

# Renewable Electricity Policy and Market Integration

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## Executive Summary

A cornerstone of energy policy in the European Union (EU) is to create a well-functioning internal market for electricity. Another fundamental objective is to transform the EU into an economy based upon a reliable and environmentally sustainable supply of energy.

To facilitate the transformation into a greener economy, the EU has imposed national targets for the renewable share of energy consumption, but delegates to the individual member states how to fulfil them. The EU member states have subsequently implemented policies to promote the generation of electricity from renewable energy sources, *RES-E*, to achieve their renewable targets

RES-E support mechanisms are now main drivers of investments in new generation capacity in many countries and thereby exercise a substantial influence over electricity prices. Price changes affect not only consumption and generation investment, but also the profitability of cross-border interconnections through the congestion rent network owners earn from buying electricity in one country and selling it more expensively in another. The cross-border interconnection capacity in turn determines the degree of market integration by restricting the volume of electricity trade between countries. Market integration, as measured by the volume of trade, and RES-E support mechanisms are therefore linked through the electricity market.

This paper builds a theoretical model of a multinational electricity market to explore the interplay between RES-E policies and market integration under decentralized policy making. A key finding is that the twin goals of increased RES-E production and market integration are mutually inconsistent when national policy makers act to maximize domestic surplus.

Governments can choose between a host of instruments to promote investments in renewable electricity: green certificates (also known as renewable portfolio standards), feed-in tariffs, investment support and taxes on electricity production from non-renewable energy sources, to name a few. This menu of instruments leaves ample room for national policy makers to pursue additional objectives unrelated to the official goal of increasing renewable electricity production. One possibility is to use RES-E schemes as substitute policies when trade agreements prevent policy makers from using tariffs and export subsidies directly.

National policy makers can increase surplus in an electricity importing country by introducing certificates or feed-in-tariffs which serve to reduce the import price of electricity. A corresponding production tax on non-renewable electricity production increases the export price of electricity and thereby domestic surplus in an electricity exporting country. A unilateral pursuit of such domestic RES-E policies decreases cross-border price differences, with negative consequences for congestion rent, transmission investment and thereby market integration.

A harmonization of and reduction in the number of policy instruments would reduce the risk of distortions under decentralized policy making by limiting the scope for pursuing ulterior motives. A particular promising strategy would be to follow the lead of Sweden and Norway and create an integrated market for green certificates. Trade in certificates increases efficiency by reallocating renewable investments to their most socially beneficial location.

Still, policy harmonization may be incapable of fully eliminating all distortions arising from decentralized policy making. If so, the observed differences in electricity prices across countries most likely underestimate the marginal social benefit of additional cross-border interconnections. In this case, subsidies to transmission investment at the central level are one way of increasing market integration and efficiency.