

# **THE EFFECTIVENESS OF VOLUNTARY PROGRAMS AND NEXT STEPS IN CLIMATE CHANGE POLICY**

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## **Introduction**

This paper addresses two key questions related to the development of climate change policy in the United States.

1. Will voluntary programs to be sufficient to address climate change?
2. Should the next step of climate policy be to develop a comprehensive, economy-wide greenhouse gas target and policy or a set of carbon limits and approaches that are tailored to key individual sectors?

The paper reviews and assesses the effectiveness of a decade of voluntary actions in the United States to reduce greenhouse gas emissions. It concludes that voluntary programs to reduce greenhouse gas emissions are extremely helpful, but of limited effectiveness in the face of a rising tide of greenhouse gas emissions. By themselves, they are not adequate to significantly reduce greenhouse gas emissions in the short or the long term. In the next phase of climate action, the United States will need a policy that includes at least some mandatory requirements to reduce greenhouse gas emissions.

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Second, it explores opportunities that policy makers, especially in Congress, are working on that could lead to new policies to reduce greenhouse gas emissions. It concludes that strategies that are tailored for key sectors in the United States that produce or absorb greenhouse gases – electric utilities, buildings, transportation, industry, forestry and agriculture – are more likely to be adopted before a comprehensive, economy-wide limit on greenhouse gases, such as the Kyoto Protocol contemplates.

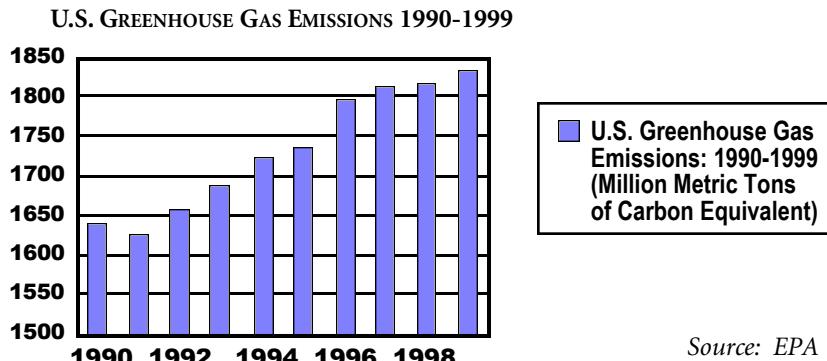
### **The Role of Voluntary Efforts**

The United States has spent much of the last decade engaged in voluntary efforts to reduce greenhouse gas emissions, both internationally and domestically. This history provides a rich basis for analysis, and for consideration of the advantages and disadvantages of voluntary measures. Many of the voluntary programs initiated in the last decade are run by the federal government, and involve government agencies providing technical assistance and recognition to companies and organizations that are taking actions to reduce greenhouse gas emissions. In the last several years, a number of non-profit organizations have also launched their own voluntary reductions partnership programs with the business community. Some companies have also acted independently.

As the descriptions of these programs indicate, they have succeeded in making some reductions. Despite this effort, however, overall U.S. emissions have increased from 1,648 million metric tons carbon equivalent (MMTCE) in 1990 to 1,840 MMTCE in 1999, an 11.7 percent increase. In 1996, the government anticipated a reduction in greenhouse gas emissions from its voluntary programs of 76 MMTCE – a figure many considered optimistic and well short of the 200 MMTCE that would have been needed to return emissions to their 1990 levels as called for under the Rio Treaty.

The government's most successful program – the Energy Star label – can claim reductions, but overall emissions within the residential and commercial building sector increased substantially during the 1990s.

The Clinton Administration never developed formal projections of what level of reductions from voluntary programs could be anticipated in meeting the projected targets. The most optimistic informal projections ranged as high as one



third of the needed reduction that could be met through voluntary programs, and many analysts believed it would be much lower.

#### *Green Lights Program*

The Environmental Protection Agency (EPA) launched in 1991 the first voluntary program aimed at reducing greenhouse gas emissions with the creation of the Green Lights program. This program was designed to encourage companies and other organizations to install more energy efficient lighting, thereby reducing both energy costs and greenhouse gas emissions. This program is now a part of the broader Energy Star program for buildings.

#### *The Energy Star Label*

The Department of Energy (DOE) and the EPA created the Energy Star label for energy efficiency to assist consumers in identifying the most energy efficient home appliances, office equipment and other products. Energy Star products are significantly more efficient than required under DOE's energy efficiency standards for appliances. For example, refrigerators, central air conditioning systems, and furnaces exceed existing federal standards by a minimum of 10 percent, 27 percent, and 15 percent respectively.

The program appeals to consumers' pocketbook interest as well as their environmental commitment. The program estimates that the average annual home energy bill in the U.S. is \$1,300, and that a typical household can cut that bill by about 30 percent by choosing products with the Energy Star label.

The program has been very successful in expanding use of the label. As of July 2000, 1,600 companies manufacture 11,000 product models with the Energy Star label. More than 550 retail companies promote products with the Energy Star label in more than 7,000 storefronts. Consumers can find the label on more than 30 product categories, including:

- Home appliances such as refrigerators, dishwashers, room air conditioners, and clothes washers.
- Home electronics;
- Office equipment (computers, monitors, printers, scanners, fax and multi-function machines, and copiers);
- Heating and cooling systems;
- Residential lighting, including compact fluorescent light bulbs and indoor and outdoor fixtures; and
- Windows, doors, and skylights.

The use of the label has also been expanded to include the most energy efficient residential and office buildings.

According to EPA, more than 5,500 businesses and organizations have upgraded their facilities for a net energy savings of \$1.5 billion in 2000, 25,000 Energy Star homes have been built and more than 520 buildings have earned the Energy Star label.

These programs – the Energy Star label for products and buildings and the Green Lights program – reduced greenhouse emissions in 1999 by 10.2 MMTCE. However, from 1990 to 1999 emissions attributable to electricity demand from the residential and commercial buildings sector increased by more than 200 MMTCE, an increase of 12.3%.

#### *Climate Change Action Plan*

In 1993, the Clinton Administration launched the Climate Change Action Plan aimed at meeting the target of the 1992 Rio Treaty on global warming – reducing emissions to their 1990 level by 2000. This program contained many new initiatives to reduce greenhouse gas emissions, especially voluntary programs to partner with business to reduce emissions. In addition, the plan dramatically

expanded the existing Energy Star program, as well as existing research and development efforts for clean energy technologies at the Department of Energy.

Among the new programs commenced as part of the Climate Change Action Plan were new voluntary partnerships with the electric utility, aluminum and natural gas industries. These programs are successful efforts that have engaged large numbers of participants in these industries in efforts to reduce greenhouse gas emissions, and more information is provided here about them to provide a sense of what the programs are capable of doing.

#### *Climate Challenge*

Many electric utilities are participating in Climate Challenge, a voluntary program created by the Department of Energy to reduce greenhouse gas emissions. As of June 2000, 124 electric utilities and their subsidiaries, representing 71% of 1990 electric generation and utility carbon emissions, were participating in the program. DOE estimates participants will reduce carbon emissions by over 47.6 MMTCE in the year 2000. However, this includes reductions made outside the United States and reductions that can also be counted as part of the Energy Star program. The Natural Resources Defense Council estimated that all electric utility companies reported domestic reductions of 42.4 MMTCE in their most recent reports to the Energy Information Agency. Despite these reductions, overall emissions of greenhouse gases from the electric utility sector rose more than 11% from 1990 to 1999.

#### *Voluntary Aluminum Industrial Partnership*

To reduce emissions of perfluorocarbons (PFCs), EPA launched the Voluntary Aluminum Industrial Partnership (VAIP). The Aluminum Association created a PFC Task Force, and developed a VAIP framework that includes company-specific emissions reduction targets and annual reporting of the progress toward achieving the targets. Eleven of the nation's 12 primary aluminum companies, 22 of the nation's 23 smelters and 94 percent of the nation's production capacity are participating in the program. This program has succeeded in helping the aluminum industry lower PFC emissions by 48% through 1999 – equal to reducing carbon emissions by slightly more than 2 million metric tons annually.

*The Natural Gas STAR Program*

The Natural Gas STAR Program is a voluntary partnership between EPA and the oil and natural gas industry. Through the program, EPA works with companies that produce, process, transmit and distribute natural gas to reduce emissions of methane, a potent greenhouse gas. By eliminating leaks in their systems, the companies both reduce emissions of methane and improve their profitability.

More than 90 companies are participating in the program, and 11 major industry trade associations have endorsed it. According to EPA, since 1993, partners in the program have eliminated more than 120 billion cubic feet of methane emissions and saved \$360 million. The methane reductions are equal to removing more than 9.5 million cars from the road for one year or planting 14.5 million acres of trees.

*Non-Profit Voluntary Programs*

In the past few years, several non-profit organizations have initiated their own voluntary programs and have established partnerships with industry. The World Wildlife Fund, for example, has launched its Climate Savers program, in which Polaroid, IBM, and Johnson & Johnson have committed to an overall greenhouse gas reduction goal. Johnson & Johnson pledged to reduce its global warming emissions worldwide 7 percent below 1990 levels by 2010, while IBM plans to achieve average annual CO<sub>2</sub> emissions reductions equivalent to 4 percent of the emissions associated with the company's annual energy use through 2004 from a baseline of 1998. Polaroid will cut its carbon dioxide emissions 20 percent by 2005 compared to 1994 levels, and 25 percent by 2010.

Environmental Defense has created a Partnership for Climate Action with BP, Shell International, DuPont, Suncor Energy Inc., Ontario Power Generation, the Canadian aluminum company Alcan, and the French aluminum company Pechiney. Each company has set a target for greenhouse gas reductions. According to Environmental Defense, the targets will result in a collective annual reduction of at least 80 MMTCE by 2010. The electric utility Entergy has also committed to work with Environmental Defense to stabilize its emissions and reduce them further beyond 2005.

The Pew Center on Climate Change has created a Business Environmental Leadership Council to which 36 companies now belong. Council members believe enough is known about the science and environmental impacts of climate change to take action to address its consequences, and are committed to taking steps in their U.S. and international operations to reduce their greenhouse gas emissions. While no specific reduction commitment is expected to join, many are making significant reductions.

The World Resources Institute (WRI) and Business for Social Responsibility (BSR) and eleven leading industries have committed to develop corporate markets for 1000 megawatts of new “green” energy capacity over 10 years. They have formed the Green Power Market Development Group to support the development of green energy markets, because such markets are essential to provide competitively priced energy that also protects the Earth’s climate and reduces conventional air pollutants. The eleven companies collectively account for about seven percent of industrial energy use in the United States.

#### *Other Voluntary Actions*

Recently, a number of automobile companies have made voluntary commitments to reduce emissions from their fleet of automobiles that they sell. In 2000, both Ford Motor Company and General Motors pledged to reduce emissions from their fleets of Sport Utility Vehicles by 25% by 2005. This action is likely to have significant impact on greenhouse gas emissions because light trucks, including SUVs, represent more than 50% of new cars sold in the United States.

### **Voluntary Programs Helpful**

Voluntary programs have many benefits, and have been particularly useful during the first decade of action on climate change in the United States. Participation in a voluntary program has been a helpful educational tool for government, industry, and others. These programs have been especially effective at identifying successful approaches for motivating action, as well as successful approaches for making reductions. This base of experience about where emission reductions can be found and at what cost provides an important resource for all participants as we move towards the next phase of emission reductions. Moreover, they create a sense of optimism that more can be accomplished.

Some key programs appear highly effective, such as the Energy Star label and Voluntary Aluminum Industrial Partnership. The former is an effective consumer education tool, influencing millions of consumer transactions. The latter appears to be effective because it occurs in a sector that is highly concentrated economically with a high participation level, and companies must report their total emissions of the targeted greenhouse gas, perflourocabons. These factors eliminate many of the features that undermine the effectiveness of voluntary efforts.

It is hard to make an accurate estimate of the total reductions achieved by all programs, and the government does not do it for its programs. However, in 1996, the government anticipated a reduction in greenhouse gas emissions from its voluntary programs of 76 MMTCE – a figure many considered optimistic and well short of the 200 MMTCE that would have been needed to return emissions to their 1990 levels as called for under the Rio Treaty.

While it is highly likely that some of the emission reduction claims of the proponents of voluntary programs are over-estimated, it is probable that these efforts have stimulated some level of reduction, so the environment is better off as a result of these programs.

### **Weaknesses of Voluntary Approaches**

On the other hand, voluntary programs have substantial weaknesses that make them only a partial solution to efforts to solve climate change. While it seems likely that emissions in 1999 were lower than they might otherwise have been because of voluntary efforts, these efforts are being swamped in a rising tide of growing emissions. The voluntary reductions are selective and do not tell the full story. The numbers of importance to the climate are total emissions, which are rising. In essence, the current system suffers from having too few volunteers. When the nation has too few volunteers to fight a war, it must adopt a mandatory military service requirement. In the effort to stem greenhouse gas emissions, the nation must move to a system of mandated reductions.

Despite almost a decade of significant public and private efforts towards voluntary reductions in the United States, emissions of greenhouse gases rose 11.7 percent from 1990 to 1999, or an average annual increase of 1.2%. These figures will be higher after data for 2000 are finalized. In key sectors, the story is much

the same. From 1990 to 1999, greenhouse gases emitted by electric utilities increased by 11 percent, while emissions from the transportation sector went up 18%, according to EPA's most recent national inventory.

In addition, we cannot be assured that the reductions that are described in various voluntary programs are new and additional reductions or would have happened anyway due to other factors. Both DOE and EPA admit that double counting and other accounting problems are possible and could reduce the amount of reductions that are new and additional. If voluntary programs include significant quantities of "anyway" tons, then the value of these programs would be significantly diminished.

These results are not surprising. With a system based on voluntary reductions of greenhouse gases, government has sent no strong and deliberate price or regulatory signals into the marketplace that would lead to fundamental change in corporate or consumer policies or to stimulate demand for cleaner technologies. In today's market, greenhouse gas emissions have no cost. Thus, all actors – business, governments, other organizations and individuals – only do those things that it makes economic sense to do anyway. An investment to reduce greenhouse gas emissions must be weighed against all other investments that have benefit to the firm, and greenhouse gas reductions have little or no value other than their public relations or learning benefits.

Moreover, those making the investments to reduce greenhouse gas emissions may not accrue the benefits of those reductions. Reduced greenhouse gas emissions lower the risk to society of global warming, and not the firm. Government action is needed to ensure that those societal benefits are captured through investments in cleaner technologies.

## The Next Phase of Climate Change Action: Economy-wide or Sector-based Strategies?

Voluntary programs have made a useful, but not sufficient, beginning to efforts to address climate change in the United States. Policy makers must consider what approaches should and could be taken in the next phase.

Many have argued that the U.S. should develop a strategy aimed at reducing greenhouse gas emissions across the economy. The Kyoto Protocol generally contemplates an economy-wide reduction in greenhouse gases. Several analysts at Resources for the Future, for example, have urged that the U.S. develop a broad-based emissions trading program limiting greenhouse gas emissions associated with all energy. However, such comprehensive systems – the “Top Down” approach – are extremely complex and difficult for policy makers in government to understand and adopt. While the business community may find them easy to understand, they are distant from the specific issues that they may confront in managing climate change and other environmental issues. They are also difficult for the general public to grasp.

Instead, strategies that are tailored for key sectors in the United States that produce or absorb greenhouse gases – electric utilities, buildings, transportation, industry, forestry and agriculture – are more likely to be adopted before an economy-wide limit on greenhouse gases. As 80% of U.S. greenhouse gas emissions result from the combustion of fossil fuels, sectors that produce or consume energy will be particular targets for action. Emissions from fossil fuel combustion increased 13% from 1990 – 1999, and account for the majority of U.S. emission increases, according to EPA. Electric utilities produce 29% of all greenhouse gases, much of it to power residential and commercial buildings. The transport sector produces 27% of all emissions.

If we examine only carbon dioxide emissions, key end-use sectors are:

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| • Residential and Commercial Buildings | 35% |
| • Industry                             | 31% |
| • Transportation                       | 32% |

Within transportation, gasoline accounts for 60% of emissions. EPA also estimates that if electricity production at industrial facilities is included, then electricity production is responsible for 40% of carbon dioxide emissions.

Significant attention is already being devoted in Congress and among business and environmental leaders to sector-specific proposals including:

- An integrated strategy for reducing several pollutants from the electric utility sector, tax incentives for clean electricity, and a mandate for a portion of electricity produced to be from renewable energy.
- Tax incentives for energy efficient residential and commercial buildings.
- Tougher fuel economy standards and tax incentives for more fuel efficient cars.
- New and expanded programs in farm legislation to promote carbon sequestration in agriculture.

This “Bottom Up” strategy of creating sector-specific policies has several advantages over the “Top Down,” comprehensive approach.

First, it makes the problem seem more manageable and the specifics of what is actually being asked of business and other actors are easier for all to grasp. An emission target for the electric utility industry or a fuel economy requirement for the automobile industry is easier to understand and assess than a requirement that U.S. emissions should be reduced overall, with all industries contributing in some fashion. In imposing limits, policy makers prefer the certain and the known over the ambiguous and unwieldy.

Second, the Bottom Up approach offers the opportunity to smoothly integrate solutions to climate change with other national interests, such as air quality, consumer protection, mobility, the need for increased and diversified farm income, and national security.

Consideration of a multi-pollutant reduction strategy for electric utilities has advanced significantly because it proposes to combine consideration of climate change with other pollutants and requirements in the Clean Air Act, thus creating an opportunity to significantly rationalize current air quality requirements. The current debate on energy policy is raising both risks and opportunities for climate change policy. Consumer concern about volatile prices, new technological developments, and long-standing national security concerns about imported oil are leading to pressure on Congress to consider a range of policies that will have an impact on greenhouse gas emissions.

As Congress rewrites the nation's farm legislation in 2002, policy makers are looking for opportunities to stimulate more actions that could lead to greenhouse gas reductions such as storing carbon in soils, building windmills on farms, and requiring the use of biomass – a fuel with virtually no impact on the climate. But this altruistic concern about the environment is also backed by a fundamental worry about the state of the agricultural economy, and a demand for new and diverse sources of farm income. The Bottom Up approach means that measures that integrate these two concerns can be enacted in the short term.

Congressional reauthorization of the nation's major highway and public transportation law, due in 2002, presents a similar opportunity to meld policies that promote mobility, reduce and diversify energy use, and reduce emissions of greenhouse gases and other air pollutants.

Finally, the Bottom Up approach relies on a diverse package of policy tools – funding, tax incentives, and regulation – to change investment in technology and practices, while the Top Down approach relies largely on a strong price signal as the only tool that can stimulate change. While the U.S. experience with high energy prices in the 1970s demonstrates that price signals will be extremely effective in stimulating change and leading to reductions, policy makers will be extremely cautious about overtly adopting that approach. They may fear, for example, an American public that is upset about paying higher gasoline prices when more fuel-efficient vehicles that meet their needs or the infrastructure for alternative fuels are not available.

The Bottom Up approach also has its weaknesses. First, adoption of sector-specific policies may inhibit the smooth development of an effective greenhouse

gas trading market, thus undermining the efficiency of efforts to reduce greenhouse gas emissions. Under this approach, utility companies may be required to reduce emissions, for example, but may not have the option of pursuing more cost-effective reductions by trading with an automobile company.

Second, if different approaches are adopted for different sectors, it may be hard to assess whether the overall plan treats each sector fairly.

Despite these concerns, policy makers are highly likely to develop sector-specific strategies to address climate change. The challenge will be to marry the advantages of the sector-based policy making for greenhouse gas reductions with the substantial benefits of emissions trading.

Thus, the next serious stage of climate policy development will be to go beyond voluntary measures and to examine mandatory strategies, coupled with other measures that work in specific sectors to reduce emissions.