Powering the Future

Equitable Economic Strategies for a Globla Energy Transition

Brief for Policymarkers

BERGEN SUMMER RESEARCH SCHOOL

Despite growth in renewables, rising energy demands—especially in emerging markets—sustains heavy fossil fuel reliance. Supportive policies for clean energy and reform of fossil fuel subsidies are key. This policy brief outlines strategic shifts to accelerate the transition while addressing equity and climate resilience.

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Introduction

Climate change, driven by human-caused CO_2 and greenhouse gas emissions from the burning of fossil fuels, poses an existential threat to the planet. The Paris Agreement, adopted by 196 parties in 2015, aims to combat this by limiting global temperature rise to below 2°C, or ideally 1.5°C above pre-industrial levels.[1-2] Despite some attempts to curb emissions, none of the 30 major producers of oil and gas are aligned with the Paris goals, with fossil fuels continuing to be the foremost source of electricity globally.[3] The implementation of taxes on coal, oil, and gas production and carbon emission, can disincentivize their use. Complementing this, subsidies for sustainable energy sources, such as solar, wind, and hydropower, may encourage investment and development towards less environmentally disruptive alternatives.

However, it is crucial that economic measures are designed to be non-disruptive to national economies. This policy brief provides insights and recommendations regarding the appropriate implementation of taxes and subsidies based on available evidence to achieve an effective transition from fossil fuel to sustainable energy sources.

Key findings

Fossil Fuel Dependency

Despite the continued growth of renewables, which made up about one-third of global power generation, fossil fuels powered nearly 60% of global energy in 2024 (coal contributing 35%)[4]. Yet, rising energy demands from AI, cooling, and electrification are reinforcing fossil fuel reliance, particularly in emerging markets.

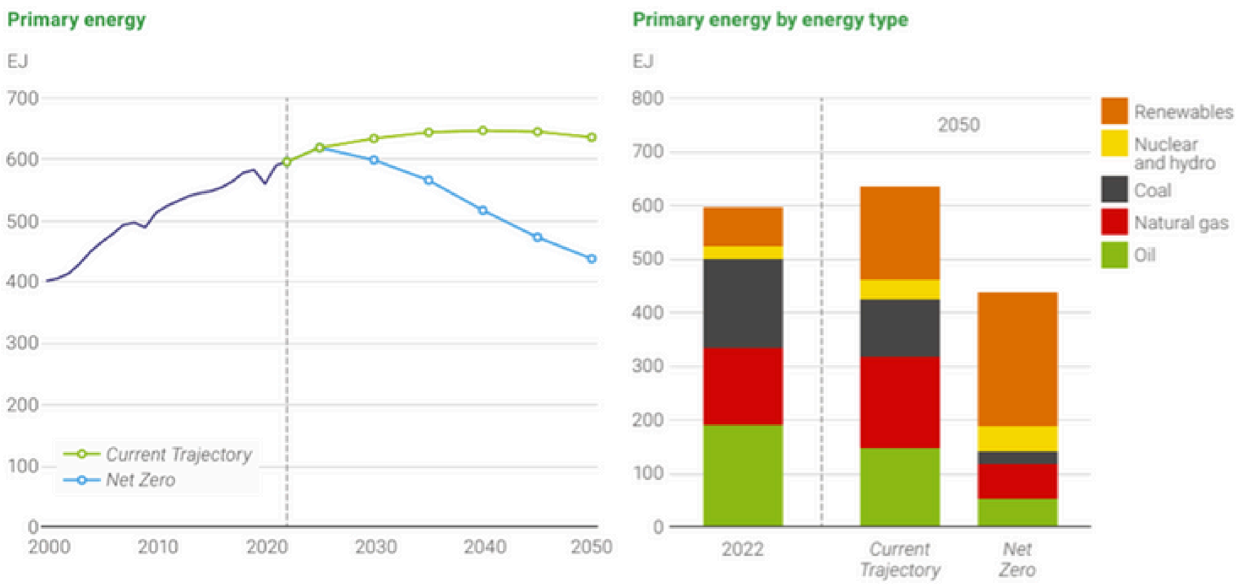

Figure 1. Primary energy demand projections (Bp, 2024)

Emission Sources

Coal is the largest emitter of CO_2 and greenhouse gases, producing roughly twice the amount of CO_2 per unit of energy compared to natural gas. Oil falls in between, emitting more CO_2 than gas, but less carbon-intensive than coal.

Carbon Tax

Carbon pricing, including carbon tax schemes, has reduced emissions by -5% to -21%, with a median annual reduction of -5% in high-income countries without harming the economy.[6-11] However, they can be regressive if implemented without targeted compensation for lower-income countries and households.[12]

Complementary Measures

The incentives-based approach rewards sustainable practices through tax relief, subsidies, and investment incentives.[13] Allocation of the carbon tax revenues to research, development, and deployment of clean energy technologies facilitates public acceptance.[14-15]

Distributive Justice

IPCC recognizes historical emissions as a justice concern but does not prescribe fiscal design.[16]

Taking this into account when implementing progressive taxation, polluters who have benefited from past emissions should be the first-movers in implementing and advocating for mitigative strategies, in accordance with the "Polluter Pays Principle" (PPP).[17]

IMPLEMENTATION CHALLENGES

Implementation challenges might include: political priorities, administrative processes, laws and regulations, public awareness and acceptance, and financial and technological concerns.[18] There are also issues of limited funding and adherence to the Paris climate agreements to reduce greenhouse gas emissions in the Middle East and the African region. [19]

RECOMMENDATIONS

- Implementing carbon taxes and cap-and-trade systems (limits on emission levels) to incentivize a reduction in fossil fuel extraction and use. [20]

- Removing subsidies for fossil fuels and redirecting them towards renewable energy can level the playing field and encourage investment in sustainable energy. [21]

- Increasing renewable energy adoption by setting ambitious targets and utilizing incentives and subsidies.22-23

- To promote equity, solutions need to incorporate a historical emissions-adjusted carbon tax. Revenues from this surcharge could be ring-fenced for financing mitigation and adaptation efforts in countries with low historical responsibility but high vulnerability.

Further relevant SDGs

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GLOBAL CHALLENGES

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SUSTAINABLE DEVELOPMENT GOALS

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