transportation and services).