Executive Summary

Evaluation of Efficiency Activities in the Industrial Sector Undertaken in Response to Greenhouse Gas Emission Reduction Targets

Lynn Price, Stephane de la Rue du Can, Hongyou Lu
Energy Analysis Department
Environmental Energy Technologies Division
Lawrence Berkeley National Laboratory

Arpad Horvath
Department of Civil and Environmental Engineering
University of California-Berkeley

Background

In 2005, Governor Schwarzenegger announced greenhouse gas (GHG) emission reduction targets for California which call for reducing emissions to 2000 levels by 2010, to 1990 levels by 2020, and to 80% below 1990 levels by 2050. The 2020 targets were included in the California Global Warming Solutions Act of 2006. The California Air Resources Board (ARB) has been given the tasks of adopting a statewide GHG limit for 2020 equivalent to 1990 emissions and to adopt rules, regulations, and market-based compliance mechanisms for achieving the maximum technologically feasible and cost-effective GHG emissions reductions.

Meeting the California Global Warming Solutions Act 2020 target will require action from all sectors of the California economy, including industry. The industrial sector consumes 25% of the energy used and emits 28% of the carbon dioxide (CO_2) produced in the state. Many countries around the world have national-level GHG reduction or energy-efficiency targets, and comprehensive programs focused on implementation of energy efficiency and GHG emissions mitigation measures in the industrial sector are essential for achieving their goals. A combination of targets and industry-focused supporting programs has led to significant investments in energy efficiency as well as reductions in GHG emissions within the industrial sectors in these countries.

Methodology

This project has identified program and policies that have effectively targeted the industrial sector in other countries to achieve real energy and CO_2 savings. Increased energy efficiency and reduced GHG emissions can also lead to cost savings and improved competitiveness for industries, reduced emissions of other air pollutants and particulate matter, reduced water consumption, reduced production of waste and improved product quality. This report characterizes the industrial sector in California and describes GHG emission reduction voluntary agreement programs in five countries that have manufacturing sectors that are relatively similar to those found in California.

Result

Voluntary agreement programs can be roughly divided into three broad categories: 1) programs that are completely voluntary, 2) programs that use the threat of future regulations or energy/GHG emissions taxes as a motivation for participation, and 3) programs that are implemented in conjunction with an existing energy/GHG emissions tax policy or with strict regulations. A variety of government-provided incentives as well as penalties are associated with these programs.

Voluntary agreements are "essentially a contract between the government and industry, or negotiated targets with commitments and time schedules on the part of all participating parties" (IEA, 1997). These agreements typically have a long-term outlook, covering a period of five to ten years, so that strategic energy-efficiency investments can be planned and implemented. A key element of voluntary agreements is that they focus the attention of all actors on energy efficiency or emission reduction goals.

Programs in Ireland, France, The Netherlands, Denmark, and the UK were chosen for detailed review. These programs fall into all three categories of voluntary agreements and have a number of interesting features. The report found that the surveyed countries that have national-level policies aimed at the reduction of GHG emissions all developed comprehensive programs to engage the industrial sector in identifying and implementing energy efficiency and GHG emission reduction technologies and measures. Even though the approaches differed by country and each country engaged a diverse range of industrial sub-sectors, the results of most of these programs were impressive. Some programs realized energy savings in the range of 3% to 8% per year and most companies engaged in the programs either realized or surpassed what were initially perceived to be ambitious savings targets.

The five agreement programs reviewed in this report represent very different overall approaches. Four of the five programs were established by the government in support of overall energy efficiency or GHG emissions reduction goals. The fifth, the AERES program in France, was an industry-driven program that was established with the motivation to proactively avoid government-imposed carbon taxes. The Dutch LTA programs also provided industry with the reassurance that if they participated in the agreements they would be not be subjected to additional regulatory requirements, including energy or CO_2 taxes. Participants in both the Dutch LTAs and the UK CCAs were given special treatment regarding environmental requirements typically imposed on large industries. In the Netherlands, companies were given an expedited environmental permitting process while in the UK compliance with environmental permits was granted automatically if the CCA targets were met by a company.

Conclusion

Despite the programmatic differences, some key elements in most of the programs appear to have provided industry with the structure and support needed to accomplish, and often exceed, the programmatic energy-saving or emissions-reduction goals. These key elements include required company commitments to sign energy-saving or emissions reduction target agreements, to undertake energy audits, develop energy action plans, and implement energy management programs; monitoring, reporting and verification requirements; and

supporting government programs that provided participating companies with information on energy-efficient and GHG mitigation technologies and measures, provided resources and tools, established information-sharing platforms, provided energy audits, and provided financial incentives and support.

Despite initial concerns voiced prior to the establishment of these programs, assessments show that they often were responsible for increasing the adoption of energy-efficiency and GHG mitigation technologies beyond what would have been adopted without the programs.

Based on the international experience documented in this report, it is recommended that companies in California's industrial sector be engaged in a program to provide them with support to meet the requirements of AB32, The Global Warming Solution Act. As shown in this review, structured programs that engage industry, require members to evaluate their potential efficiency measures, plan how to meet efficiency or emissions reduction goals, and provide support in achieving the goals, can be quite effective at assisting companies to achieve energy efficiency levels beyond those that can be expected to be achieved autonomously. Thus, a program that is carefully designed with clear guidelines, specific monitoring, reporting, and verification protocols, and especially robust supporting programs to assist California's manufacturers to identify and implement energy-efficiency and GHG emissions mitigations technologies and measures could be designed to compliment AB32 and increase the energy-efficiency and competitiveness of California's industries.