

CHAPTER 9

POLICY RECOMMENDATIONS

Introduction

Two sets of policy recommendations are provided in this Chapter. In Part I are those policy initiatives required to facilitate the range of measures to reduce greenhouse gas emissions and/ or enhance sink capacity applied in the sector-by-sector analysis conducted for this Action Plan. It is intended that these policies are sufficient to deliver the individual measures identified in the Action Plan. These policies are necessarily general in scope and are appropriate for the range and scale of responsibility to be experienced by state government agencies, industries and non-government organizations. In some cases, existing Delaware policies are identified as providing a basis for emissions reduction/sink enhancement, but needing strengthening in a specific manner to ensure their efficacy. Policies identified in Part I are designed to ensure that the measurable benefits of sectoral measures are achieved within the Action Plan's timeframe.¹

Part II provides a set of policies considered to be important by the DCCC in achieving emission reductions/sink enhancement, but are not necessarily linked to specific quantifiable steps to reduce or store CO₂ or other GHGs. These policies have not been systematically assessed against the cost-effectiveness criteria applied to the measures in the Action Plan. Further, these policies may not necessarily deliver the anticipated benefits in the timeframe applied to the policies in Part I, i.e. some or all of these policies may only be capable of delivering medium or long-term benefits.

¹ In accordance with the goals and scope of this Action Plan, as described in the Introduction, there are no recommendations regarding the implementation of these policies. Implementation issues are to be addressed in Phase III of the U.S. EPA Climate Change Action Plan Initiative.

Part I. Policies to Achieve Action Plan Goals and to Implement Action Plan Measures.

Industrial Sector

1. Provide incentive programs for industrial efficiency upgrades.

There are a variety of state and federal policy measures, which have proved to be effective in promoting high-efficiency technology choices in the industrial sector. Two policies are recommended for action in Delaware.

Tax incentives for high-efficiency industrial lighting

Delaware (as well as the federal government) can support the introduction of high efficiency lighting by providing limited tax credits to offset the higher purchase price of more efficient lighting. Rebate programs in partnership with electricity providers and lighting service companies can also be promoted through state programs modeled after USEPA and USDOE initiatives (described below).

Accelerated depreciation of capital investments in specific technologies

State tax policy should be reviewed for the purpose of incorporating provisions for accelerated depreciation of capital investments in specific high-efficiency technologies for energy-intensive industries. Key technologies would include cogeneration, motor systems, HVAC equipment, compressed air technologies and boiler and steam systems. Targeted tax credits would have the effect of accelerating market penetration of energy efficient equipment that improves the productivity of Delaware's industries.

2. Promote auditing and benchmarking, especially for small- and medium-scale industries

The U.S. Department of Energy has supported an energy assessment service for several years that targets small- and medium-scale industrial facilities. Through a

partnership with universities, the USDOE program has identified a wide range of highly cost-effective operations and maintenance procedures and technology upgrades to improve energy efficiency in industrial facilities. Implementing such efficiency strategies has environmental benefits while also improving the competitiveness of area industries. Delaware should participate actively in this program. Analyses performed for the Action Plan indicate that significant reductions in CO₂ emissions are possible with an approach that focuses on cost-effective measures for Delaware's small- and medium-scale industries.

3. Increase Delaware's participation in existing voluntary programs.

Several USEPA- and USDOE-sponsored voluntary programs to promote industrial sector efficiency in energy and materials use deserve active support of Delaware's state and local governments. Five are highlighted below.

Climate Wise (USEPA)

The Climate Wise program provides information and assistance on a range of emission reduction opportunities at industrial facilities. Companies are encouraged to reduce emissions by measures such as altering production processes, switching to lower carbon content fuels and renewable energy, implementing employee mass transit, and auditing systems to identify efficiency improvements. Currently, Delaware is only modestly active in this program.

Industrial Assessment Centers (USDOE)

The university-based Industrial Assessment Center (IAC) program conducts assessments throughout the country using established engineering measurement methods as the basis for recommendations for facility improvements. These recommendations focus on potential savings from energy efficiency improvements, waste minimization, pollution prevention, and productivity improvements for small- and medium-scale industrial facilities. At this time, Delaware is not actively participating in this program.

Steam Challenge (USDOE)

The U.S. Department of Energy's Steam Challenge develops public-private initiatives to promote the comprehensive upgrade of industrial steam systems wherever profitable. By communicating with industry to identify useful tools and information on more efficient steam use, the program aims to lower energy costs, reduce pollution, and improve competitiveness through technology upgrades and better facility management. Delaware is moderately active in this program.

Motor Challenge (USDOE)

USDOE's Motor Challenge promotes energy efficient electric motor systems; motor systems account for 75% of the electricity used in industry. The aims of the program are to increase the use of efficient motors and drive systems, improve industrial competitiveness and productivity, save energy, and decrease industrial waste and pollution. Delaware is active in this program, but it could expand participation to include the development of an annual inventory of industrial motors in the state (by type and size).

Compressed Air Challenge (USDOE)

The USDOE Compressed Air Challenge is a voluntary program designed to improve the energy efficiency of compressed air systems and promote the installation of energy efficient compressors systems. Delaware is not actively participating in this program.

Residential Sector

1. Raise energy-efficiency standards for buildings and appliances

By raising energy-efficiency standards to a higher level, existing energy demand can be reduced, resulting in economic savings to Delawareans and reduced greenhouse gas emissions. These include standards for building design, insulation, construction materials, and major residential appliance energy use (e.g., refrigerators, air conditioners,

and water heaters). Research indicates that higher efficiency standards are one of the most effective policy tools for encouraging economical energy use in the residential sector.

2. Promote wide participation in Federal programs for residential energy conservation and greenhouse gas emissions mitigation.

Examples of existing federal programs that promote residential energy conservation and efficiency include: the Energy Star Program (U.S. Environmental Protection Agency); Energy Improvement Mortgages (through the Federal Housing Administration); and the Home Energy Rating System and the Energy Efficiency Financing Consortium (U.S. Department of Energy). Such programs bring together public and private sector organizations to develop information and marketing strategies to increase market penetration of high-efficiency technology into the residential sector (as well as to other energy users).

3. Provide incentives to switch from electric to natural gas space and water heating where possible, or switch to higher efficiency electrical appliances.

Space and domestic hot water heating are major sources of energy use in most Delaware homes. Electric systems generate more greenhouse gas emissions than comparable natural gas units. Switching from electricity to natural gas for water heating lowers overall emissions attributable to the sector. Where electricity customers have no access to natural gas, higher-efficiency electrical appliances should provide these services. A variety of economic incentives, such as rebates, can assist consumers by reducing the effective purchase price of higher efficiency gas or electric water heaters. State and federal tax policy can include rebates to consumers and vendors for equipment purchased/sold above a designated efficiency standard. In the electricity sector, distribution charges can be adjusted to take into account the energy efficiency of users. A similar approach can be taken in the case of the natural gas sector.

4. Improve product information so that consumers can choose energy-efficient appliances.

Assisting consumers in making decisions to save energy and reduce greenhouse gas emissions in their energy-related purchases can be achieved in several ways. These include: energy labeling, customer information supplied by retailers and utilities, advertising and other communication strategies. When energy-inefficient equipment needs to be replaced, appropriate advice and labeling can help consumers identify those higher efficiency models with low operating costs. Switching from electric stoves to those using gas, when possible, typically is also an economically and environmentally sensible choice.

5. Promote the use of cost-effective, energy-efficient lighting.

A range of high energy-efficiency lighting is available, but market penetration remains relatively low, partially due to higher initial prices compared to traditional products. Considerable potential exists for increasing market penetration by encouraging consumers to replace lighting fixtures with high-efficiency options (e.g., compact fluorescent lighting). Delaware and federal tax policy can support the introduction of high efficiency lighting by providing limited rebates to mitigate the purchase price of more efficient lighting.

Commercial Sector

1. Encourage the use of cost-effective and energy-efficient lighting through commercial sector lighting standards.

Lighting is a principal energy user in the commercial sector. Establishing higher energy-efficiency standards for commercial lighting is a cost-effective means of lowering CO₂ emissions. The added benefit of increasing lighting efficiency standards is that it

would promote rapid development and diffusion of new technology including high-efficiency fluorescent lamps, ballasts, lighting fixtures, and lighting control switches.

2. Promote wider use of natural gas for heating, ventilation, and air conditioning systems (HVAC).

Because electricity is typically a greater source of CO₂ emissions than natural gas, using this energy source (when available) can result in significant reductions in CO₂ emissions for this sector. A variety of policy instruments can be employed, but standards and market incentives (especially tax credits and rebates) are typically most effective.

3. Encourage the use of more efficient refrigeration technologies.

Considerable potential exists for upgrading refrigeration technology in Delaware's commercial sector with more energy efficient models at the time of equipment replacement or retirement. With the use of more efficient technologies, specifically those technologies with an energy use index (EUI) of 2.0 kBtu/f² or greater, emissions from refrigeration in the sector could be much lower. Incentives, such as tax credits and rebates, can be used to spur market development of this key technology.

4. Encourage building-integrated photovoltaics.

One important opportunity for reducing energy use and greenhouse gas emissions is the application of photovoltaic (PV) technology to buildings to reduce electricity demand. The National Renewable Energy Laboratory has sponsored research at CEEP on the CO₂ effects of a national strategy to provide 2% of national buildings-related electricity consumption from photovoltaic systems. This work is in anticipation of national electricity restructuring legislation, which could include a so-called renewable energy portfolio requiring electricity providers to generate a specified percentage of their electricity from renewables. PV systems can be installed on rooftops or other suitable locations and incorporated into commercial building energy systems, and thereafter

operated as a peak management technology. This application has proved to be cost-effective if it is combined with emergency power applications to permit orderly shutdown of computers and other equipment in commercial buildings.

A building-integrated PV program can also be encouraged through the Environmental Incentive Fund. This Fund was recently established in Delaware as part of legislation to promote retail competition in the electricity sector.

5. Promote wide participation in Federal programs for commercial sector energy conservation, renewable energy use and other actions to reduce greenhouse gas emissions.

Apart from the specific policies recommended above, there are several federally sponsored programs available to the commercial sector to assist in the development of its use of energy conservation and renewable energy and other initiatives that can lower CO₂ emissions. Examples include the USEPA's Energy Star Buildings and Green Lights programs, Energy Star Small Business Program and Energy Star Product Labeling, and the USDOE's Rebuild America Program. Both agencies have found that considerable energy and cost savings and CO₂ emissions reduction can be realized in the commercial sector from these voluntary partnerships between private and public sector organizations.

Transportation Sector

1. Increase CAFE standards for vehicles.

The use of more fuel-efficient vehicles will reduce CO₂ emissions per vehicle mile traveled. Some of the policies aimed at increasing fleet fuel-efficiency in Delaware will require federal leadership. For example, corporate average fuel economy (CAFE) standards must be implemented on a federal level. CAFE standards determine the average minimum fuel efficiency for all new cars sold in the U.S. CAFE standards have not been raised for light duty cars or light duty truck since 1989 and 1995 respectively.

As a consequence, U.S. new vehicle fuel efficiency has begun to plateau. Federal action to increase CAFE standards will promote fuel efficiency and encourage the rapid introduction of new technology.

2. Provide incentives for the purchase/sale of fuel-efficient vehicles.

Feebates are market-based incentives designed to increase energy-efficiency and which can also reduce CO₂ emissions. The basic concept is to award a rebate to consumers buying fuel-efficient vehicles, and to charge a fee to consumers buying fuel-inefficient vehicles. Such an incentive would result in higher sales of fuel-efficient vehicles, leading manufacturers to produce more fuel-efficient vehicles in subsequent years. Feebates may be implemented on a statewide basis, although their effectiveness would improve if they were implemented on a national scale. Another method for improving fuel efficiency would be state-sponsored buy-backs of older vehicles. In this program, Delaware would purchase inefficient, highly polluting vehicles with the assumption that they would be replaced by cleaner, more fuel-efficient vehicles.

3. Use statewide mandates and market mechanisms to encourage the adoption rapid penetration of Alternative Fuel Vehicles.

The adoption of AFVs will be dependent on the use of market-based incentives and statewide mandates for the purchase of AFVs. California's current AFV program is a good example of a statewide mandate. This program requires 10% of all new vehicles purchased in the state to be zero emission vehicles (ZEVs) by 2004. Delaware could adopt a similar plan and join the northeastern states and Washington D.C. in the National Low Emission Vehicle (NLEV) program.

Market-based incentives can be used to make AFVs more cost-competitive. The costs to the consumer of purchasing an AFV could be defrayed directly by rebates or indirectly by tax incentives. Such incentives will stimulate the market for AFVs, thereby increasing sales and leading to further economies of scale in their manufacture. A

doubling of the market for AFVs could lead to a 15% reduction in their price. Delaware could also subsidize part of the construction costs of AFV infrastructure, such as CNG refueling stations and battery recharge facilities.

While the Electricity Policy Act (1992) promotes alternative fuel vehicles in public and private fleets, it has yet to influence private fleet fuel use, making the full implementation of the Act a candidate for future policy activity.

Delaware should support the adoption of a wide array of AFV technologies. For example, support of electric vehicles (EVs) should extend to battery-powered EVs, hybrid EVs, and fuel cell EVs.

4. Reduce vehicle miles traveled (VMTs) by adopting policies to implement transportation control measures.

Reducing VMTs by using transportation control measures (TCMs) presents the widest array of options to Delaware policy makers. TCMs can be effective on a local or statewide basis. Although most TCMs can be implemented by individual employers on a local scale, statewide policy implementation or funding is usually needed to initiate their widespread adoption. For example, a state partnership with employers to reduce single occupant vehicle (SOV) employee travel by a specified percentage will spur the creation of area-wide ridesharing programs. Although all TCMs are dependent on policy formation, they can be divided into three basic categories: employer-based initiatives, facility improvements, and market mechanisms. Employer-based initiatives include the promotion of telecommuting, compressed workweek, and area-wide ridesharing. Facility improvements include High Occupancy Vehicle (HOV) lanes and public transit improvements. Market mechanisms include parking pricing, congestion pricing, gas taxes, and pay-as-you-drive-insurance. All of these TCMs will require a commitment to new policies in Delaware and at the national level if they are to produce substantial reductions in CO₂ emissions.

5. Develop policies aimed at changing land use patterns.

Land use changes will not have a large impact on transportation systems or CO₂ emissions within the short term. However, over longer time spans, land use changes aimed at creating denser, mixed-use settlements may offer important opportunities to reduce transport energy intensity and CO₂ emissions.

Land use and travel behavior are integrally linked. The typical suburban development that characterizes northern Delaware increases the demand for new roads and highways. This process of development, often referred to as sprawl, intensifies automobile use and discourages the use of less polluting alternatives such as public transit, bicycling, or walking.

Policies that promote coordination of land use and transportation to reduce energy use and CO₂ emissions from the transportation sector include tax measures, impact fees and new zoning ordinances, and statewide growth management planning. Growth management enhances the effectiveness of different means of transportation by shaping land use patterns to foster fewer trips, shorter trip distances, and alternatives to automobile use (CEEP 1994 and 1996). Higher density, greater functional diversity, and pedestrian/bicycle friendly design have, in combination, the potential to reduce automobile dependency, lower VMT per capita, and reduce CO₂ emissions. Thus, appropriate land-use changes are integral to vehicular CO₂ emission reductions over the next several decades.

Electric Utility Sector

1. Undertake fuel switching from high to low carbon fuels.

Changing the fuel used within an existing generating plant can be achieved by altering or replacing existing equipment. One specific generation unit was identified as a primary candidate for fuel switching because repowering from coal to natural gas would

involve only relatively minor alterations. National cost estimates indicate a relatively low level of expenditures required (Department of Natural Resources 1994). Fuel switching at this single plant will produce significant carbon reductions from this sector because of the amount of fuel involved. The State of Delaware should work with Conectiv to plan the conversion of the power plant already identified by the utility for fuel switching.

2. Develop and implement a renewable portfolio standard.

Delaware should, through legislation or regulatory action, implement a renewable portfolio standard, mandating that a minimum 1% of the electricity in the State must be generated from a portfolio of renewable sources as listed in this section. Technologies which could be utilized to meet this standard include: photovoltaics, solar thermal technologies, wind power, fuel cells utilizing hydrogen produced from renewable sources, or sustainable biomass. Coupled with the recently established Environmental Incentive Fund, this policy can help Delaware to be competitive in attracting so-called “green” energy marketers to the State. Since New Jersey has moved aggressively to develop its green energy market, policy action in this direction would be a timely step to promote Delaware as a competitive location for this fast-growing market.

3. Investigate a regional environmental dispatch policy.

It is recommended that relevant Delaware agencies in consultation with Conectiv initiate a regional consultative process for the investigation of environmental dispatch criteria and procedures to be followed by the PJM Independent System Operator. Implementation of environmental dispatch criteria would provide long-term CO₂ emission reductions, as well as regional air quality benefits. The state public utility commissions of both New Jersey and Maryland have expressed concerns that differential emission standards across the Mid-Atlantic region may threaten air quality as electric generation markets are deregulated. The implementation of environmental dispatch operational criteria is one way in which these concerns might be addressed in a

restructured, competitive market, while also substantially aiding Delaware in meeting the CO₂ reduction target of this Action Plan.

4. Investigate state emission standards for electricity generation facilities.

Delaware should investigate the adoption of an emission standard for the State's portfolio of electric generation units. This standard could be implemented utilizing the "bubble model," whereby electric generation within the state would be limited to a certain system emission factor. This would entail a cap on the overall emissions of CO₂ per unit of electricity generated within the State. Such a standard would be relatively simple to implement as the vast majority of installed capacity is owned and operated by a single investor-owned electric utility. The implementation of a system-wide average emission factor would encourage the implementation of the fuel switching and environmental dispatch options contained within this Action Plan, while also providing the operating utility with a substantial degree of flexibility in implementing the mandate through the pursuit of least-cost strategies.

Wastes Sector

1. Implement Pay-As-You-Throw (PAYT) or Volume-Based Fees Programs.

A PAYT program, or the establishment of volume-based fees, would enable each citizen to understand the environmental and economic costs of the volume of waste they send to a landfill. If Delawareans are charged per bag or per amount of waste produced, it is likely that the amount they dispatch individually to a landfill would decline. There are several different methods by which a PAYT program can be initiated and enacted. For example, a PAYT or volume-based fees policy may be enacted either state-wide or within individual communities. An alternative policy approach that sets permit fees according to the volume of greenhouse gas emissions attributable to a waste type could achieve a similar incentive for waste reduction.

2. Implement a mandatory curbside recycling program.

In order to meet the State target for recycling, it would appear that mandating recycling is needed. Such a policy would make it easier and more convenient for Delawareans to participate in the recycling of wastes.

Currently, Delaware Solid Waste Authority's *Recycle Delaware* Program offers a strictly voluntary approach to recycling, which has resulted in a lower recycle rate than neighboring states. A curbside recycling program, such as the one enacted in New York, would provide Delawareans with the means to separate their recyclables from the remainder of their garbage for weekly pick-up.

3. Improve the bottle refund system.

Currently, Delaware has a refund system through which citizens can return their bottles to different stores across the state in exchange for a portion of the deposit money paid. A two-fold improvement can be made on this refund system. First, more locations can be established at which this exchange can take place. Second, the bottle refund system can be better advertised so as to promote the scheme and increase participation of Delawareans.

4. Increase participation in voluntary federal programs.

There are several federal government programs that Delaware can take advantage of in order to reduce GHG emissions from the wastes sector. For example, through USEPA's Wa\$teWi\$e Program, local municipalities, larger corporations, or non-profit organizations can partner with the USEPA to reduce costly municipal solid waste that would otherwise end up in landfills. Greater participation in federal programs should be encouraged.

Forest Sinks Sector

1. Strengthen afforestation/ reforestation and urban tree planting programs.

Tree planting is a primary means of enhancing Delaware's total carbon sink capacity. Programs supporting and/or encouraging tree planting can be effective in both rural and urban settings. Existing programs have typically sought a range of goals, such as habitat conservation, scenic values, and wildlife corridors. Afforestation and urban tree planting are no-regret options that provide benefits beyond emission reductions. Expansion of the State's existing afforestation and urban tree planting programs can yield low-cost carbon sequestration.

2. Develop growth management strategies that include afforestation/ reforestation goals.

Low-density urban expansion continues to characterize new development in Delaware. Allowing urban development to spread out upon rural, undeveloped land accelerates the already rapid rate of loss of existing forests. However, strategies exist to support development that does not contribute to sprawl. Growth management policies provide a compromise between the need for growth and the need to control sprawl by encouraging compact growth that preserves existing forestlands. Development is directed to areas where infrastructure exists or can be adequately and efficiently provided. Such policies typically require state and local governments to adopt comprehensive, coordinated land use plans that include consideration of natural resources, farmland, and forest impacts of development.

3. Strengthen forest management legislation to encourage conservation

A Rural and Forest Preservation Act is needed in Delaware. State funds would be earmarked to better preserve forestlands and rural areas vulnerable to development. Such legislation has been recommended in earlier studies conducted by the Center for Energy

and Environmental Policy in 1994 (*Clean Air Act Compliance Options: Policies to Address Land Use, Transportation, and Air Quality in Delaware*) and in 1996 (*Growth Management in Delaware: Planning for Delaware's Future*).

Part II. Additional Policy Initiatives with the Potential to Reduce GHG Emissions and/ or Enhance Forest Sink Capacity

Policies can be identified which will provide medium to longer-term support for efforts to reduce GHG emissions and/or enhance sink development. Additionally there are a range of concepts that are not policies in the strict sense which nonetheless offer a means to achieve similar results. In both cases, the quantity of reductions and/or enhancement cannot be readily estimated, but such initiatives are nonetheless deemed essential by the DCCC to the overall success of the Action Plan.

1. Reform Delaware's land use planning.

A number of professionals and experts dealing with air quality issues in the region have focused their attention on the need for major revisions to the State's overall policy approach to transport and land planning activities, and the relationship between the two. Reducing greenhouse gas emissions in the longer term necessitates fundamental revisions to the manner in which development is planned and transport services are provided. Accordingly, a long term policy approach of growth management is recommended by the DCCC which emphasizes changes to the structure, settlement density, and social organization of urban centers on the one hand, and to providing a variety of means of providing transport services characterized by minimal environmental impact, on the other.

2. Expand Delaware's mass transit options and opportunities.

A variety of specific measures have been identified that link energy, climate change, planning and other policy agendas. Further extending the state's mass transit

infrastructure and its widespread promotion would provide the opportunity and the necessary awareness for increased utilization of this transport mode. Linking mass transit to commercial and residential development increases the population of potential users. Portland, Oregon exemplifies such integrated land use and public transport planning. Policy initiatives include alternative fuels that exploit biologically-derived fuels (such as wood ethanol and organic-based biodiesel).

3. Investigate a broader-based renewable energy policy initiative.

If promised technological improvements materialize, it will be possible to implement a renewable portfolio standard greater than the 1% recommended in the Action Plan. If such improvements occur over the lifetime of the Action Plan's implementation, then an appropriate policy response would be technically feasible. A greatly increased role for low-carbon fuels and renewable fuels for generating electricity offers the principal means to significantly reduce the utility sector's greenhouse gas emissions. Principal proven renewable energy technologies include photovoltaic cells, solar water heating, wind energy, geothermal energy, and hydro, all of which have found commercial applications. Achieving large-scale market penetration of alternative energy still appears to be several years away, despite rapid growth in applications around the country in recent years. In the longer-term, other technologies might achieve sufficient development to become commercially viable, such as fuel cells, tidal energy and advanced wood gasification. Capture of greenhouse gas emissions from landfills can reduce overall state emissions (especially of methane and CO₂); it also provides a potential fuel source for electricity generation. Local, community and domestic scale energy systems may develop the potential to replace centralized grid power.