

TOWARD A SUSTAINABLE ENERGY POLICY FOR THE STATE OF DELAWARE

Senator Harris B. McDowell, III
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Please accept this document as a ‘work-in-progress’ on my goals for a comprehensive Sustainable Energy Policy for the State of Delaware. I have in mind more initiatives than described here, but I have tried to lay out several key policy actions which I believe have top priority for this spring. I would not want to postpone consideration of these top-priority items.

EXECUTIVE SUMMARY

To serve the near- and long-term economic, social and environmental interests of our State, Delaware requires a Sustainable Energy Policy. This policy must mitigate inescapable features of our current energy system: its tendency toward price volatility; the lack of locally provided, competitive energy services; the high environmental costs of its current operations; and the present inability of citizens and small businesses to govern their energy futures.

The immediate goals of a Sustainable Energy Policy need to be:

- Provide residential energy users with the means to reduce their electricity bills by at least 10% in two years and 20% within five years.
- Offer sustainable energy services in a manner that would encourage at least 50% of Delawareans to acquire them.
- Organize a solar electricity market that takes advantage of our State’s exceptional assets regarding photovoltaic technology so that, within 10 years, 1-2% of needed electric power capacity derives from this local resource.
- Spur the entry of high-efficiency vehicles in our State so that residents are not forced to be ‘price takers’ when it comes to transport energy.
- Ensure energy affordability for all Delawareans by creating a 100 kWh lifeline at 5 cents per kWh for households served by the State’s Low Income Home Energy Assistance Program, and complement this with an extensive, cost-effective weatherization program.
- Establish State government as a leader in the transition to sustainable energy use.
- Meet all goals while improving our State’s environmental quality and livability.

To accomplish these goals, I propose:

- The creation of a Delaware Sustainable Energy Utility whose management is competitively bid and whose operations are market-based.
- Through the Delaware Sustainable Energy Utility, the aggressive development of Energy Efficiency and Conservation, Solar Energy and High-Efficiency Vehicle Markets.
- Investment of State collected fees and taxes in these markets and in a Public Sector Sustainable Energy Leadership Program with the expectation that benefits accruing to the State will exceed all program costs

STATE ENERGY POLICY IN CONTEXT

In 1999, with the support of both political parties, members of the Delaware Public Service Commission, the business community and the News Journal, the State of Delaware deregulated its electricity markets. *Before* it took this step, the State relied on an unsustainable energy system. *Since* deregulation of its electricity markets, the State has continued to rely on an unsustainable energy system.

An unsustainable energy system has four features that put at risk the State's social well-being, economic vitality and environmental quality:

1. *Unavoidable price volatility*: The State's energy system depends heavily upon fuels that are non-renewable and supplied from politically volatile regions of the world. As a result, they are subject to sharp swings in prices. Since 1999-2000, natural gas prices have increased by 357%, oil prices by 296%, gasoline prices by 126%, and coal prices by 160%. Delawareans and local businesses receive electricity mainly from coal and increasingly from natural-gas fired plants. We heat our buildings and secure hot water mostly with natural gas, electricity and oil. Our transport needs derive almost entirely from oil products, especially gasoline and diesel. Our State's agriculture sector meets much of its commercial energy requirements from fossil fuels and electricity (although some farm operations are using bioenergy from byproducts to meet selected needs).
2. *Locally non-competitive 'supply-only' systems*: Energy service delivery for Delaware's citizens and most businesses is provided by a system that is supply-focused and has few competitors. The State has only one private electric utility and a modest number of non-competing municipal and regional utilities who determine electricity distribution. Gasoline, oil, coal and natural gas prices are set by very large companies based on national and international factors and cannot be much affected by our State's policies or consumers. Our families or small and medium-size businesses have little scope to exercise choice regarding the supply of energy to the State.
3. *Environmentally risk-prone energy provision*: Our transport and electricity sectors are the largest sources of air quality problems and represent major sources of water quality problems in the State. Energy industries and large energy consumers are also significant sources of soil contamination in Delaware. Companies and public authorities that operate the current energy system or are large energy users report that they have and will continue to take steps to address some of these problems, but many often point out that solutions are high-cost. This means that if we remain dependent on the existing unsustainable energy system, we will experience persistent conflicts between livability and sustainability goals for our State and its economic vitality.
4. *Inadequate opportunities for energy governance*: While the State has regulatory authority created by statute to supervise aspects of energy supply and delivery, this authority is exercised largely without the knowledge or participation of the citizens of the State (surveys have shown that many Delawareans are unaware of the existence or activities of our State energy regulators). Tools that could greatly assist citizens and small- and medium-size businesses in mitigating the effects of energy price volatility, locally uncompetitive supply and environmental risk often receive insufficient attention

in the prevailing governance system. Opportunities to manage energy demand through access to higher efficiency technologies did not receive regulatory support before electricity deregulation and, despite the development of a clear policy agenda for energy efficiency and conservation in the State-supported Delaware Climate Change Action Plan,¹ Delaware ranks last or near the bottom in state policy attention to this tool. Until passage last legislative session of the Renewable Portfolio Standard (SB 74, which I authored), no major policy effort had been directed to the development of renewable energy markets. As is true for all states, Delaware has important renewable energy sources that it could tap to create locally based energy supply and these sources, according to most expert analyses, must play a central future in our own State's and our nation's energy future. To this Governor's credit, she recognized the long-term energy challenges confronting our State. Governor Minner mobilized the first State Energy Task Force in more than two decades to address all dimensions of energy supply, demand and development. Through her leadership, we have important elements of an energy policy agenda which, hopefully, will now be acted upon with greater speed. We have made progress under her leadership, but the Governor is aware that we need to do much more, as a reading of her Executive Order 82 indicates.

OUR POLICY CHALLENGE

Delaware needs a comprehensive *Sustainable Energy Policy* that can remove our State's current vulnerability to non-renewable energy price volatility, the lack of local energy competition and the environmentally risky character of current energy provision. To replace the currently unsustainable energy system with a sustainable one and to maintain the long-term energy sustainability interests of our State, we need to take several actions. More can be identified than the two I have highlighted below, but I doubt that a comprehensive Sustainable Energy Policy can be forged without them.

CREATE A LARGE, MULTIFACETED ENERGY EFFICIENCY & CONSERVATION MARKET

National and state energy policies for a century have single-mindedly focused on energy supply as the core concern. Little attention has been given to energy demand and, in particular, the creation of significant energy user choice about when, how and whether energy is used.

Decisions by developers and architects are estimated to determine 70% of energy use in our homes. We must do better than we have to create viable energy efficiency and conservation choices for our citizens.

For our low- and moderate-income families, the volatility of non-renewable energy prices creates special risks that must be addressed. Here too, energy efficiency and conservation have vital roles. Using rigorous evaluation methodologies, a recent report on our State's Weatherization Assistance Program found that weatherized units have 16%-18% lower energy demand after adjustments for income, family size, age of dwelling and other factors. Moreover, the Program generates a commercial-grade benefit-cost ratio in excess of 3.2. Unfortunately, current funding

¹ Published in 2000, Delaware's Plan earned 'best practice' praise from federal agencies. I am proud to have been a member of the 38-stakeholder planning consortium that produced the Plan.

levels limit the service to 500 residential units per year. We must permanently increase funding for this exemplary program and provide its long-term benefits to our citizens.

While hybrid technology has been well known in the transportation industry for decades, vehicle buyers had no opportunity until very recently to purchase cars or trucks with significantly better mile per gallon efficiency and lower vehicle pollution. Our land use planning policies have permitted sprawl, discouraged urban infill and have compounded our transport energy problems. We must do better than we have to serve the transport needs of our citizens sustainably.

Our industrial manufacturers have improved energy efficiency better than other sectors but more can be done, especially to create viable energy efficiency and conservation choices for our small and medium-size enterprises. Since the latter generate the bulk of new jobs in a market economy, we must do better than we have to meet their needs sustainably.

Energy efficiency and conservation provide consumers with clear alternatives to high-priced energy. They are an essential tool to remove the State's vulnerability to non-renewable energy price volatility, to establish a competitive energy market where suppliers cannot simply assume that Delaware's consumers are 'price takers,' and to put Delaware on the path of environmental sustainability and livability. As I have often remarked to my colleagues in State government, the Legislature and environmental organizations, the cleanest kWh is the one we do not use.

DEVELOP A LARGE RENEWABLE ENERGY MARKET

It is wrong to think that Delaware has no energy sources. While we do not have non-renewable energy sources such as coal, oil and natural gas, we in fact have significant renewable energy sources. Received solar energy in our State's borders is sufficient to meet all of our energy needs.

It is also wrong to think that our State's renewable energy sources are too expensive. While they may be too expensive to meet all energy needs presently, there are many opportunities which can now be cost-effectively met if we create a 'level playing field.' Currently, national tax and regulatory policies favor the purchase of energy from non-renewable sources and fail to take into account the many advantages of renewable energy sources over their non-renewable counterparts. These include: greater energy security; no fuel-related price volatility; significant declining per unit costs for the foreseeable future; greater job creation potential (the renewable energy industry is more job-intensive than its non-renewable counterparts); major across-the-board environmental benefits (e.g., no or little air pollution, no thermal pollution, no threat of acidification of rain, freshwater bodies and soils, little or no soil contamination risk, and little or no release of heat-trapping gases that are triggering climate change); and substantial capacity for local governance of energy system development.

The cost and rate of utilization of renewable energy options is significantly determined by policy and regulation. When we fail to include the environmental and other *costs* of non-renewable energy in its price, we advantage their use and thereby unfairly disadvantage the utilization of renewables. Shifting the true costs of non-renewable energy use to, for example, the public health sector may result in energy prices that make non-renewables look cheaper but, in fact, they are not.

Recent price spikes remind us that the consequence of depending on non-renewable energy is that we will inevitably experience periodic volatility in fuel costs, without much time to respond

to their appearance. Renewable energy has no fuel cost volatility – the ‘price’ of received solar or wind energy does not vary – but this fact is not reflected in the way that non-renewables are priced in the U.S. Indeed, through oil depletion allowances and other measures, we actually use policy to subsidize fuel cost volatility.

National policy and regulation is largely responsible for biases in current energy prices of this kind and Delaware cannot alone repeal these biases. But we can recognize them in our State policies and seek to more nearly level the policy playing field. The RPS legislation passed in 2005 is an important step in this direction. Moreover, we can take policy and regulatory action that actually captures the significant *benefits* of renewable energy by means of policies and regulations designed to express these as value to the consumer.

We can and must do more. While Delaware has many renewable energy options, a key one is the conversion of solar energy into electricity. In our State, we have a U.S. Department of Energy-designated ‘center of excellence’ at the University of Delaware investigating this technology and a world class center for the analysis of the policy requirements for its use. We also have state-of-the-art solar electric manufacturing plants in the State (owned by General Electric). Without precluding development of other renewable energy options, we need to take advantage of the extraordinary scientific and manufacturing assets of our State in the area of solar electricity and develop a viable market.

The RPS policy of the State creates an important stimulus for solar electricity development. But if we are to fully capture the benefits of solar electricity to our State, policies and programs are needed to make us attractive to expanded manufacturing and utilization of the technology. Recognizing that a signature benefit of solar electricity is its immunity to fuel price volatility, it represents a key source of non-price spiking, competitive electricity generation, which also avoids distribution costs that are expected to rise in the future. Its use on our buildings can provide our residents with a supply alternative that has desirable characteristics not offered by a non-renewables based electricity generation and distribution system. Precisely because its service characteristics are different from and could compete with those of current electricity providers, we cannot expect this technology to be developed by non-renewable energy based energy suppliers. Policy has a key role to play here.

A SUSTAINABLE ENERGY UTILITY TO SERVE DELAWARE

If we are to receive the full benefits of sustainable energy options, the State must establish a Sustainable Energy Utility focused on securing a statewide market for energy efficiency and conservation, and the development of renewable energy. Existing energy markets have not and will not deliver significant sustainable energy options because national policy and regulation have biased market development in favor of unsustainable energy sources.

Yet, we should harness market forces in the provision of sustainable energy options and in the continued innovation of technologies and services that will improve our ability to meet sustainability goals now and in the long run.

How can this be done?

When the State sought to stimulate an electricity market, it created a utility licensed by and subject to State regulation. An equivalent institutional initiative is needed to stimulate sustainable energy development. However, we should learn from historical experience with the State's electricity utility system that granting a monopoly for this purpose brings many economic problems and does not adequately encourage vigorous pursuit of social and environmental goals that underpin a sustainable energy system. Indeed, the failure of the monopoly scheme is conclusive on the sustainability criteria of *price stability* (spiking fuel adjustment charges are the legacy of the monopoly system), *local energy competitiveness* (the monopoly system precluded alternatives by law), *environmental stewardship* (depending on the pollution index one uses, the monopoly electricity sector rose to become the 1st or 2nd largest source of environmental problems in the State) and *energy governance* (the monopoly scheme turned governance into a contest of experts in which the public had little ability to understand or express their needs).

We would do well to learn from our own experience and that of other states and, instead of creating a monopoly, organize a State licensed, competitively bid Sustainable Energy Utility whose management is regularly evaluated by performance-based criteria, especially those of *price stability*, *the promotion of local energy competitiveness*, *environmental stewardship* and *greater energy governance*.

The creation of a Sustainable Energy Utility will provide the principal means for building a large, multifaceted energy efficiency and conservation market and a large renewable energy market.

Before describing how the Sustainable Energy Utility will function, let me describe two preparatory matters. First, we must create basic standards for energy sustainability that set in place the rules for a market to emerge. My initial ideas are provided below. Second, we must identify investment resources that will enable a 10-year commitment to market development. In this regard, policy tools for aggregating investment funds are described below.

STANDARDS AND LICENSING FOR SUSTAINABLE ENERGY MARKET DEVELOPMENT

A policy infrastructure is needed to set the context for the development of sustainable energy markets. A series of policy actions are needed (see Table 4a. for details):

1. *New Appliance and Building Standards*: The State should adopt in this legislative session new appliance standards for designated appliances² that conform to the midpoint efficiency values of the national *Energy Star*® Program. All new construction and all landlord-operated buildings with 10 or more units should be expected to implement the new standard within one year of passage of the policy. Vendors selling designated appliances should be required to sell at least a set percentage of designated appliances with the mid-point efficiency value, with yearly sales percentages based on a graduated schedule over a five-year period. New building envelope and space conditioning standards should be similarly adopted which reflect higher efficiency values for doors, windows, wall and attic insulation, and heating and cooling systems. Incentives should be built into the standards that reward the use of passive solar design, district heating and cooling and solar water heating in new buildings. Owners of existing buildings should be given incentives to conform to the new standards.

² Refrigerators, freezers, clothes washers, lighting and air conditioners should be included in the new standard.

Standard setting is an essential means of ensuring that appliance and building markets provide consumers with sustainable energy options.

2. *Fast-tracking Permitting of Competitive Electricity Suppliers*: Competitors able to meet specified financial and technical standards and warranties and who can demonstrate business plans that address the sustainable energy criteria of price stability, energy affordability for low- and moderate-income residents and small- and medium-size businesses, environmental stewardship and community involvement in policy-making should receive fast-track attention in State licensing.
3. *New Rules for State Procurement of Energy-Efficient Appliances and Vehicles and Construction of 'Green Buildings'*: The State relies upon taxpayer revenues and these should be used in every case to support the use of sustainable energy resources. For this reason, comparable *Energy Star*® standards for appliances and building construction and renovation should be observed in the public sector. Several organizations specify 'green building' standards and the State should be expected to meet a defined percentage of its building construction and innovation based on adopted 'green building' standards. Government agencies which are successful in meeting sustainable energy goals above those set by standards should be rewarded by receiving the additional savings in their operating budgets. The State must also procure high-efficiency vehicles. With nearly 4,000 vehicles in the fleet, the fact that it has no hybrid cars, no evident management of the fleet's use to promote energy efficiency, and no regularly produced analysis of vehicle fuel use or measures of actual fuel use efficiency is not acceptable. Taxpayers deserve a fleet procurement and management plan that emphasizes energy efficiency and promotes entry of high-efficiency technology.
4. *Transparency in Power Purchase Bidding for Default Suppliers*: Regulatory rules are urgently needed to enable public oversight of the bidding process for power purchases by default suppliers. At least two criteria should be met by these rules: timely advance notice of high bids; and the provision of information sufficient to allow consumer protection from non-competitive or insufficiently competitive bidding practices.

FUNDING FOR SUSTAINABLE ENERGY MARKET DEVELOPMENT

Funding should derive from a menu of policy tools that together ensure a flow of investments in sustainable energy for 10 years. A commitment on this scale is needed if we are to build a genuine sustainable energy market. Table 4b. summarizes the necessary funding and expected impacts for our State.

1. *Green Energy Mill Rate*: The State has recognized through legislation the failure of established energy markets to promote energy efficiency, conservation and renewable energy. It assesses a mill rate on the sale of each kWh of electricity in order to support a Green Energy Fund that furnishes investment funds for these resources. As the primary Senate sponsor of the legislation creating this Fund, I am pleased that the Legislature and then-Governor Carper agreed to act on this important matter. But I always wanted this mill rate to be much higher than what was enacted and recent events underscore the need to substantially raise it. By any criterion, Delaware's mill rate is substantially below that

of other states using this tool (see Tables 5-7). We cannot hope to be competitive in the sustainable energy marketplace with such a small commitment to investment in residential energy efficiency and renewable energy development. Use of the Green Energy Mill Rate recognizes that our citizens and businesses provide the revenue base for investment in electricity market development, but we cannot expect an electric utility whose profit depends upon the sale of kWhs to invest in technologies that reduce electricity demand or invest in technologies that provide critical services such as environmental stewardship and job creation that are not central to a utility's core business. The Green Energy Mill Rate offers a practical means to give consumers the ability to direct a portion of energy expenditures to the development of options that reduce price volatility, promote jobs, build local energy competition, and enhance our State's livability. Because it is set through policy, Delawareans can govern the scope and extent of this source of green energy investment.

2. *Low Income Energy Mill Rate*: In recognition of a second source of market failure, the State likewise created a policy tool to ensure that our families without the ability to afford energy services were not forced to make choices between energy, food and shelter. With the impressive performance of our State Weatherization Assistance Program, it is time to increase this rate in order to allow a doubling of low- and moderate-income residential units annually weatherized in our State. This investment will ensure that all citizens, regardless of income, are able to enjoy the benefits of energy efficiency. At the same time, such investment will lower the risk of energy unaffordability and allow better use of State funds to promote efficiency (rather than paying energy companies for energy being lost to drafty windows, poorly insulated walls and attics and wasteful furnaces).
3. *Public Utility Tax*: Currently, the State's energy utilities pay this tax but none of its revenue is earmarked for investment in sustainable energy use. Henceforth, increases in the State's receipts of revenues from this tax that are due to higher energy prices should be earmarked in full to support investment in the development of sustainable energy markets and to fund new weatherization assistance for low-income homeowners.
4. *Gross Receipts Tax*: I would like to see a long-term strategy to lower this tax rate contingent upon companies who are subject to its provisions investing in the use of on-site renewable energy technologies or in investments in these technologies to address low- and moderate-income energy needs. I have developed legislation for this purpose but I will not focus on it here. Immediate action is needed to earmark a portion of receipts from this tax assessed on our energy industries to support activities of the Sustainable Energy Utility. By this means, we will ensure that investment funds are pooled not only from electric utility sources but all energy providers.
5. *High-Efficiency Vehicle Income Tax Credit*: The State needs to enact an income tax credit for the purchase of designated high-efficiency residential vehicles based on efficiency improvements measured by the benchmark of the typical 4-cylinder car purchased in the U.S. The tax credit should complement the federal income tax credit as an additional incentive. Delawareans experienced high gasoline prices and have endured sizable price spikes for this energy source over the past 18 months. An income tax credit for high-efficiency vehicles has proved effective in several states and led the federal government to employ it. The State tax credit must be restricted to Delaware residents with driver's licenses. Violation of specified traffic laws (including those governing driving under the

influence) will result in an automatic fine equal to value of the tax credit, in addition to whatever punishment the violator would normally receive.

LAUNCHING A SUSTAINABLE ENERGY UTILITY

Energy Efficiency and Conservation Market

The initial goals and funding of the Sustainable Energy Utility for Energy Efficiency and Conservation are as follows:

- Programs promoting energy efficiency and conservation for participating residents that can lower electricity and natural gas needs by at least 10% in two years and 20% within five years
- Retirement of appliances 10 years or older should receive priority attention
- Programs meeting this goal that will reach at least 50% of Delaware's residents in five years

→ At least \$1.15 million from Public Utility Tax collections should be annually earmarked for use by the Delaware Sustainable Energy Utility to support investment in designated residential energy efficiency and conservation services. In addition, the Green Energy Mill Rate should be increased to provide an additional \$5.45 million annually to support new appliance, HVAC and water heater rebates. See Tables 1 and 2.

Benefit to Delaware: The Energy Efficiency and Conservation Market stimulated by the Delaware Sustainable Energy Utility will provide citizens with *saved energy at a program price of less than one cent per kWh* (compared to 15 cents per kWh of generated electricity). Participating households are estimated to experience *25% reductions in energy bills*.

Residential Solar Energy Market

The initial goals and funding of the Sustainable Energy Utility for a Residential Solar Energy Market are as follows:

- Expansion of the existing Solar Rebate Program supported by the Green Energy Fund so that at least 1,000 households not eligible for the Solar Lifeline (see below) are annually served with solar electric systems not to exceed 2 kW

→ At least \$0.5 million from Public Utility Tax collections, \$0.5 million from the Green Energy Fund and \$5 million from general tax funds will be annually earmarked for use by the Sustainable Energy Utility to support the Solar Rebate Program. The Renewable Energy Credits (RECs) associated with these installations will be shared equally between the Sustainable Energy Utility and the residential program participant. It is expected that revenue from the sale of the Sustainable Energy Utility's share of the associated RECs will replenish general tax funds after five years of program implementation. Solar energy RECs are currently selling in regional markets for \$0.15 per kWh and involve multi-year contracts of 4 to 8 years (see Appendix 1).

Benefit to Delaware: After the value of RECs are included, the Solar Rebate Program managed by the Delaware Sustainable Energy Utility will provide citizens with *green*

energy at a per kWh price that is less than the 20-25 cents paid per kWh on the PJM spot market during summer peak hours.

- The creation of a Solar Lifeline of 100 kWhs per month³ for all low-income households served by the Low Income Home Energy Assistance Program (LIHEAP)
- A doubling of low-income residential units weatherized by the State's Weatherization Assistance Program

→ The Low Income Energy Mill Rate should be increased to provide an additional \$0.50 million to support the State's Weatherization Assistance Program. The additional funding should be used to double statewide activity. A separate increase in the Green Energy Mill Rate and an earmarking of Gross Receipts Tax revenues should together support annual investments in solar electric installations on public buildings and residences. The needed funding would initially be \$4 million and in nine years would reach \$8.44 million. The distributed solar energy plant will produce solar electric generation sufficient to support 100 kWhs per month for 14,000 LIHEAP-served households throughout the State. The Sustainable Energy Utility will be responsible for implementing and managing the installation and maintenance program for solar electric generation and will sell its bundled output to relevant electricity providers serving eligible households for 4.5 cents per kWh. Electricity providers will be restricted to selling the acquired energy for 5.0 cents per kWh (no distribution or other charges will be permitted for this 100 kWh per month per household allotment). The Sustainable Energy Utility will own the Renewable Energy Credits (RECs) associated with this solar electric generation. Revenues from sales to electricity providers and from the sale of RECs are expected to replenish the State's Green Energy Fund in an amount that will offset all capital costs incurred by the State for this nine-year program (and may produce a \$1 million surplus – see Table 3 and Appendix 1).

Benefit to Delaware: The Solar Lifeline Program managed by the Delaware Sustainable Energy Utility will provide low- and moderate-income citizens with *affordable, clean energy at a price of 5 cents per kWh*. Adding the increased activity of the better funded Weatherization Assistance Program, participating low- and moderate-income households will experience *reductions in annual energy bills of 24-26%*. (If households also take advantage of the Energy Efficiency & Conservation Rebates offered by Delaware's Sustainable Energy Utility, savings will climb and could reach more than 35%.)

Together, the Solar Rebate and Solar Lifeline Programs will provide a statewide benefit in the form locally supplied, green and competitive energy equal to 1-2% of the MW capacity needed to power our State. As shown by a 2005 Lawrence Berkeley National Laboratory study entitled "Easing the Natural Gas Crisis" (download from <http://eetd.lbl.gov/EA/EMP>), the *hedge value of 1-2% renewable energy supply is sufficient to moderate boiler fuel price spikes and lower generation costs by 0.75-2.0 cents per kWh*.

High-Efficiency Vehicle Market

- The Sustainable Energy Utility should be responsible for marketing the State's high-efficiency vehicle income tax credit to vendors and residents. Performance targets

³ The 100 kWh lifeline target is a first step. My aim is to advance the target to 300 kWh after more research is conducted by my team and I am hopeful that we can meet this goal in the near future.

need to be set such that 25% energy savings can be realized by at least 10% of new residential vehicle purchasers by the fifth year of the program.

→ The High-Efficiency Vehicle Income Tax Credit would provide all incentive funding for this program.

Benefit to Delaware: The High-Efficiency Vehicle Income Tax Credit Program managed by Delaware's Sustainable Energy Utility will provide benefits to citizens that are still being calculated.

Public Sector Sustainable Energy Leadership Program

- State owned facilities should be required to meet EO 82 targets. Additionally, a High-Efficiency Vehicle target should be set and the State should be expected to establish a Green Buildings target. Together, these initiatives will constitute a Public Sector Sustainable Energy Leadership Program.

→ Funding amount and source to be determined.

Benefit to Delaware: The Public Sector Sustainable Energy Leadership Program managed by the Delaware Sustainable Energy Utility will provide benefits to citizens that are still being calculated.

A Market-Based Approach to Sustainable Energy Development

A five-year management contract should be competitively bid, with specified annual performance targets, for the right to operate the Delaware Sustainable Energy Utility. One or more contracts could be organized, if bidders present this opportunity. The yearly amount of the contract and possible performance incentives need to be determined. At some point, it would be useful to consider the creation of a multi-jurisdictional utility structure for the development of sustainable energy resources in our State. This would encourage competition in the energy market not only between sustainable energy and conventional energy providers but among sustainable energy providers as well.

Investing in a Sustainable Energy Future for Delaware

Initial funding for the Delaware Sustainable Energy Utility will be provided from three sources, as discussed above (see Table 4b. for details):

- Increased fees for the Green Energy and Low-Income Energy Assistance Funds (with clarification that the former can be used to support the designated energy efficiency rebates described above). The combined mill rate increase would vary over a nine-year period but would yield an average of approximately \$9 million more than presently collected. This would result in an increase in the typical residential monthly electricity bill of approximately \$2.00.
- Utilization of State taxes (specifically, the Public Utility Tax, the Gross Receipts Tax on energy industries and general tax revenues). These sources would furnish approximately \$7 million in funding for rebates and solar electric installations.

- Revenues earned from the sale of solar electricity and associated RECs, conservatively, will provide more than \$95 million in state revenues (including the State’s share of REC sales for the Solar Rebate Program). And over the 30-year operating life of 15 MW solar electric plant, all citizens and businesses of Delaware will receive the hedge value of this investment in the form of lower vulnerability to natural gas spikes.

Table 1. Summary of Energy Impacts of the Proposal for a Delaware Residential Energy Efficiency & Conservation Program Operated by the Sustainable Energy Utility

Appliance Type	Total Targeted Energy Star Sales per year	Average Annual Electricity Savings per unit (kWh) (difference between E-Star and >10yr-old appliance)	Average Annual Fuel Savings per unit (kBtu) (difference between E-star and >10 year old appliance)	Total Annual Energy Savings (kWh/yr)	Total Annual Fuel Savings (kBtu)	Rebate Schedule (\$/unit)
Refrigerators	22,662	750		16,996,736		75
Freezers	670	609		408,251		30
Clothes Washers	15,861	815		12,927,076		75
Low Flow Showerhead	50,000	93		4,650,000		5
CFLs	100,000	77		7,700,000		2
Residential Light Fixtures	100,000	85		8,500,000		10
Central AC w/o Heat Pump	14,380	1,794		25,797,895		200
Room AC	13,367	385		5,146,310		35
Central AC w/ Heat Pump	3,192	1,511		4,823,070		200
Water Heaters - Electric	4,823	375				35
Water Heaters - Nat. Gas	1,806		4,500		8,126,366	35
Heating - Gas Furnace	1,953		53,200		103,875,048	200
Heating - Oil Furnace	772		36,600		28,252,778	200
Heating - LPG Furnace	681		53,200		36,235,482	200
Low Flow Showerhead	1,806		755		1,363,424	5

Table 2. A Comparison of Benefits and Costs of Two Energy Efficiency Program Initiatives

<u>Summary of Benefits of Senator McDowell’s Proposal for a Delaware Residential Energy Efficiency & Conservation Program</u>		<u>Summary of Benefits of Staff Proposals for Residential Energy Efficiency Incentives in Response to EO 82</u>	
<u>10-Year Lifecycle Totals</u>		10-Year Lifecycle Totals Items 1 and 2	
Annual energy savings (years 1-5) (kWh)	101,177,586	Additional annual energy savings (years 1-5) (kWh)	17,474,872
Total energy savings after 10-years (kWh)	4,047,103,458	Total energy savings after 10-years (kWh)	698,994,861
Households	150,000	Households	150,000
E-savings/household per month(kWh/mo)	281 kWh/mo	E-Savings/household per month (kWh/mo)	49 kWh/mo
\$-Savings per household/mo	\$42.16	Savings per household/mo (\$/mo)	\$7.28
%-Savings in monthly household electric bill	28%	%-Savings in monthly household electric bill	4%
Annual Cost of Rebate Program(\$)	\$5,447,868	Annual Program Funding (\$)	\$1,600,000
Cost to State/kWh saved (\$/kWh)	\$0.00673/kWh	Cost to Sate/kWh saved (\$/kWh)	\$0.01145/kWh
Needed Residential Mill Rate to Fund Rebate Program (\$/kWh)	0.001266	Needed Residential Mill Rate to Fund Rebate Program (\$/kWh)	0.000137
<p>*Note: Assumes 25% of energy savings are met by new State appliance and building standards, and that \$1.15 million of annual program costs are provided by collections of the PUT.</p> <p>Sources: DOE, EIA, DEER California, Buildings Energy Data Book, RECS, OEE Canada, NREL, U.S. Census</p>		<p>*Note: Assumes \$1.15 million of annual program costs are provided by collections of the PUT.</p>	

Note: Assumes both programs are funded for 5 years, but energy savings continue for 5 years after each program ends (in order to take into account lifetime savings of the high-efficiency appliances).

Table 3. Summary of the Proposal for a Delaware Solar Lifeline Program Operated by the Sustainable Energy Utility

a. Solar Electric Plant Installation Schedule

	PV Installed per year	Total Households	% of LIHEAP households (DP&L customers)	Energy per household	Total yearly output
	(kW)	(#)	(%)	(kWh/month)	(kWh)
Year 1	600	587	4%	100	704,760
Year 2	780	1,351	10%	100	1,620,948
Year 3	1,014	2,343	17%	100	2,811,992
Year 4	1,318	3,634	26%	100	4,360,350
Year 5	1,714	5,311	38%	100	6,373,215
Year 6	2,100	7,367	53%	100	8,839,875
Year 7	2,325	9,642	69%	100	11,570,820
Year 8	2,550	12,138	87%	100	14,566,050
Year 9	2,525	14,023	100%	100	16,827,155

b. Nominal Costs of the Solar Lifeline Program

Lifeline Costs

	PV Installed per year	Total yearly output	Total Yearly Costs (minus RECs and Lifeline wholesale earnings)	Needed residential mill rate (statewide) ⁴
	(kW)	(kWh)	(\$)	(\$/kWh)
Year 1	600	704,760	4,062,572	0.00047
Year 2	780	1,620,948	4,870,915	0.00056
Year 3	1,014	2,811,992	5,857,606	0.00068
Year 4	1,318	4,360,350	7,061,074	0.00082
Year 5	1,714	6,373,215	8,527,731	0.00099
Year 6	2,100	8,839,875	9,650,804	0.00112
Year 7	2,325	11,570,820	9,707,311	0.00113
Year 8	2,550	14,566,050	9,624,941	0.00112
Year 9	2,525	16,827,155	8,444,661	0.00098

c. Net Costs and Benefits of the Solar Lifeline Program

Net Lifeline Results (30 years)		Lifeline Costs	
Total installed PV capacity (kW)	14,926	Lifeline PV energy wholesale price for DE utilities	\$0.045/kWh
Total PV output (kWh)	421,045,425	Lifeline PV energy retail price for all LIHEAP households first 100kWh/mo of consumption	\$0.05/kWh
Monthly PV energy / household (kWh/mo)	100	Total Lifeline wholesale earnings (over 30 yrs) (@ \$0.045/kWh)	\$18,947,044
Households	14,023	Total REC earnings (over 30 yrs) (REC = \$.15/kWh)	\$63,156,814
Net monthly savings (\$/mo)	8.30	Total Capital Cost of PV	\$81,004,272
Cumulative household savings (\$)	42,104,542	Net Lifeline SURPLUS	+\$1,099,586

⁴ Assumes that one-half of needed public investment derives from existing State taxes.

Table 4. Summary of the Delaware Sustainable Energy Utility Measures

a. Legislative and Regulatory Initiatives

Measure	Goals
Establish statutory requirements for a Sustainable Energy Utility	<ul style="list-style-type: none"> • Create the means for establishing a true market in which consumers can choose between energy supply and energy efficiency competing on a level playing field • Bid the management and operations of the Sustainable Energy Utility every five years with specific annual performance and management targets
Establish standards for appliances	<ul style="list-style-type: none"> • Increase the energy efficiency of household appliances by: <ul style="list-style-type: none"> ⇒ Setting minimum appliance efficiency standards for rental units and new housing construction, and ⇒ Establishing rebate programs for Energy Star rated appliances for retail distributors and purchasers
Fast track permitting for competitive suppliers	<ul style="list-style-type: none"> • Develop fast track licensing for competitors who demonstrate commitment to sustainability
Establish purchasing standards for Sate government	<ul style="list-style-type: none"> • Increase energy efficiency in State government by setting minimum energy efficiency standards for equipment, vehicles and new construction and renovation projects
Transparency in bidding for default electricity providers	<ul style="list-style-type: none"> • Develop regulations requiring public oversight of default provider bidding including notification of high bids and better consumer information
Modify methods of collecting income taxes through rates	<ul style="list-style-type: none"> • Insure that taxes collected through rates are actually paid by utilities • Require separation of regulated and unregulated tax accounting

Table 4b. Goals, Impacts and Funding of the Sustainable Energy Utility

Program/Measure	Goals	Impacts	Annual Funding
<p>Energy Efficiency and Conservation Market Program</p> <p>Implemented and managed by Sustainable Energy Utility</p>	<ul style="list-style-type: none"> Promote programs for energy efficiency and conservation that will reduce electricity, gas, and other energy requirements of residential customers by at least 10% in 2 years and 20% in 5 years Reach at least 50% of residents Target appliances 10 years or older for replacement through incentives 	<ul style="list-style-type: none"> Reduce average monthly residential consumption by 281 kWh/month, which is equivalent to \$42/month, or approximately a 26% saving per year (assuming a price of 15.9 cents per kWh) 	<ul style="list-style-type: none"> Earmark \$1.15 million from existing Public Utility Tax collections Additional \$5.45 million from increased Green Energy Fund mill rate
<p>Solar Lifeline Program</p> <p>Implemented and managed by Sustainable Energy Utility</p>	<ul style="list-style-type: none"> Create a Solar Lifeline of 100 kWh per month for approximately 14,000 households annually participating in Delaware’s LIHEAP 	<ul style="list-style-type: none"> Provide first 100 kWh of electricity to low income customers from solar energy at 5.0 cents/kWh Install approximately 15 MW of PV generating capacity over ten years Hedge value will help to decrease conventional fuel prices (LBNL study) 	<ul style="list-style-type: none"> Increase Green Energy Fund mill rate and earmark Gross Receipts Tax revenue. Annual funding needed is approximately \$8.0 million over 9 years Expenditures from Green Energy fund will be replenished through sale of PV electricity at 4.5 cents/kWh and sale of RECs at 15 cents/kWh. Revenues from sale of PV electricity and RECs result in an estimated <i>surplus</i> to the State of nearly \$1.1 million.
<p>Residential Solar Energy Market Program</p> <p>Implemented and managed by Sustainable Energy Utility</p>	<ul style="list-style-type: none"> Significantly expand current Green Energy Fund PV rebate program Establish a market for Solar Renewable Energy Credits in Delaware to promote broader use and economic viability of solar electricity 	<ul style="list-style-type: none"> Install 1,000 systems per year (up to 2 kW each) on households not participating in the Solar Lifeline Program Customer to own one-half of RECs and Sustainable Energy Utility markets the rest 	<ul style="list-style-type: none"> Earmark \$0.5 million per year from existing Public Utility Tax collections Earmark \$5.0 million per year from general tax funds Recover general tax fund revenues after five years through sale of SEU’s portion of RECs
<p>Enhanced low income weatherization program</p> <p>Implemented and managed by current Weatherization Assistance Program</p>	<ul style="list-style-type: none"> Double the number of households participating in the Weatherization Assistance Program Dramatically increase energy efficiency for low income, LIHEAP-participating households 	<ul style="list-style-type: none"> Typical impacts are a reduction of 24% to 26% per household in heating and cooling energy use 	<ul style="list-style-type: none"> \$0.5 million through doubling of current mill rate for low-income energy assistance
<p>High Efficiency Vehicle Market Program</p> <p>Implemented and managed by Sustainable Energy Utility</p>	<ul style="list-style-type: none"> TBD 	<ul style="list-style-type: none"> TBD 	<ul style="list-style-type: none"> TBD
<p>Public Sector Sustainable Energy Leadership Program</p>	<ul style="list-style-type: none"> TBD 	<ul style="list-style-type: none"> TBD 	<ul style="list-style-type: none"> TBD

Table 5. US State-Legislated Public Benefit Charges (PBC) for Energy Efficiency (EE), Renewable Energy (RE) & Low-Income Energy (LI-E) Programs (mills per kWh)

Sorted by Summed Mill Rate Amount

State	Summed PBCs for EE+RE+LI-E	% of Revenue
California	4.81	3.78%
Connecticut	4.30	4.30%
Massachusetts	3.00	3.38%
New Hampshire	3.00	2.91%
Vermont	2.64	2.40%
Wisconsin	2.43	3.97%
Rhode Island	2.30	2.21%
Oregon	2.19	3.00%
Maine	2.07	2.02%
New Jersey	1.77	1.89%
Arizona	1.49	1.84%
Nevada	1.39	1.62%
Montana	1.32	2.16%
New York	1.04	1.18%
District of Columbia	0.91	1.24%
Texas	0.86	1.28%
Ohio	0.83	1.24%
Pennsylvania	0.73	0.96%
Illinois	0.67	0.96%
Maryland	0.51 *	0.82% *
Michigan	0.37	0.54%
Delaware	0.275	0.41%
New Mexico	0.10	0.15%

28 States with no Public Benefit Charges

* Maryland's PBC will be at least at this level. The mill rate for energy efficiency must still be finalized.

Table 6. US State-Legislated Public Benefit Charges (PBC) for Energy Efficiency (EE), Renewable Energy (RE) & Low-Income Energy (LI-E) Programs (mills per kWh)

Sorted by % Revenue

State	Summed PBCs for EE+RE+LI-E	% of Revenue
Connecticut	4.30	4.30%
Wisconsin	2.43	3.97%
California	4.81	3.78%
Massachusetts	3.00	3.38%
Oregon	2.19	3.00%
New Hampshire	3.00	2.91%
Vermont	2.64	2.40%
Rhode Island	2.30	2.21%
Montana	1.32	2.16%
Maine	2.07	2.02%
New Jersey	1.77	1.89%
Arizona	1.49	1.84%
Nevada	1.39	1.62%
Texas	0.86	1.28%
District of Columbia	0.91	1.24%
Ohio	0.83	1.24%
New York	1.04	1.18%
Pennsylvania	0.73	0.96%
Illinois	0.67	0.96%
Maryland	0.51 *	0.82% *
Michigan	0.37	0.54%
Delaware	0.275	0.41%
New Mexico	0.10	0.15%

28 States with no Public Benefit Charges

* Maryland's PBC will be at least at this level. The mill rate for energy efficiency must still be finalized.

Table 7. List of All US State-Legislated Public Benefit Charges (PBC) for Energy Efficiency (EE), Renewable Energy (RE), & Low-Income Energy (LI-E) Development (mills per kWh)

State	PBC for EE	PBC for RE	PBC for LI-E	Summed PBCs for EE+RE+LI-E	% of Revenue
Alabama	NA	NA	NA	NA	NA
Alaska	NA	NA	NA	NA	NA
Arizona	0.57	0.73	0.19	1.49	1.84%
Arkansas	NA	NA	NA	NA	NA
California	3.21	0.76	0.84	4.81	3.78%
Colorado	NA	NA	NA	NA	NA
Connecticut	3.00	1.00	0.30	4.30	4.30%
Delaware	NA	0.178	0.095	0.275	0.41%
District of Columbia	0.38	0.02	0.51	0.91	1.24%
Florida	NA	NA	NA	NA	NA
Georgia	NA	NA	NA	NA	NA
Hawaii	NA	NA	NA	NA	NA
Idaho	NA	NA	NA	NA	NA
Illinois	0.03	0.04	0.60	0.67	0.96%
Indiana	NA	NA	NA	NA	NA
Iowa	NA	NA	NA	NA	NA
Kansas	NA	NA	NA	NA	NA
Kentucky	NA	NA	NA	NA	NA
Louisiana	NA	NA	NA	NA	NA
Maine	1.50	NA	0.57	2.07	2.02%
Maryland	TBD	NA	0.51	0.51	TBD
Massachusetts	2.25	0.50	0.25	3.00	3.38%
Michigan	0.07	NA	0.30	0.37	0.54%
Minnesota	NA	NA	NA	NA	NA
Mississippi	NA	NA	NA	NA	NA
Missouri	NA	NA	NA	NA	NA
Montana	0.84	0.17	0.31	1.32	2.16%
Nebraska	NA	NA	NA	NA	NA
Nevada	0.82	0.18	0.39	1.39	1.62%
New Hampshire	1.80	NA	1.20	3.00	2.91%
New Jersey	1.22	0.41	0.14	1.77	1.89%
New Mexico	0.10	NA	NA	0.10	0.15%
New York	0.83	NA	0.21	1.04	1.18%
North Carolina	NA	NA	NA	NA	NA
North Dakota	NA	NA	NA	NA	NA
Ohio	0.11	NA	0.72	0.83	1.24%
Oklahoma	NA	NA	NA	NA	NA
Oregon	1.48	0.38	0.33	2.19	3.00%
Pennsylvania	NA	0.05	0.68	0.73	0.96%
Rhode Island	2.30	Shared w/ EE	In rates		2.30
South Carolina	NA	NA	NA	NA	NA
South Dakota	NA	NA	NA	NA	NA
Tennessee	NA	NA	NA	NA	NA
Texas	0.28	NA	0.58	0.86	1.28%
Utah	NA	NA	NA	NA	NA
Vermont	2.64	Shared w/ EE	NA		2.64
Virginia	NA	NA	NA	NA	NA
Washington	NA	NA	NA	NA	NA
West Virginia	NA	NA	NA	NA	NA
Wisconsin	1.21	0.04	1.18	2.43	3.97%
Wyoming	NA	NA	NA	NA	NA