Abstract

Several tradable performance standard (TPS) programs have recently been implemented in the US transportation sector: regulations for greenhouse gas emissions from passenger cars and trucks (national), zero-emission vehicle programs (10 states), the Renewable Fuel Standard (national), and low-carbon fuel standards (two states). The primary motivations are to promote innovation, to address consumers' undervaluation of efficiency, and to reduce externalities, such as air pollution and the risks of dependence on foreign oil. A TPS sets a standard of technology performance but leaves technology choice to the producers; it increases the relative costs of technologies with undesirable performance characteristics and lowers the costs of technologies with desirable characteristics. We review the TPS programs and compare TPS with carbon pricing. Whereas carbon pricing creates incentives for both output reduction and technology change, TPS programs do not fully internalize the costs of emissions, resulting in lower price effects on products and raising the total cost of emissions reductions compared with carbon pricing. However, a TPS provides stronger incentives for upstream innovation and technology transformation. We show that TPS programs are generally additive to the effects of carbon pricing, so the policies can be combined without sacrificing the efficiency properties achieved by pricing. Given that the expected carbon price may be too low to substantially affect transportation demand or technology change, combining TPS with a carbon price may be necessary to drive innovation and achieve a sustained low-carbon transformation in the sector.

Keywords: policy instruments, transportation, performance-based standard, innovation, mitigation cost, complementary policy