

Lessons From Across the Pond

As Congress struggles with a climate change bill and EPA attempts to put together a program via rulemaking, the United Kingdom notches more than a decade of experience in managing greenhouse gas emissions. Two consultants who helped lead the process, including integration into the EU Emissions trading System, offer insights into the shape of a U.S. trading program

Robert Bell
Daniel Waller

While the United States has been debating the details surrounding the regulation and management of carbon dioxide and other greenhouse gases, governments and industries in Europe have been monitoring, reporting, and regulating their emissions for more than a decade. Efforts to create a mandatory emissions reduction scheme in the United States that is robust and effective could be well-served by taking into account several significant lessons learned from similar experiences in the European Union.

As readers may be aware, disparate country level data and first-time rulemaking problems led to some systemic failures in the implementation of the first phase of the EU's Emissions Trading System regarding data accuracy and forecasting, which a U.S. program would do well to avoid. In addition, the UK government's experiences as a country-level participant in the ETS and, prior to that, in imple-

menting national emissions reduction programs offer insight into the processes of collecting data and negotiating emissions targets with industry.

The landmark 2007 U.S. Supreme Court case *Massachusetts v. Environmental Protection Agency* confirmed EPA's authority to regulate carbon dioxide (and other harmful gases) under the Clean Air Act. Soon thereafter Congress authorized the agency to publish a rule that would require the collection of industry data in support of domestic climate change mitigation policy. With EPA's mandatory Greenhouse Gas Reporting Rule in effect as of January 1, the agency is taking its first steps toward regulating GHGs.

The data collected under the rule will likely feed into the baselines and targets used for those sectors that will be covered under the American Clean Energy and Security Act or equivalent legislatively passed cap-and-trade program. The current bill would establish the United States' first cap-and-trade system for carbon dioxide, with graduated reduction goals of 3 percent in 2012, 20 percent in 2020, and 83 percent in 2050. More than 10,000 domestic power facilities, manufacturers of motor vehicles and engines, and suppliers of fossil fuel and industrial chemicals will incorporate GHG emissions accounting into the management and evaluation of their operations under the reporting rule. These facilities, which account for over 85 percent of U.S. global warming emissions, will be required to address all six of the GHGs included under the Kyoto Protocol, not just carbon dioxide.

In addition to the cap-and-trade program that would be implemented under the current legislative draft, other possibilities for domestic policy include the introduction of a carbon tax or regulation of car-



Robert Bell is Chief Technical Officer of AEA Technology, a UK-based consultancy that has been at the forefront of implementing emissions reduction pro-



grams in the European context. **Daniel Waller** is Carbon Management Practice Leader, Project Performance Corporation, part of the AEA Group. Other contributors to this article include Alex Beehler, Independent Consultant, PPC, and Avril David, Energy and Environment Analyst, PPC.

bon dioxide and other GHGs under EPA's Clean Air Act authorities. For any legislation or regulation that is considered, there would likely be court challenges; although these would delay implementation, they would likely not deny it. Regardless of which option is taken, any delay will be a friend for getting the underlying data, incentives, and system mechanisms as accurate and as well-designed as possible.

The present U.S. experience in confronting GHGs can be best compared to the experience of the United Kingdom in the period leading up to the Kyoto Protocol. Already having developed a National Atmospheric Emissions Inventory, in 1994 the UK became the first country to promulgate a climate change program. The system included strategies for market mechanisms, regulations, and agreements designed to mitigate global warming. After 37 industrialized countries signed the protocol in 1998, other EU countries mostly for the first time began to focus seriously on how to monitor and reduce their GHGs to meet the EU's target of an 8 percent reduction below 1990 emissions levels by 2012. The UK's contribution to this target — in addition to serving as a role model — was to reduce its national emissions by 12.5 percent, for which it set out on an ambitious emission reduction program including a tax, the Climate Change Levy. That is where we entered the scene.

e UK's Climate Change Agreements

In 1999, AEA Technology, a global climate change consultancy based in the United Kingdom, was appointed as the government's advisor to resolve the intricacies of the Climate Change Levy, a tax on gas, coal, and electric utilities (there was an existing tax on oil), which went into effect in 2001 and resulted in a 10–15 percent increase in energy bills of households and affected firms. Energy-intensive industries such as paper, steel, and ceramics were concerned about the tax's effect on their competitiveness. In order to address those concerns, the UK offered companies rebates of 80 percent on the tax if they voluntarily signed up to long-term energy saving targets called Climate Change Agreements, or CCAs. The UK selected AEA as the facilitator of negotiations between government and industry, and AEA was tasked with formally recommending which challenging but achievable and cost-effective targets should be set for each sector, as well as providing the rationale behind those targets.

AEA then facilitated CCA development and recommended targets for industry associations. Once the industry sector targets were set, individual associations

had the responsibility to divide up the targets among their member companies. In essence, there were two levels of agreements — one between the government and each industry association and another between industry associations and each of their member companies. The agreements between the government and the associations served as a template for the agreements made between the associations and their members. In order to be included in the agreements and hence receive the levy rebate, companies had to be a part of an industry association — this actually served to simplify and facilitate the process — and industry associations had incentive to encourage the agreements, given the potential for an increase in their membership.

The negotiations consisted of two phases. The first was designed to determine the form that the agreements would take and the second was designed to establish the quantitative targets. From 1999 to late 2000, the rules of the agreements were negotiated, with plenary meetings between AEA, industry associations, and the UK government approximately every two months. The process consisted of drafting a position paper, followed by one month of discussion and review and then the submission of updated proposals. There were additional meetings between just AEA and the associations in order to facilitate the process and clarify key issues.

Once the rules of the agreements had been determined, AEA, industry, and the government negotiated the targets in those pacts. Meetings with each of the sectors for the target phase took place roughly every month for about six months. By 2001, 44 energy-intensive sectors had accepted CCAs, with target reviews required in 2004 and 2008. Crucial to the accords was a provision for a mechanism which would allow participants to trade allowances within their industries.

Once the targets had been negotiated, AEA was called before the UK Parliamentary Environmental Audit Committee as a witness to present the results of the talks. Although some committee members believed that the targets were so harsh as to cripple the UK economy, AEA showed that the final targets were only a percentage of each industry's potential cost-effective emissions savings.

At the outset of the process, some associations attempted to use the media to undermine the process. This disruption was short-lived, however, as the government made it clear that negotiations toward these accords would proceed. In addition, as these were voluntary, non-binding agreements, there was no formal alternative mechanism through which industry associations could oppose the pacts and the negotiation

process and thus otherwise qualify for the 80 percent rebate from the levy.

Several other stakeholders were present at the plenary meetings, including the UK Environmental Agency, the Department of Trade Industry, the Confederation of British Industry, Her Majesty's Revenue and Customs (as the eventual collectors of the levy), and the Treasury.

Six years after the implementation of the levy, during one of the required biannual reviews, it was discovered that industry had actually overachieved and outperformed the CCA targets. The goals that were met were the same ones that AEA had determined as most cost-effective at the outset of the negotiations. Many industries found that in reducing emissions, they were actually able to improve their bottom lines. An important lesson was learned: if targets are established bearing the long term view and keeping the path of industrial progress in mind, they have every chance of working and benefiting industry in the process.

Establishing a long-term target allows industries time to make adjustments according to normal business cycles. Each industry's trajectory will be different. For instance, the food and drink industry in the UK had much low hanging fruit for energy savings through behavioral changes and replacing common equipment such as motors. However, in other industries, such as cement, there is very little flexibility for making changes in daily operations or in the near term. Rather, policymakers must ensure that cement kilns are replaced during their normal life cycle (every 10 to 15 years) with the most efficient units on the market. While a cement company may have to pay somewhat more to purchase a high-efficiency kiln instead of a standard model, it is not being asked to bear the full financial brunt of a premature replacement.

Getting businesses to admit that they are more capable of achieving the targets than they realize is an important challenge in achieving reductions in industrial emissions. For instance, in AEA's negotiations with one major UK business sector in early 2000, industry representatives claimed that there would be no conceivable technology improvements to help the industry lower energy use. However, general historical trends since the industrial revolution show that over time business achieves efficiency improvements continuously, as science and technology progress. In the CCA negotiations, AEA made it clear while it could not predict exactly what those improvements would be, there would be cumulative efficiency enhancements to the industry over the long term to meet ambitious targets. Part of the challenge was getting industry to think likewise and plan accordingly. Due to the initial success of the CCA system, the UK decided to extend the program to 2017, and AEA remains heavily involved in

the review and recasting of the agreements for the next phase.

e EU Emissions Trading Scheme

Soon after the Climate Change Agreements were implemented in the United Kingdom, an EU Directive was developed that allowed each country (including the UK) a timeframe (from 2002 to 2004) for planning its country-level emissions cap and allocation plan for incorporation into a EU-wide Emissions Trading Scheme.

During that timeframe, AEA was tasked with assisting the UK in designing its National Allocation Plan and ensuring data quality across multiple data sets. In working toward establishing a NAP, the UK was able to build on its extensive experience in negotiating with industry, as well as use the data collected from both its National Atmospheric Emissions Inventory and the Climate Change Agreements. As the CCAs were already in place by the time work on the EU ETS had begun, some of the AEA staff who had worked on the CCAs were used to develop the UK's NAP, thereby facilitating consistency of data. While some countries' NAPs were very generous and lenient toward industry, the UK's was fairly stringent given its previous experience with the CCAs as well as its access to more streamlined and accurate emissions data from the implementation of other environmental initiatives.

Also during this time, AEA was selected to work with the European Commission, the executive arm of the EU, to assist with policymaking for the ETS. AEA helped the EU with cost-benefit analysis of including different sectors and different gases beyond carbon dioxide. Instrumental to this work was AEA's previous experience managing the CCAs.

The first phase of the EU ETS was implemented in 2005 and ended in 2008. In Phase I, 95 percent of emission allowances were allocated, with just 5 percent auctioned, to meet each country's individual emissions cap. The EU directive that established the scheme required that "at least" 95 percent of all allowances were to be given away for free. Most member states gave away the full 100 percent, based on available emissions data. Four member states (Denmark, Ireland, Hungary, and Lithuania) chose to auction modest amounts of allowances (some 4 million metric tons of CO₂ in total) in this phase. The logic in providing mostly free allowances was to preserve industrial competitiveness through minimal costs to participating businesses. The potential to auction a small amount was included to allow member states to experiment.

Phase I of the system covered 15,000 installations across 27 countries, representing 46 percent of rel-

evant emissions in the EU. The system applied solely to some industrial sectors and electricity production and covered exclusively carbon dioxide emissions from combustion and some industrial processes. It did not include the other five greenhouse gases listed in the Kyoto Protocol.

Systemic Failures Become Apparent

By the end of Phase I, some considerable systematic failures became apparent. First, the data used among the EU member countries (excluding the UK and some others) were of uneven quality. Many countries greatly overestimated their emissions. Data gathering by a number of member states proved inadequate compared to the many years of audited data that the UK gleaned from the CCAs and the production of the National Atmospheric Emissions Inventory (also an AEA-managed project).

As a result of these inaccuracies, after the EU ETS went into effect in 2005, carbon prices crashed when most regulated entities found that they had no need to engage in trading. The data and price difficulties experienced in the ETS demonstrate that an emissions trading system must be based on consistent and integrated emission data. To date, reporting of GHG emissions in the United States has been done primarily on a voluntary basis or through more recent initiatives such as the 10-state Regional Greenhouse Gas Initiative. Although the U.S. national inventory is of high quality, to set individual sector allocations more disaggregated, bottom-up data are needed. The House-passed energy and climate bill now before the Senate draws on a 2005 baseline from EPA's National Inventory, a top-down assessment that relies on fuel consumption and energy use to generate emissions data for various industries. In order to create an effective system, methodologies used for estimating emission will have to be harmonized, data gaps will need to be addressed, and research will be required to fill these gaps.

In addition, a set of metrics will need to be developed to measure the success of the data-management efforts. The ability to forecast accurately will depend on predictive data that take into account industry restructuring, relocations, and economic circumstances and impacts. This is particularly challenging in a quickly shifting economic climate. In addition, forecasting will require consideration of the mix and maturation potential of new alternative energy sources. As drafted, the Senate bill projects a carbon price of \$13–17 per ton of CO₂ equivalent in 2015, and \$17–22 per ton of CO₂ equivalent in 2020. A key assumption in the bill is that U.S. emitters will have access to the purchase of international offsets for GHG emissions. For this as-

sumption to work, the United States must ensure that its trading system is compatible with other trading systems, both domestic and international, and that U.S. emitters are able to communicate with participants in other cap-and-trade systems internationally, using common data sets, common emissions units, and similar criteria for the quality and reliability of offsets.

Second, the use of a free allocation method in the EU ETS was problematic. The method did not reward early action, and in general, requires some element of data integration (to generate accurate forecasts) and presents a real risk of over-allocation if caps are not set correctly. Auctioning at least some allowances provides a more stable price signal, creates a stronger incentive to make emission reductions, rewards early action, and offers a high level of transparency.

Third, it is important to remember that although market-based mechanisms are designed to deliver the required result at the lowest cost to society, imperfect market design can lead to undesirable outcomes. In Phase I of the EU ETS (2005 to 2008), the prices crashed due to inaccurate country level data and subsequent failures in price forecasting. During Phase II (2008 to present), prices crashed again as a result of significantly lower industrial emissions caused by a decline in industrial activity during the global recession. Hence, some government regulation of the market is essential to ensuring that the environmental objectives of the scheme are met; for instance, the possibility of implementing price floors in the EU ETS is now under consideration.

Though each country will have to develop an emissions trading scheme and complementary policies that work within its own specific social, economic, and political context, there are certain issues that are inherent to the design of an emissions trading scheme that must be considered by any country seeking to reduce its GHGs. The U.S. system for this is currently fragmented, with varying standards, targets, and timeframes across states and regions, with some voluntary reporting systems that have been in place for a number of years. Ultimately, the United States will need to issue federal reporting regulations, and voluntary state and federal emission data sets and methodologies will need to be reconciled with federal rules.

The Environmental Protection Agency's mandatory greenhouse gas reporting rule is a step in the right direction, but other key details must also be addressed in order to prevent the same mistakes that were made in the European Union. Determining how data will be collected and managed in order to inform the emissions trading scheme and ensuring efficient and effective design for policies that complement market mechanisms will be keys to success as the United States moves forward on climate change policy. •