

# Linking an Emissions Trading Scheme with a Renewable Credits Market in Korea

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Korean government launched the Emission Trading Scheme (ETS) in 2015, which is a government-mandated market-based policy option to control greenhouse gas (GHG) emissions at the national level. The national target has been set as a 30% reduction of GHG emissions from BAU (business-as-usual) level by 2020 under the Framework Act on Low Carbon, Green Growth. The Renewable Portfolio Standard (RPS) which came into force in 2012 aims to increase the production share of renewable energy in electricity generation.

ETS allows companies to use offset credits generated from renewable power generations by up to 10% of total allowances, unless credits can also be used to comply with RPS in Korea. Therefore, even if two quantity-based regulation systems have different policy objectives, both mechanisms can be indirectly affected by credit conversions between the two, depending on their prices. This paper models an analytic partial equilibrium model and derives closed form market equilibria to demonstrate how the policies of one mechanism influence the other. This study mainly focuses on illustrating the interactions between the two regulatory markets as a consequence of changes in policy related to GHG regulation or RPS obligations. Furthermore, each system is administrated under different supervising agents, meaning that the decision of one regulatory agent may inadvertently affect the other's policy. Hence, it is necessary to pre-coordinate the effectiveness of the policy through this model.

We show that although any policy change would impact the same market directly incurring high price changes, the other market shows relatively small indirect responses in price. These unequal price responses from policy changes might give some comfort to policy makers unless they aim to influence the market they are not in charge of. Also, the calibrated results give policy implications on the degree to which the level of penalty and quota in carbon and renewable credit markets affects market participants' behaviour or prices. Policy makers can predict the effectiveness of regulatory changes across both markets through this model.

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