



CBB Book Review No. BR/21/1

Economic Instruments for a Low-Carbon Future

Edited by Theodoros Zachariadis, Janet E. Milne, Mikael Skou Anderson and Hope Ashiabor

Book Review Contributed by Shekira Thompson

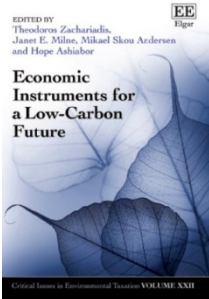
December 17, 2021

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Publisher: Edward Elgar Publishing Limited (2020)

ISBN Cased: 978 1 83910 990 4

ISBN eBook: 978 1 83910 991 1

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Economic Instruments for a Low-Carbon Future

Edited by Theodoros Zachariadis, Janet E. Milne, Mikael Skou Anderson and Hope Ashiabor

“Code red for humanity”² were the words heralded by UN Secretary-General Antonio Guterres on the heels of the latest Working Group report published as the first instalment of the Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report (AR6). The report is a chilling reminder that climate change is widespread, rapid and intensifying (IPCC, 2021). For Small Island Developing States (SIDS), climate change poses an existential threat despite these islands contributing the least to global greenhouse gas (GHG) emissions. The atmospheric concentration of carbon dioxide, the chief heat-trapping greenhouse gas, has resulted in unprecedented increases in global temperatures - the effects of which are already being felt worldwide through intense rainfall in some regions and severe droughts in others, persistent sea-level rise, and more frequent and intense storm activity.

With the growing global consciousness of the negative impact of human economic activity on the environment, the importance of economic instruments for environmental policy is emphasised in both the Rio Declaration of 1992 and Agenda 21. The book *Economic Instruments for a Low-Carbon Future*, thus represents a timely and relevant piece of work that documents and analyses country experiences with designing policies that attempt to adapt and mitigate the effects of climate change. As part of a more extensive series on critical issues in environmental taxation, the book provides valuable insights on the potential of environmental taxes and market-based instruments (MBI's) to expedite a feasible, cost-effective, and politically acceptable transition to low-carbon and resource-efficient societies.

The text is organised into five parts which assess themes related to recent developments in environmental taxation and legislation globally, as well as low-carbon strategies. Each part is further subdivided into individual essays on a topic related to the central theme of each section. Parts I and II introduce the reader to the debate surrounding taxes and subsidies in the energy generation and transport industries- the two most energy-intensive sectors. Parts III and IV present case studies on the evolution of low-carbon strategies in Australia and East Asia and the empirical modelling of decarbonisation policies, respectively. Part V concludes by addressing policy issues outside of low-carbon advancements in water pollution and biodiversity.

In efforts to mitigate the threat caused by generations of environmental exploitation, countries have begun to make concerted efforts to transition to more environmentally friendly societies. Using the European Union (EU) Renewable Energy Directive, known as RED II, the first two essays in the text reflect upon EU energy policy and their transition to low-carbon societies.

The RED II directive establishes a legal framework for promoting energy generation from low-carbon renewable sources to replace fossil fuels. According to the text, RED II defines economic instruments as:

² Taken from United Nation News article “IPCC report: ‘Code red’ for human driven global heating, warns UN chief” <https://news.un.org/en/story/2021/08/1097362>

“Any instrument, scheme or mechanism applied by a Member State...that promotes the use of energy from renewable sources by reducing the cost of that energy, increasing the price at which it can be sold, or increasing, by means of a renewable energy obligation or otherwise, the volume of such energy purchased...including those using green certificates, and direct price support schemes including feed-in tariffs and sliding or fixed premium payments.”

In compliance with the directive, EU Member States have enacted either one or more market-based instruments (MBI's). One such instrument is a price support scheme for renewable energy. Renewable energy support schemes (RESS) can take two forms: investment-focused or generation-based. Generation-based support schemes are most popular among member states and can be further classified into quantity and price instruments. Within a price support scheme, authorities set a price for energy from renewable sources and the market responds by adapting generation accordingly. These schemes usually include feed-in tariffs (FiT's), feed-in premiums, and net metering.

The authors suggest that instruments such as feed-in tariffs and net metering schemes play a valuable role in boosting investment in renewable energy technologies (RET's). By 2010, around three-quarters of the world's solar capacity was associated with FiT's (Couture et al., 2010). Of the Caribbean SIDS, countries such as Jamaica, Barbados, Grenada and St. Lucia have all implemented FiT's to varying degrees of success. Barbados, for example, has been able to increase their solar power capacity to 52 megawatts since the 2015 introduction of their scheme. According to the text however, FiT's have been critiqued for being market-distortionary instead of market-based in recent years. Since the FiT's maintain a fixed rate, they do not provide any incentive for renewable energy operators to respond to price signals in the electricity market, thereby preventing effective market assimilation between renewable and non-renewable energy prices. Nonetheless, where price instruments may have failed, quantity instruments could prove to be more effective in aiding the transition to more low-carbon societies.

Quantity instruments require that a minimum amount of energy be generated from renewable sources. The market determines the price based on the minimum quantity regulation targets. Examples of quantity instruments mentioned include tradeable green certificates, auctions and quotas. Unlike green certificates and quotas however, auctions cause a price decrease due to the competition among investors vying for the contract. These schemes have therefore gained popularity given their inherent advantage in minimising support costs and regulating the deployment of renewable energy and they have been implemented to varying degrees in 44 countries around the world (Lucas et al., 2013). After implementing green auctions in Brazil, the country was able to increase its RET deployment to 10 gigawatts (GW) in four years. Since auctions limit the risk to investors through guaranteed revenue over time in the form of long-term purchasing price agreements (PPA's), they could potentially represent a viable opportunity for SIDS constrained by size and diseconomies of scale.

The book also briefly touches on the implementation of environmental taxes and tax incentives in the transport sector and the issue of fairness. According to the authors, the transport sector accounts for one-fifth or 20 percent of all carbon dioxide (CO₂) emissions³ in the EU. Road transport makes up 17 percent while aviation accounts for the other 3 percent. Since

³ See page 48.

aeroplanes emit GHGs at higher altitudes, their net effect on climate change is proportionally higher than their share of emissions. Notwithstanding the negative externalities associated with air travel emissions being greater than that of land travel, it continues to be exempt from Value Added Taxation (VAT) in most EU member states. The authors argue that the lack of taxation effectively creates a competitive advantage for airlines and does not conform to the polluter pays principle⁴. Taxation of air travel is restricted by multilateral agreements such as the 1944 Chicago Convention⁵, the International Civil Aviation Organisation (ICAO) and bilateral agreements, but more so by the EU Tax Directive. This tax directive states that member states have to exempt certain transactions related to international transport on the supply side, but not on the tickets for passengers. They argue that the EU Tax Directive necessitates an amendment to put an end to the preferential treatment of the aviation industry and discourage air travel. It is worth noting, however, that other authors suggest that there is little evidence that taxing aviation leads to lower CO₂ emissions (Eurocontrol, 2020).

Some of the book's essays highlight the potential inequality and unfairness in taxation and incentivisation of electric vehicle use. Policies enacted by European countries such as Austria have seen the linking of VAT deduction thresholds to a vehicle's acquisition price. Therefore vehicles with lower price tags benefit from tax deductions while more expensive electric vehicles do not qualify. The author argues that linking the tax deductions to a car's value does nothing to influence the level of the vehicle's eco-friendliness but could potentially promote environmentally harmful choices.

Conversely, in Italy, officials introduced "Eco-bonus" and "Eco-tax" measures to promote the decarbonisation of vehicles. The eco-bonus is a tax incentive that aims to promote the purchase of low-emission or electric vehicles, while the eco-tax must be paid on the purchase of new high-emission cars. The authors argue that given the considerable price difference between high emission vehicles and electric vehicles, the eco-tax is likely to be paid by the poorer sections of Italian society. Unfortunately, the authors do not make any pronouncements regarding solutions to the inequity that could arise from the eco-bonus and eco-tax policies, but implementation of similar policies within the small island of Barbados could provide a feasible alternative.

With a population of around 287,000 persons, the island nation of Barbados is among the top users of electric vehicles per capita (Masson & Perez, 2021). As a part of the island's energy policy to encourage the decarbonisation of transport in the country, the excise tax rate on private electric vehicles (EV) ranges from 20 percent to 46.95 percent. In comparison, the excise tax rate on gasoline-powered vehicles ranges from 46.95 percent to 120 percent. In addition, all electric vehicles are exempt from the payment of road taxes, as this tax is applied to the price of gasoline and diesel. Therefore, the road tax becomes in effect a "carbon tax" that should cause users of combustion vehicles to internalise the negative externalities of fossil fuel usage throughout the lifetime of the vehicle's use. Arguably, the "carbon tax" like many other policies of this nature could inevitably place a disproportionate burden onto the poorer segments of society who cannot afford to make the switch to EV.

⁴ The polluter pays principle is the commonly accepted practice that those who produce pollution should bear the costs of managing it to prevent damage to human health or the environment.

⁵ This convention establishes rules of airspace, aircraft registration and safety and details the rights of the signatories in relation to air travel; it also exempts air fuels from tax.

In final analysis, the book missed the opportunity to highlight the perspective of developing countries. Developing countries are expected to contribute the greatest to emissions in the future as they continue to advance their economies (Kantha & Erickson, 2011). Even more so, SIDS stand to be the most impacted by the vagaries of climate change. Therefore, assessments of economic instruments and energy policies in these and other developing countries would have added to the general robustness of the text. Furthermore, inequity in environmental taxation continues to be a topic of debate within academic discourse. Though the book briefly touches on this issue, it does not address the topic in great detail. This therefore provides an area for further study by other researchers to delve deeper into the topic not only within the European Union context but in developing countries as well.

The book 'Economic Instruments for a Low Carbon Future' is a detailed and critical analysis of the potential of economic instruments to advance a low carbon transition. Through easily digestible language and practical real-world examples, it lends itself to be a useful resource for audiences who wish to learn about environmental policy instruments and their implications. For economists and policy makers, the ability of the authors to coherently contribute to contemporaneously relevant debates on the efficacy of economic instruments should prove interesting. Overall, the book is a commendable contribution to the field of environmental policy and will be a useful resource for years to come.

References

Couture, T. D., Cory, K., Kreycik, C., & Williams, E. (2010). A Policymaker's Guide to Feed-in Tariff Policy Design (NREL/TP--6A2-44849, 1219187; p. NREL/TP--6A2-44849, 1219187). <https://doi.org/10.2172/1219187>

Eurocontrol. (2020). Does taxing aviation really reduce emissions? <https://www.eurocontrol.int/sites/default/files/2020-10/eurocontrol-think-paper-taxing-aviation-oct-2020.pdf>

IPCC. (2021, August 9). Climate change widespread, rapid, and intensifying – Inter-governmental Panel on Climate Change (IPCC). <https://www.ipcc.ch/2021/08/09/ar6-wg1-20210809-pr/>

Kartha, S., & Erickson, P. (2011). Comparison of Annex 1 and non-Annex 1 pledges Under the Cancún Agreements. (Working Paper No. 2011–06; p. 21). Stockholm Environment Institute.

Lucas, H., Ferroukhi, R., & Hawila, D. (2013). Renewable Energy Auctions in Developing Countries (p. 52). International Renewable Energy Agency.

Masson, M., & Perez, L. C. (2021, August 16). Electrifying the Caribbean: Plugging in Electric Vehicles. Retrieved from IADB Blogs: <https://blogs.iadb.org/energia/en/electrifying-the-caribbean-plugging-in-electric-vehicles/>