

FOSSIL FUEL SUBSIDIES AND THE PARIS AGREEMENT

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Overview

The topic of energy subsidy reform was placed on the international political agenda in 2009, when G20 leaders agreed to phase out fossil fuel subsidies over the medium term in their final communiqué of the summit in Pittsburgh.¹ Fossil fuel subsidies can be detrimental to societies in several respects. They incentivize greenhouse gas emissions, damage the environment, exacerbate congestion and other adverse side effects of transportation systems, impose large fiscal costs, and distort investment decisions in energy efficiency, renewables, and energy infrastructure. Furthermore, while energy subsidies are often implemented to secure affordability of energy by poorer households, they are in fact a highly inefficient way to support low-income households (Coady et al., 2015).

Raising fossil fuel prices towards efficient levels is thus a pressing issue for developed and developing countries alike. Yet still global energy subsidies are huge: Estimates for 2015 range from US\$ 333 billion to US\$ 5.3 trillion, which is equivalent to 0.4% and 6.5% of global GDP, respectively (Coady et al., 2017). The quite extreme range in the estimates for the volume of subsidies is due to differing definitions of what constitutes a subsidy. The OECD defines a subsidy as “any measure that keeps prices for consumers below market levels, or for producers above market levels or that reduces costs for consumers or producers”. The crucial question is the appropriate “market level” for energy prices. In a narrow sense – which leads to the lower estimate and is dubbed “pre-tax subsidy” in the literature – the appropriate reference is the supply cost, that is, cost of production, transportation and distribution of the energy good. For traded goods, the supply cost is usually measured by an international reference price. For non-traded products, it is the cost-recovery price. In a broader sense (dubbed “post-tax subsidy”), external costs of energy consumption – e.g. local pollution and contribution to climate change – are taken into account. That is, an externality that is not reflected in the price of the energy good is considered a post-tax subsidy.

In this article, we scrutinize the aspect that fossil fuel subsidies spur emissions of greenhouse gases and are at odds with goals formulated in the Paris Agreement 2015 to limit climate change.

We address two concrete research questions: (1) What are the welfare implications on the global and regional level of fossil fuel subsidy removal? We focus on market efficiency in a narrow sense and only consider pre-tax subsidies. (2) What is the impact of fossil fuel subsidies on the compliance costs associated with commitments under the Paris Agreement? Here we focus on medium-term reduction targets and distinguish between scenarios as defined by the nationally determined contributions (NDCs), and the 2 °C or 1.5 °C target, respectively. These scenarios are assessed with and without a removal of fossil fuel subsidies.

Methods

We base our assessment on a static multi-region, multi-sector computable general equilibrium (CGE) model building on the model developed in Böhringer et al. (2015). The CGE framework has a rigorous microeconomic foundation in Walrasian equilibrium theory which accommodates coherent global and regional welfare accounting of agents’ supply and demand responses to policy shocks. The model is parameterized with the GTAP database version 9, base-year 2011, as well as data on fossil fuel subsidies from OECD (2013), Clements et al. (2013), and Coady et al. (2017).

For a consistent assessment that allows us to isolate the effects of fossil fuel subsidies, we devise a business-as-usual scenario as follows: We compute an undistorted equilibrium by setting tax rates reported in the GTAP benchmark data to zero. Then we calibrate to the observed fossil fuel subsidy rates. All scenarios are assessed against the business-as-usual.

1 “To phase out and rationalize over the medium term inefficient fossil fuel subsidies while providing targeted support for the poorest. Inefficient fossil fuel subsidies encourage wasteful consumption, reduce our energy security, impede investment in clean energy sources and undermine efforts to deal with the threat of climate change.” (G20, 2009, p. 20)

Results and Conclusions

The research is ongoing. The core scenarios have been devised and the modeling work for scenario assessments is finished. The research will be concluded before the conference is due.

References

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