

Can Voluntary Environmental Program Reduce Greenhouse Gas Emissions? An Analysis of the US DOE's Climate Challenge Program

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Abstract

This paper assesses the impact of the Climate Challenge Program (CCP), a voluntary environmental agreement (VEA) negotiated between the Department of Energy and the U.S. utility industry. The aim of the agreement was to reduce carbon emissions between 1994 and 2000. Our analysis involved a statistical study based on a panel data set composed of investor-owned power plants (n=358) for the 17 years from 1990 to 2006. The panel data analysis used a fixed effects model with a first-order autoregressive disturbance, an approach which handles both self-selection and serial correlation. The analysis shows that the impacts of the CCP varied over different performance measures and different time periods. During the program's operational period, the CCP significantly induced fuel switching but did not reduce CO₂ emissions per unit of net generation (CO₂ intensity). Afterwards, CCP members were more likely to fuel switch and lower CO₂ intensity. However, the total plant emissions of CCP members continuously increased during the program's operational period, and in the period afterwards. This mixed pattern of results has policy and methodology implications. The policy implication is that voluntary programs, which by design do not impose emissions caps, may have some success in achieving some performance objectives, such as reducing emissions intensity, without reducing overall emissions levels (relative to the emissions baseline at the start of the program). The methodology implication is that a precise assessment of voluntary programs has to consider a time horizon that extends beyond the program's operational period, and also consider range of performance measures. This conclusion is especially relevant for VEAs whose participation metrics include capital investments, or whose programmatic design involves information exchange components with possibly longer-lasting effects, and for programs whose participation metrics are flexible enough to have multiple effects which can only be captured by different performance measures.