



Legislative Fiscal Bureau

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Joint Committee on Finance

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Wisconsin Development Fund -- Renewable Energy Grants and Loans (Commerce -- Economic Development)

Base Agency

[LFB 2007-09 Budget Summary: Page 89, #6]

CURRENT LAW

Under current law, the Wisconsin development fund (WDF) provides financial assistance through the following programs: (a) technology development grants and loans and technology commercialization loans; (b) customized labor training grants and loans; (c) major economic development grants and loans; (d) urban early planning grants; (e) entrepreneurial training grants; (f) Wisconsin trade project; (g) employee ownership assistance grants; (h) revolving loan fund capitalization grants; and (i) the rapid response fund. The technology commercialization grant and loan component programs were incorporated into the WDF, by 2005 Wisconsin Act 25 (the 2005-07 biennial budget). The component programs include: (a) technology assistance grants; (b) matching grants and loans; (c) bridge grants and loans; (d) venture capital grants and loans; and (e) entrepreneurial and technology transfer center grants. Early planning grants, entrepreneurial training grants, and technical assistance grants are administered by the Wisconsin Entrepreneurs' Network, with funding and oversight from Commerce. Commerce also makes business employees skills training (BEST) grants through the WDF.

The WDF is funded through a general purpose revenue (GPR) and a program revenue (PR) repayments appropriation. The program revenue repayments appropriation was established to operate similar to a revolving loan fund. Amounts received from WDF loan repayments are credited to the repayments appropriation and these monies can be used to fund WDF grants and loans. Base level funding for WDF grants and loans is \$7,098,400 GPR and \$4,050,000 PR.

GOVERNOR

Create, under the Wisconsin Development Fund (WDF), a renewable energy grants and loans program to fund the development of new renewable energy technologies. A biennial SEG appropriation would be created and \$15.0 million SEG each year in recycling fund revenues would be provided for grants and loans. A separate annual administrative appropriation would be established and recycling fund revenues of \$50,900 in 2007-08 and \$57,800 in 2008-09, with 1.0 position would be provided to administer the grant and loan program.

DISCUSSION POINTS

1. In late September, 2006, the State of California enacted legislation to reduce greenhouse gas emissions, such as carbon dioxide, by 25% by 2020. In the 2007 State of the Union address to Congress, the President proposed reducing gasoline usage in the U. S. by 20% below projected annual usage in 10 years, and to require oil companies to use 35 billion gallons of renewable and alternative fuels by 2017. Along with Governor Doyle, each of the Governors in the surrounding states of Michigan, Illinois, Iowa, and Minnesota, have proposed major energy policy initiatives in the past six months. These proposals reflect a growing focus on energy issues that has developed in the past few years.

Starting in the mid-1990's a number of factors began to converge that eventually led to the current state government activities related to energy policy. Although climate change first emerged as a public policy in 1988, it remained essentially a hypothesis until 1995. In 1995, the United Nations Intergovernmental Panel on Climate Change (IPCC), after years of study, issued a report asserting that the balance of evidence suggested that human activity was increasing the planet's temperature and it would be a serious problem. Much scientific research continued after the report, including IPCC reports that were issued in 2001 and 2007, and the findings essentially corroborate the 1995 report. The 1995 consensus report's scientific findings were the basis for the Kyoto Protocol to reduce greenhouse emissions which was proposed in 1997, and took effect in 2005.

In late August of 2005, hurricane Katrina hit the city of New Orleans and the Gulf coast causing more than 1,000 deaths and \$200 billion in damages. Katrina was the most severe of 15 hurricanes during a season that was remarkable for its early beginning, number of storms (27), and the intensity of the hurricanes. Many wondered if global warming was a factor. Evidence suggests that by increasing sea surface temperatures global warming can increase the intensity of such storms. The following year, the documentary "An Inconvenient Truth" was released. The devastation wrought by the hurricanes and the widely viewed documentary helped make global warming a public policy issue. In a January, 2007, Pew Research poll, 77% of respondents indicated that they believed the earth was warming and that it was very or somewhat serious. A March, 2006, ABC poll found that 68% of the participants believed the government should do something about global warming.

Since the 2001 recession, oil prices have trended steadily upward. Prices have risen from

about \$25 a barrel in early 2002 to about \$60 a barrel currently. The Department of Energy projects that prices will exceed \$65 a barrel this summer. Political instability in the Middle East, increasing demand for oil from developing countries, particularly China and India, and strike-related slowdowns have reduced production in Venezuela. This has reduced worldwide spare productive capacity. Between mid-2002 and March, 2003, spare capacity dropped from over 6 million barrels a day to below 2 million a day. At the same time, the country's dependence on foreign oil has increased. In 1985 the United States imported 27.8% of the oil it consumed. Currently, the U. S. imports about 67%. There are widespread concerns among policy-makers at all levels of government about the economic and national security implications of the country's dependence on foreign oil. In the state of the union address, the President said that the dependence on foreign oil makes the United States more vulnerable to hostile regimes and terrorists who could cause huge disruptions of oil shipments, raise the price of oil, and harm the economy.

2. The definition of renewable energy and how to distinguish it from nonrenewable sources can be a subject of much debate. The specific terms and definitions chosen can have significant impacts on policy and regulatory efforts related to renewable energy. A general definition would be energy derived from resources that are naturally regenerated, directly or indirectly from the sun, or from other natural sources, and that cannot practically be depleted. Renewable energy does not include energy from fossil fuels, waste products from fossil sources, or waste products from inorganic substances. Typically, renewable energy is defined by the sources of energy, such as wind or solar power. There is no specific definition of renewable fuel or energy provided in SB 40 for the renewable energy grants and loans program.

For purposes of meeting the state's renewable energy portfolio standard for electric utilities and cooperatives, electricity must be derived from any of the following: (a) a fuel cell that uses a renewable fuel; (b) tidal or wave action; (c) solar thermal electric or photovoltaic energy; (d) wind power; (e) geothermal technology; (f) biomass; and (g) a hydroelectric power resource with a capacity of less than 60 megawatts. The renewable portfolio standard requires electric utilities and cooperatives to sell a minimum, specified amount of electricity from renewable resources to their customers by certain dates.

Typically, the primary renewable energy sources include: (a) solar photovoltaic and thermal; (b) wind; (c) biomass; (d) biofuels; (e) hydro power; and (f) geothermal. Ocean energy conversion such as tidal energy is more limited in its application. Hydrogen and hydrogen fuel cells are also described as potential renewable energy sources, but other sources of energy (renewable or nonrenewable) are required to produce the hydrogen.

Wind. Wind energy uses the force of moving air to power wind turbines/generators. Units usually consist of a tower, rotor (the blades, hub and shaft), gear box, generator, control equipment, and power conditioning equipment. Wind energy systems produce electricity by using the rotational energy of the rotor to drive a generator/turbine. A gearbox is normally used in larger machines to increase generator speed. The power capacity of wind turbines has increased dramatically in the last twenty years, from 24kW (kilowatts) in 1981 to 4 to 6 MW in 2006 (megawatts) in 2006. Through 2005, there were about 59,000 megawatts of total installed capacity of wind power worldwide,

enough electricity to meet the needs of about 20 million homes. Two-thirds of installed capacity is in Europe, primarily Germany, Spain, and Denmark. In Denmark, and some areas of Germany and Spain, wind power meets more than 20% of electricity requirements.

In the United States, wind-power generating capacity increased 27% in 2006, to 11,603 MW, according to the American Wind Energy Association. Wind power capacity is expected to increase an additional 26% in 2007. State renewable portfolio standards for electric utilities and the federal production tax credit of 1.9 cents per kilowatt hour have helped spur wind power development, and wind power generated electricity is becoming competitive with fossil fuels. Production costs can be as low as 3 cents to 4 cents a kilowatt hour, but are more typically 6 cents to 9 cents, not counting subsidies. For 2005, the average cost of production for electric utility plants was 3 to 5 cents per kilowatt hour for natural gas fired plants, and 5 to 7 cents per kilowatt hour for coal fired plants. However, wind power accounts for less than 1% of electricity produced in the country. Location, wind speed, and capital costs affect wind power as a viable source of energy.

Production costs of 3 cents to 4 cents a kilowatt hour only apply to sites with the best wind conditions. In some places with less wind, production costs can be as high as 20 cents a kW hour. In addition, the power grid requires a flexible back-up power source to offset the intermittent nature of wind. Wind farms are located in areas where winds are most favorable, which may not be convenient for connection with transmission lines. High capital costs are currently a problem. A shortage of turbines, along with a weak dollar, have caused prices to increase in recent years. However, some manufacturers have recently increased production. Finally, wind turbines in certain locations have killed a large number of birds and bats.

Solar. Solar power uses the heat of the sun to produce electricity and for water and home heating. A variety of technologies are used including thermal, photovoltaics, and concentrating solar power plants.

Solar thermal systems collect sunlight to generate heat using collectors made of steel, glass, or plastic. The systems are comprised of a collection component, working fluid circulation system, storage component, and controls. Natural gas or electricity is used for backup when the sun is not shining. Residential solar water heating systems initially cost between \$1,500 and \$3,500, compared to \$150 to \$450 for electric and natural gas water heaters, and typically pay for themselves in 4 to 8 years through fuel savings, while system life ranges from 15 to 40 years. Solar space heating systems are more expensive than solar water heating systems. Solar heating is much more prominent in Europe and China than in the U. S. Over 1.5 million homes and businesses in the U. S. use solar water heating. However, only about 8% of the systems are used for water and space heating; most are used to heat swimming pools.

Solar cells, also known as photovoltaic cells, or PVs, use semiconductor materials to convert sunlight into electric current. The solar cell is specially treated to give one layer a negative charge and the other layer a positive charge when sunlight enters the structure. This sets up a cell barrier between semiconductor layers, creating a current and voltage across the cell. Linked cells provide electricity in the form of direct current at 12 or 24 volts. Solar cells can be made from a range of

materials, from the traditional multicrystalline silicon wafers that predominate to thin-film silicon cells and devices composed of plastic or organic semiconductors. Solar photovoltaics can be installed in many places, from housetops to clothing, and are the most economical way to provide electricity in some cases, particularly for small-scale devices like roadside call boxes. However, most solar electricity is generated and consumed at a single site. A study by the New Jersey Board of Public Utilities determined that the cost of installing a 10 kilowatt-capacity system on a house was about \$77,500. The estimated payback period was 50 years without subsidies, and 9.6 years with them. The cost of generating electricity with PVs in the U. S. is 26 cents to 35 cents per kilowatt hour, according to the U. S. Solar Energy Industry Association. Global grid-connected PV capacity increased 55% in 2005, but still represented less than 0.5% of total generating capacity from all sources. Japan and Germany are the leading countries in total PV installations, while Kenya has the most per capita. Although PV modules produce no emissions from operation, toxic substances, such as cadmium, arsenic, and phosphate are used in manufacturing PV technologies.

Large desert-based power plants use huge arrays of mirrors or solar dishes to track the sun and collect heat to make electricity. Natural gas or other fuels can provide supplementary heating when the sun is inadequate. Four concentrating solar technologies are being developed--parabolic trough technologies, central receiver (tower) systems, dish systems, and concentrating photovoltaic systems. To date, parabolic trough technology has provided the best performance and lowest cost. Nine plants have operated in California's Mojave Desert since the mid-1980's, and several others are being planned in the U.S. Southwest. Generating costs have dropped from 45 cents a kilowatt hour to 9 to 12 cents a kilowatt hour (without subsidies), which is competitive with peak power prices from fossil fuel plants.

Biomass. Biomass refers to carbon-based (organic) material, which can be converted to energy, ultimately through some form of combustion. Basically, chemical energy stored in biomass through photosynthesis is released through combustion and the heat energy produced can be used directly, such as steam, or can be converted into mechanical or chemical energy. Biomass conversion covers a range of technologies and feedstock (fuel). Biomass can be burned directly to produce steam; it can be co-fired with fossil fuels; and it can be gasified to produce steam and electricity or for use in microturbines or fuel cells. In addition, methane gas captured from the decomposition of landfill waste and animal manure can be used to produce electricity. Biomass feedstock, can include practically any hydrocarbon, and includes wood and wood waste, agricultural crop residues, aquatic plants, municipal solid waste and sludge.

Biomass provides about 2% of electricity in the U.S. Most biopower is used by the forest products industry, which produces steam and power with process residues, such as wood waste and black liquor, a pulp byproduct. More than 100 coal-fired power plants burn biomass together with coal, which can be substituted for from 2% to 5% of coal at a low incremental cost. However, biomass plants are typically about one-tenth of the size of a conventional fossil-fuel power plant, and equipment costs are high relative to the amount of power produced. Biomass power plants generate electricity at about 5 cents to 10 cents a kilowatt hour, without subsidies.

There is concern that, depending on the feedstock and farming techniques used, biomass

can have a negative effect on soil and water quality, and even increase greenhouse gas emissions. A related concern is ensuring that the net energy balance of using biomass is positive--whether the energy contained in the biomass exceeds the energy, particularly from fossil fuels, required to make it. Low yielding crops grown and processed using fossil fuel energy inputs, and non-sustainable farming techniques for biomass that must be transported long distances could have such an effect. In addition, burning biomass produces carbon dioxide and particulate matter. However, if sustainable feedstock is used and cultivated using certain methods, biomass crops will absorb carbon dioxide as they grow, and sequester carbon in the soil, reducing carbon dioxide in the air, and also reduce soil erosion and runoff. When burned with coal, biomass can significantly reduce emissions of sulfur dioxide, carbon dioxide and other greenhouse gasses that would be generated. Burning biomass that would be placed in landfills reduces the amount of organic waste that would otherwise decompose, and release methane, which is more potent than carbon dioxide. Pollution control technologies can remove biomass particulate matter from smokestack emissions.

Biofuels. Biofuels are liquid fuels derived from crops and agricultural wastes. There is a wide variety of potential sources for producing biofuels, from animal byproducts to corn stalks, but three fuels have emerged as leading biofuels--conventional ethanol, cellulosic ethanol, and biodiesel.

Conventional Ethanol. Generally, conventional ethanol is created by leaching simple sugars from plant matter and fermenting them into alcohol, just like the process for making "corn liquor" or moonshine. Since conventional ethanol relies on simple sugars, it works best when derived from crops that concentrate starches in their seeds. As a result, corn is a better feedstock than grains like wheat, but not as good as sugarcane. Because only a small portion of each plant is used to produce ethanol, a lot of biomass goes unused in the process. The primary feedstock for ethanol in the U.S. is corn, which accounts for about 95% of the ethanol produced in the country.

Ethanol is typically blended with gasoline for use as a transportation fuel. In 2006, ethanol was used in at least 30% of U. S. gasoline. The most common blend is 10% ethanol, or E10, which can be used by all types of engines and vehicles that require gasoline. Ethanol can be used in higher concentrations up to 85%, or E85, in "flexible-fuel" vehicles that have slight engine modifications. Ethanol can be blended at low concentrations as a fuel oxygenate and is being used in gasoline as a replacement for methyl tertiary butyl ether (MTBE), an emission reducing additive, which is a suspected carcinogen. U.S. ethanol production doubled between 2000 and 2005, reaching 3.9 billion gallons in 2005. Production is estimated to have increased to 4.8 billion gallons for 2006, the largest annual increase in production. The federal Energy Policy Act of 2005 includes a renewable fuel standard requiring fuel suppliers to use 7.5 billion gallons of renewable fuels by 2012. For 2006, the requirement was 4.0 billion gallons. However, even with the recent growth in production, ethanol represented about 3% of total U.S. motor vehicle fuel in 2006.

The cost of producing ethanol primarily depends on the cost of corn and the energy, typically natural gas, used in the manufacturing process. According to the Government Accountability Office (GAO), the cost of producing ethanol from corn is between \$0.90 to \$1.25 per gallon, depending on the plant size, transportation cost for corn, and the type of fuel used in

production. Ethanol is purchased at the refinery or terminal level where ethanol blenders receive a 51 cents per gallon federal income tax credit. The largest ethanol processor is Archer Daniels Midland, which processes about 40% of the ethanol produced in the U.S. The price of ethanol generally follows the price of gasoline. According to a Wall Street Journal report, on February 9, 2007, the price of ethanol for March delivery closed at \$2.06 gallon on the Chicago Board of Trade, compared to \$1.61 a gallon for gasoline on the New York Mercantile Exchange.

Cellulosic Ethanol. Cellulosic ethanol is a fuel that is chemically identical to conventional ethanol, but is produced from biomass including waste materials like corn stover and paper pulp, and fast-growing plants like switchgrass, willow and poplar. The fuel is not produced solely from sugars and starches, as with corn ethanol. There are three basic steps to cellulosic ethanol production: (a) pretreating the material to break cellular bonds (b) converting cellulose to sugars, and (c) fermenting sugars into ethanol. About two-thirds of cellulosic matter is complex carbohydrate, which can be broken down into fermentable sugars, and then into ethanol. However, conversion is currently an expensive and water-intensive multi-stage process. Some research is attempting to genetically engineer a single organism to both break down cellulose into simpler sugars and to ferment alcohols. Other research is focused on improving methods for converting biomass into ethanol using heat and catalysts.

The U.S. Department of Energy estimates that it costs about \$2.20 per gallon to produce a gallon of cellulosic ethanol. Cellulosic plants yield less ethanol than corn per ton of feedstock, and enzymes that break down cellulosic plant tissue cost 30 to 50 cents per gallon of ethanol, compared to 3 cents a gallon for corn.

Biodiesel. Biodiesel is diesel fuel produced from soybean, palm, or oil-seed plants, such as canola or mustard, and also from waste animal and vegetable fats. The most common sources for biodiesel production in the U. S. are soybean oil and yellow grease (primarily recycled cooking oil from restaurants), with soybeans being the predominant feedstock. Biodiesel can be produced by several processes. Vegetable oils or fats can be converted to fatty acids, which are in turn converted to esters (organic fuel compounds). Oils or fats can also be converted directly into esters, using an acid or base to accelerate the transesterification process. The most common method of producing biodiesel is to react animal fat or vegetable oil with methanol in the presence of sodium hydroxide. This reaction produces methyl esters and glycerine.

Biodiesel can be blended with ordinary diesel fuel at any concentration. Most diesel vehicles can run on blends of up to 20% with few or no modifications. Between 1999 and 2005 biodiesel production in the U. S. increased from 500,000 gallons to 75 million. The DOE, Energy Information Administration (EIA), estimates that constant dollar production costs in 2006 for biodiesel will be \$2.47 per gallon for soybean-based diesel and \$1.38 a gallon for yellow grease diesel, compared to 77 cents for petroleum based diesel. Depending upon the amount of soybean oil used, the price of soybean oil is projected to be between \$1.87 and \$2.15 a gallon in constant dollars in 2006. Yellow grease is estimated at \$1.05.

Biofuels, particularly ethanol, are not without detractors. For years, certain critics have claimed that the non-renewable energy required to grow and convert corn into ethanol is greater

than the energy value present in the ethanol. A 2003 study concluded that more energy was used to produce a gallon of ethanol than the energy in the ethanol (Pimentel), and a 2005 study found similar results for other biomass feedstock (Pimental and Patzek). A recently published report (Jacobson, 2007) found that switching from gasoline to ethanol for vehicle transportation would raise ozone levels everywhere in the country except the southeast. There are also concerns that rapid expansion of biomass plantings could result in topsoil erosion, pollution of surface and groundwater with pesticides, and fertilizer runoff. However, most energy balance studies of ethanol have found a positive balance (Shapouri, Dufield, and Wang 2002; Kammen et al, 2006; Wang, Argonne National Laboratory/National Renewable Energy Laboratory, 2005). Two of those studies (Kammen, 2006; Wang ANL/NREL, 2005) also report that switching to ethanol for transportation fuels would reduce green house gas emissions. In general, the findings are dependent on assumptions made about the components of the production process, and how the components are measured.

Hydropower. Hydropower uses the natural energy of falling or flowing water to produce electricity or mechanical energy. The potential and kinetic energy of water is converted to electricity using a hydraulic turbine/generator. In typical hydropower systems, water is conveyed through a pipeline or canal to the turbine. The energy in the water is used to rotate the turbine generator, and leaves the turbine at a lower pressure. Power generation is increased by the height of the water elevation, the flow of the river or stream, and the size of the watershed. The industry is characterized by high up-front costs, and the licensing process can be long and costly. There are no federal tax incentives for hydropower.

Hydropower accounts for about 20% of world electricity production, and represents between 7% and 10% of U.S. electrical power. Of the 80,000 dams in the U.S., only 3% are used to generate electricity. Most of the nation's hydropower comes from large-scale facilities. Hydropower dams can cause sedimentation of rivers and streams, disruptions of fish migrations, and alteration of habitat.

Geothermal. Geothermal energy systems are designed to bring underground heat to the earth's surface and convert it to useful forms. Geothermal heat is converted into electricity through a number of methods. Generally, producers drill into the ground to release naturally generated steam and heat that is trapped in the earth. The released steam or water is used to power a turbine/generator producing electricity. Liquids are re-injected into the ground to continue the process. The amount of electricity generated depends upon many factors, including the size of the geothermal field, water pressure and temperature, and the speed of heating and releasing water. The highest temperature resources can be used for electricity generation. Hydrothermal systems, which transfer geothermal energy to power stations via steam, are the primary technology currently used. But geo-pressured, hot dry rock, and magma technologies are being developed. Most of the U.S. has near constant ground temperatures suitable for geothermal heat pumps, which use the earth or groundwater as a heat source in winter and a heat sink in summer to regulate indoor temperatures. More than 600,000 geothermal heat pumps are in operation.

Through 2005, worldwide geothermal electric capacity totaled 8,932 MW in 24 countries. The U. S. is the world leader in geothermal electric and thermal heat installed capacity, with over

2,800 MW of power capacity operating in California, Hawaii, Nevada, and Utah. The biggest developed field is 72 miles north of San Francisco, and generates an amount of electricity in excess of one and one-half conventional power plants. Currently, geothermal electricity costs about 6 cents to 10 cents a kilowatt hour. Extracting geothermal energy is nearly emissions free, but small amounts of hydrogen sulfide, carbon dioxide, and other gases can be released.

Hydrogen. Hydrogen is the most abundant element in the universe, but it does not exist by itself on earth. Hydrogen can be produced from a wide variety of resources including coal, oil, natural gas, biomass, and water. About 95% of hydrogen in current use is produced from reforming natural gas. The remainder, high-purity hydrogen from water electrolysis, is primarily generated by burning fossil fuels. Hydrogen as a renewable resource would be generated through a sustainable cycle of production and use. The first stage would produce hydrogen from renewable resources, such as photoelectrolysis of water, in which the energy from the sun is used to convert water into hydrogen and oxygen. The hydrogen is then used to power a fuel cell, in which hydrogen and oxygen from air recombine to produce electricity, heat, and water. This cycle produces no pollution and no greenhouse gases. Several options for producing hydrogen from renewable resources are being explored, including biomass conversion, electrolysis using electricity from renewable resources, particularly from wind energy, and direct water-splitting using micro-organisms or semi-conductors. Some technologies are at the demonstration stage, while others will require long-term research and development (R & D) commitments.

According to figures published in Wisconsin Energy Statistics, 2006, (published by the Department of Administration, Division of Energy) renewable energy sources accounted for 4.5% of resource energy consumption, and 5.6% of end use energy consumption in 2005. Resource energy includes all energy resources used to generate electricity, including the energy content of coal, petroleum, nuclear, and renewable fuels. End use is the energy content of electricity and other fuels at the point of use by customers. Since much of the energy needed to generate electricity is lost in the process, end use energy consumption figures will always be lower than the directly linked resource energy consumption figures. Tables 1 and 2 show resource energy use and end use consumption for 2000 through 2005, respectively, for Wisconsin, by type of fuel. The tables show that renewable resource energy consumption has remained somewhat steady, ranging from 4.0% in 2000, to 4.5% in 2005. Renewable end use energy consumption has generally shown a gradual increase from 4.6% in 2000 to 5.6% in 2005. Table 3 shows state renewable energy use by type of fuel from 1995 to 2005. The table shows that the predominant renewable resource use in Wisconsin is wood burning for space and process heat. Total renewable energy usage in the state increased 5.7 % in 2005 primarily because of increased use of wood and ethanol. The use of other renewable energy sources, such as solar and wind power, has remained fairly constant since 2000. Table 4 shows renewable energy use by economic sector. The residential and industrial sectors used about 40% and 30%, respectively of total renewable energy used in the state in 2005. Finally Table 5 shows the production of ethanol and the use of ethanol in various forms of gasoline in the state since 2002. Note that the amount of ethanol produced in Wisconsin does not necessarily equal the amount used. Wisconsin ethanol production increased 60.7% in 2005 as a result of the ethanol plant in Friesland becoming operational, and increased production at three other plants located in Oshkosh, Monroe, and Stanley.

TABLE 1

Wisconsin Resource Energy Consumption, By Type of Fuel, 2000 - 2005
(Trillions of BTU)

Fuel Type	2000		2001		2002		2003		2004		2005*	
	Amount	Percent										
Petroleum	503.4	29.71%	506.0	29.91%	516.6	29.64%	518.3	29.50%	528.0	29.89%	520.9	29.17%
Natural Gas	392.0	23.13	360.1	21.29	384.3	22.05	394.0	22.43	381.6	21.61	404.7	22.66
Coal**	519.4	30.65	521.9	30.85	508.5	29.18	527.0	30.00	537.0	30.40	536.6	30.05
Renewables***	68.0	4.01	70.0	4.14	73.4	4.21	74.2	4.22	76.8	4.35	81.1	4.54
Nuclear	124.3	7.34	124.3	7.35	134.4	7.71	131.9	7.51	128.4	7.27	98.7	5.53
Electric Imports****	87.4	5.16	109.3	6.46	125.7	7.21	111.4	6.34	114.4	6.48	143.8	8.05
Total	1,694.5	100.00%	1,691.6	100.00%	1,742.9	100.00%	1,756.8	100.00%	1,766.2	100.00%	1,785.8	100.00%

* Preliminary Estimates

** Including petroleum coke

*** Renewables includes solar, wind, wood, biogas, bio solid waste, and hydroelectric

**** Electric imports are the estimated resource energy used in other states or Canada to produce the electricity imported into Wisconsin

Source: Wisconsin Energy Statistics 2006, Wisconsin Department of Administration, Division of Energy

TABLE 2

Wisconsin End Use Energy Consumption, by Type of Fuel, 2000 -2005
(Trillions of BTU)

Fuel Type	2000		2001		2002		2003		2004		2005*	
	Amount	Percent										
Petroleum	501.8	41.87%	504.7	42.98%	513.5	42.25%	517.1	42.08%	526.5	42.64%	519.1	42.02%
Natural Gas	372.4	31.07	337.5	28.74	363.6	29.91	369.7	30.09	360.2	29.17	354.8	28.72
Coal**	48.0	4.00	50.3	4.28	51.3	4.22	50.5	4.11	51.8	4.20	52.2	4.23
Renewables***	55.6	4.64	56.6	4.82	58.4	4.80	62.0	5.05	64.1	5.19	69.3	5.61
Electricity	220.8	18.42	225.2	19.18	228.7	18.82	229.5	18.68	232.2	18.80	240.1	19.43
Total	1,198.6	100.00%	1,174.3	100.00%	1,215.5	100.00%	1,228.8	100.00%	1,234.8	100.00%	1,235.5	100.00%

* Preliminary Estimates

** Including petroleum coke

*** Renewables includes solar, wind, wood, biogas, bio solid waste, and hydroelectric

Source: Wisconsin Energy Statistics 2006, Wisconsin Department of Administration, Division of Energy

TABLE 3

Wisconsin Renewable Energy Use, by Type of Fuel, 2000 - 2005
(Trillions of BTU)

Fuel Type	2000		2001		2002		2003		2004		2005*	
	Amount	Percent										
Hydro	8.6	12.65%	8.8	12.59%	10.8	14.71%	7.9	10.65%	8.5	11.05%	7.8	9.61%
Wood	39.7	58.38	41.6	59.51	42.0	57.22	44.3	59.70	45.8	59.56	48.9	60.22
Bio-Solid Waste**	3.9	5.74	3.9	5.58	3.7	5.04	3.8	5.12	4.0	5.20	3.8	4.68
Solar	4.1	6.03	4.1	5.87	4.1	5.59	4.1	5.53	4.1	5.33	4.1	5.05
Biogas	3.3	4.85	3.5	5.01	4.3	5.86	4.5	6.06	4.7	6.11	5.2	6.40
Ethanol***	7.9	11.62	7.3	10.44	7.4	10.08	8.5	11.46	8.7	11.31	10.4	12.81
Wind	<u>0.5</u>	<u>0.74</u>	<u>0.7</u>	<u>1.00</u>	<u>1.1</u>	<u>1.50</u>	<u>1.1</u>	<u>1.48</u>	<u>1.1</u>	<u>1.43</u>	<u>1.0</u>	<u>1.23</u>
Total	68.0	100.00%	69.9	100.00%	73.4	100.00%	74.2	100.00%	76.9	100.00%	81.2	100.00%

* Preliminary Estimates

** Includes municipal and solid waste

*** Ethanol is blended with a petroleum-based fuel to produce reformulated gasoline or gasohol

Source: Wisconsin Energy Statistics 2006, Wisconsin Department of Administration, Division of Energy

TABLE 4

Wisconsin Renewable Energy Resource Use, by Economic Sector, 2000 - 2005
(Trillions of BTU)

Sector	2000		2001		2002		2003		2004		2005*	
	Amount	Percent										
Residential	7.2	40.06%	26.3	37.57%	26.7	36.38%	29.3	39.49%	29.9	38.93%	32.4	39.95%
Commercial	3.24	2.0	2.86	2.0	2.72	1.8	2.43	1.8	2.34	1.8	2.22	1.8
Industrial	8.3	26.95	21.1	30.14	22.3	30.38	22.4	30.19	23.8	30.99	24.7	30.46
Electric Utility	12.3	18.11	13.3	19.00	15.0	20.44	12.2	16.44	12.6	16.41	11.8	14.55
Transportation	7.9	11.63	7.3	10.43	7.4	10.08	8.5	11.46	8.7	11.33	10.4	12.82
Total	7.9	100.00%	70.0	100.00%	73.4	100.00%	74.2	100.00%	76.8	100.00%	81.1	100.00%

* Preliminary Estimates

Source: Wisconsin Energy Statistics 2006, Wisconsin Department of Administration, Division of Energy

TABLE 5

Wisconsin Production and Use of Ethanol, 2002-2005
(Thousands of Gallons)

Year	Total Production	Reformulated		E-85**	Total Use
		Gasoline	Gasohol*		
2002	15,529	71,152	17,026	48	88,226
2003	76,947	77,302	23,536	86	100,924
2004	106,886	74,816	27,617	706	102,539
2005	171,764	73,046	49,186	723	122,955

* Gasohol is a motor fuel blend consisting of 10% ethanol and 90% conventional gasoline.

** E-85 is a motor fuel consisting of 85% ethanol and 15% gasoline.

Source: Wisconsin Department of Revenue; Wisconsin Department of Administration, Division of Energy, West Shore Pipeline.

As previously discussed, three recent issues have moved energy policy back to the forefront of policy debate:

a. Economic Concerns. U. S. economic performance may be constrained by persistently higher world oil prices. The current economic expansion, which began in November, 2001, has underperformed when compared to the average economic indicators for post World War II expansions. For example, between 2001 and 2006, real wages and salaries increased at a 1.9% average annual rate, compared to a 3.8% average for previous recoveries. The average real rate of growth for total compensation has been 2.5% for the current recovery, less than the 4.1% increase for prior expansions. Employment increased an average of 0.9% per year since November, 2001. The average for previous economic recoveries is 2.4%.

b. Climate Change. Scientific findings have increasingly indicated that the earth is moving closer to several tipping points that could make it impossible to avoid irretrievable damage to the earth's habitability for humans. The 2007 IPCC report indicated that: (a) the amount of carbon in the air is accelerating; (b) nonhuman causes, as explanations for some of the warming, are relatively negligible; and (c) heavy rainfalls are becoming more common, cold days and frost have become less common, and hot days and heat waves have become more frequent. The report projects the effects of sea-level increases in creating refugees, increases in temperature and humidity on malaria-carrying mosquitoes, and of heat waves on crop losses. The study recommends an immediate and sharp reduction in greenhouse gas emissions.

c. Oil Security. Concerns have intensified about dependence on Middle Eastern oil, while diplomatic frictions have increased tensions between the U. S. and key oil exporters, such as Venezuela and Iran. In October, 2006, the Council on Foreign Relations issued a study, National Security Consequences of U. S. Oil Dependency, that indicated that America's dependence on imported energy increases its strategic vulnerability and constrains its ability to pursue foreign policy and national security objectives. The study recommended that the U. S. should begin the transition to an economy that relies less on petroleum. Five major reasons were identified as why dependence on energy traded in world markets is a matter of concern: (a) control over enormous oil revenues gives exporting countries flexibility to adopt policies opposed to U.S. interests and values; (b) oil dependence causes political realignments that constrain the ability of the U.S. to form partnerships and achieve common objectives; (c) high prices and seemingly scarce supplies create fears that the current system of open markets is unable to secure supply, leading to oil and gas deals that include political alignments; (d) revenues from oil and gas exports can undermine local governance, and lead to corruption and mismanagement; and (e) a significant interruption in oil supply will have adverse political and economic consequences for the United States and other importing countries. Included among a wide ranging number of recommendations is increased investment in new energy technologies.

3. In theory, a market economy achieves a social optimum without government intervention, because competitive market prices transmit, to both consumers and producers, accurate signals of the benefits and costs to others of the goods or services they respectively produce and consume. A competitive market equilibrium, in which all social costs and benefits are either

internalized by firms or consumers, or are transmitted to them as market prices, has no alternative allocation of resources that could make one person better off without hurting someone else. However, there are reasons why prices might fail to reflect actual costs that are typically referred to as market failures or distortions. In these cases, the failure of prices to accurately reflect social costs means that something other than a free-market outcome would be optimal. Government policies that can redirect the economy toward the preferred outcome may be desirable.

An example of such a distortion is an externality where the production of a good causes harm to the environment in a way that lowers the welfare of people, other than those who produce and consume the product. The true cost of producing the good would include the cost to society of the environmental damage. In this case, price will not signal the true social cost of the good, and the firm will produce too much. Governmental policy in such cases would be to levy a tax or subsidy on the behavior of the private sector entities involved in order to change their costs to the true social costs. Market failures can also arise due to asymmetries of information, which can lead to levels of employment or investment below an optimal level. In these cases, a policy of subsidizing these activities may be beneficial.

4. The policy goals of energy security, mitigation of climate change, environmental protection, and economic development have been used to justify government subsidies for renewable energy development. The federal government provides tax credits, grants, and loans to support various types of renewable energy. A 2006 study found that a total of \$111 billion in federal incentives was provided to the renewable energy industry between 1950 and 2003 (Bezdek and Wendling, 2006). During the same period, the oil industry received \$302 billion, the coal industry \$81 billion, the natural gas industry \$87 billion, and the nuclear power industry \$63 billion. However, some studies have found that the current government policies for renewables do not provide sufficient incentives to achieve policy goals (Gan, Eskland, Kolshus, 2005). Based on long run cost projections and assuming mature technologies and economies of scale, one study found that renewable technologies would possess a significant cost advantage, if the externalities of fossil fuel power production were internalized (Owen, 2004).

A study conducted by the Renewable Energy Project for the state of Pennsylvania in 2006, analyzed the effects of developing a "wedge" (production of renewable energy power sufficient to stabilize electric power company emissions) of renewable energy to stabilize emissions in the U. S. electric sector. The study concluded that such a nationwide program would create demand for billions of dollars of components and new markets for domestic manufacturers that are already producing equipment similar to the components that that go into new renewable energy generation. It was estimated that nationwide renewable energy development would generate \$160.5 billion in investment and create over 850,000 new jobs (Sterzinger, Stevens, 2006). A report produced by the Renewable and Appropriate Energy Laboratory at the University of California-Berkeley reviewed and analyzed 13 independent reports and studies that measured the economic and employment impacts of the clean energy industry in the United States and Europe. It concluded that the renewable energy sector generated more jobs than the fossil fuel energy sector per unit of energy delivered, and that the employment rate in fossil fuel-related industries has been declining steadily (Kammen, Kapadia and Fripp 2006). However, the study noted that some sectors and regions

would be negatively affected by a restructuring of the energy industry.

5. The level of public and private investment in energy research and development in the U.S. has declined about \$1.0 billion since the mid 1990's. Across almost every energy technology category, in both public and private sectors, and at multiple stages of innovation process investment has either been stagnant or declining. The decreased spending on energy R&D has occurred while overall R & D spending in the U.S. has increased about 6% per year. The percentage of total national R & D spending invested in the energy sector has decreased from 10% in the 1980's to 2% in 2006. Business investment in energy R&D dropped 50% between 1991 and 2003. While during the 1980s and 1990s private sector investment in energy R&D represented about 50% of total U.S. investment in energy R&D, in 2006, private business investment represented 24% of total national energy R&D investment.

One study using patent activity as a proxy for inventive activity in energy technologies found that a long-term decline in patenting across technology categories indicated performance-improving and cost-reducing innovations were occurring with a decreasing frequency (Nemet and Kammen, 2006). Two recent U.S. Government Accountability Office reports provide some support for government funding of renewable energy technologies. A December, 2006, review of federal Department of Energy (DOE) R&D activities recommended that, in order to meet the nation's rising demand for energy, reduce its economic and national security vulnerability to crude oil supply disruptions, and minimize adverse environmental effects, Congress should consider further stimulating the development and deployment of a diversified energy portfolio by focusing R&D funding on advanced energy technologies. Similarly, a January, 2007, GAO report about peak oil production (various estimates regarding when world oil production will begin to decline) recommended that a strategy to address the uncertainty of peak oil production should include periodic advice to Congress about likely cost-effective areas where the government could assist the private sector with development and adaptation of alternative energy technologies.

Additional R&D funding could be used for innovations in the following areas: (a) technology refinement and improvement; (b) technology integration; (c) production; (d) demonstration and deployment; (e) mitigation of environmental and social impacts; and (f) new technologies.

However, investments in clean technology (including renewables) has increased substantially in recent years. According to the Cleantech Venture Network, North American venture capital investments grew 78%, from \$1.6 billion in 2005 to \$2.9 billion in 2006. New Energy Finance, a research firm, estimated that venture capital and private equity clean-tech investments grew from \$2.7 billion in 2005 to \$7.1 billion in 2006, or 167%. Studies have found that, in general, venture capital investment is three to four times more effective than R&D at stimulating patenting (Kortum and Lerner, 2000).

Government investment in R&D is supported because an individual business is uncertain about the benefits that will be realized from fundamental research, and that it is not assured of capturing the full value of any innovations that are developed. As a result, the business may invest

less than an amount that would be optimal for society. In addition, government research can produce indirect or spillover benefits for the state. The spinoff products from the Apollo space program research and the Internet are examples. Some could view increased government investment as crowding out private sector investment by raising investment costs, and limiting access to funding and scientists. However, the Nemet Kammen study found that this was not the case. Large government R&D initiatives were associated with higher levels of public and private R&D investments.

6. Earlier this year, Green Mountain Energy, the largest retail provider of "cleaner" electricity (wind, solar, biomass, geothermal, and natural gas powered), abandoned its operations in Pennsylvania. A company spokesperson indicated that wholesale electric prices and state rate caps made Green Mountain Energy customer electricity bills \$30 a month higher than those of regular utility companies. One criticism that is made of renewable energy alternatives is that it will be difficult for renewables to significantly increase market share without a corresponding substantial increase in, and continued provision of government subsidies. EIA estimates that the market share of renewable energy is likely to remain static as a percent of total fuel used in producing electricity through 2030, with renewables growing 1.5% per year, but with no net change in market share. If this projection is accurate, the U.S. economy would remain dependent on fossil fuels for 86% of energy needs, with an increased proportion of foreign imports, and a 35% increase in carbon dioxide emissions. (Global Energy Decisions, 2007). Many renewable energy sources, such as wind and solar, have high up-front capital costs and intermittent availability, particularly when compared to combined-cycle natural gas. Production costs for renewable energy sources can vary by location, and transmission costs are often higher because production sites are distant from transmission lines. Even biomass involves gathering large quantities of feedstock, transporting the feedstock some distance to a production facility, and then storage of large amounts of feedstock at the facility until it is used. Renewable energy sources have a cost structure (high capital and low marginal costs) that is suited to baseload electricity production, but a generation pattern that can be intermittent. Natural gas facilities have relatively lower capital costs and declining marginal costs. (Taylor and VanDoren, 2002).

Another critique of renewable energy is that even if all of the external costs of fossil fuels are internalized, there would be little effect on energy consumption, but overall energy prices would be higher. As previously noted, one rationale for subsidies for renewable energy is that fossil fuel based energy prices do not reflect the true social costs of use, such as climate change and oil dependency. However, some of those costs are included in fossil fuel energy prices through environmental regulation, such as federal Clean Air Act provisions. In addition, from this view, even if such costs were fully included in fossil fuel prices, it would have a marginal effect on consumption. For example, in the eleven weeks through April 23, 2007, gasoline pump prices rose 33%, the fastest gain since the Katrina-influenced 34% six-week increase in August and September, 2005. Yet, during this period, gasoline consumption was increasing twice as fast as in 2006. Similarly, a 2001 study by EIA found that reducing mercury emissions below 1997 levels would not increase renewable energy generation, because the requirement could be met more cost-effectively by retrofitting power plants than by switching to renewable energy technologies. Combined with the impact of other regulations, electricity prices would be an estimated 3% to 4% higher. Conversely,

mandating renewable usage would not ensure renewable targets will be achieved. A 2006 California Energy Commission report indicated that Pacific Gas & Electric and Southern California Edison fell short of 2004 renewable energy procurement goals by 59.8% and 54.2%, respectively. As a result, government support of alternative technologies for secure fuels such as coal and natural gas, and promotion of conservation could be viewed as more efficient.

According to a study from the Center for Energy and Environmental Policy Research at MIT, federal support is most successful in encouraging innovation at the technology creation stage (Deutch, 2005). However, the government has more difficulty in accomplishing or influencing the process of transfer, adoption, and deployment of a new technology. A private firm will adopt new technology only when it believes the innovation will be profitable under anticipated market conditions. In funding projects, the government must take account of the uncertainties of private markets, such as market prices, that send different signals for both the supply and demand for products and services, in addition to considering the uncertainties of the R&D process. One criticism of programs such as the proposed renewable energy grant program is that it would put state government in the position of selecting the best technologies and products for funding rather than market forces.

There is an opportunity cost associated with any use of resources. The funds allocated to the renewable grant program could be used for other purposes. One opportunity cost of government's expenditure of resources is their use in the private sector for consumption and investment. In addition, since the resources could be used by government for a number of purposes, there is an opportunity cost to the government as well. Whether the opportunity cost of specific government use of resources is greater or less than the benefits produced depends upon the specific circumstances. One criticism of the proposed renewable energy grant program would be that the recycling fund revenues could be better used by the private sector to make investments in renewable energy technologies, or in developing more competitive conventional energy sources. In turn, this could save energy consumers money that could be spent elsewhere in the economy. Similarly, the recycling funds could be used to increase municipal and county recycling grants.

7. Commerce administers a number of grant and loan programs that, under current law can be, and have been, used to provide funding to projects for research and development, and infrastructure development and commercialization of renewable energy projects. Programs that can currently be used to fund projects that would also be eligible for the proposed renewable energy grant and loan programs include:

Wisconsin Development Fund. The Wisconsin Development Fund has specific programs designed to provide grants and loans for research and development and infrastructure development and commercialization of new technologies, including renewable energy technologies, at various stages of development. These programs include technology development grants and loans, and technology commercialization grants and loans including: (a) technology assistance grants; (b) matching grants and loans; (c) bridge grants and loans; and (d) venture capital grants and loans. In fiscal year 2005-06 a total of \$3.1 million was awarded through these programs. In addition, funding for renewable energy projects can be provided through other WDF programs such as major

economic development grants and loans. Total annual base level funding for the WDF is \$7,098,400 GPR and \$4,050,000 PR. SB 40 would provide additional WDF funding of \$1,250,000 GPR in 2007-08, and \$2,000,000 GPR in 2008-09.

Rural Economic Development Program. Funding for rural businesses that are developing renewable energy technologies, particularly those related to biomass and biofuels can be provided through the rural economic development program. The program provides loans for working capital, fixed asset financing, construction and expansion, and purchase of land, buildings, and equipment. Base level funding is \$606,500 GPR and \$120,100 PR.

Gaming Economic Development and Diversification Grant and Loans. Certain renewable energy projects would be eligible for funding under the gaming economic diversification grant and loan program. Awards can be used for fixed asset financing for a business to start and expand operations. In addition, funds can be used for land purchases, new construction, remodeling, furniture, fixtures, and equipment. Total annual funding of \$2,538,700 PR in tribal gaming revenues is provided.

Technology Zones. Eight technology zones have been designated encompassing 54 counties. High-technology businesses that locate or expand in a technology zone can claim technology zones tax credits under the state individual income and corporate income and franchise taxes. A high-technology business includes a business engaged in the activities of research, development, or manufacture of advanced products or materials for use in energy. The total number of technology zone tax credits that can be claimed in each zone is \$5.0 million, and \$40 million statewide. As of January 1, 2007, a total of \$18 million technology zones had been allocated to businesses in the state.

Angel Investment Tax Credit. A 12.5% tax credit can be claimed for two years, under the state individual income and corporate income and franchise taxes, for the claimant's angel investment in a qualified new business venture. A business that was engaged in research and development and/or developing a new product or business process, including renewable energy technologies, would be a qualified new business venture. The maximum amount of angel investment tax credits that can be claimed is \$3.0 million annually, and \$30 million in total.

Early Stage Seed Investment Tax Credit. The early stage seed investment tax credit can be claimed under the individual income and corporate income and franchise taxes, and is equal to 25% of the claimant's investment paid in the tax year to a fund manager that the fund manager invests in a qualified new business venture. The maximum amount of tax credits that can be claimed in a tax year is \$3.5 million and the maximum total amount of tax credits that can be claimed is \$35 million.

Wisconsin Entrepreneurs' Network. The Wisconsin Entrepreneurs' Network (WEN) was created to promote entrepreneurship and includes the University of Wisconsin System, the Wisconsin Technical College System, the WiSys Technology Foundation, and the Agricultural Innovation Center. The Network offers a variety of services to entrepreneurs of all industries and stages of development including business planning, educational workshops, executive programs,

peer learning, and access to capital and technology transfer assistance. WEN administers the technology assistance grant program that provides funds for R & D and professional services.

Wisconsin Technology Council. The Wisconsin Technology Council operates the Wisconsin Angel Network which includes a deal flow pipeline (listing of projects that are potential investments) and Internet site that allows angel investors to review potential projects submitted for investment consideration by entrepreneurs.

Renewable Portfolio Standard. Wisconsin currently employs a renewable energy portfolio standard that requires public utility companies to use a certain amount of renewable energy for producing electricity. The renewable energy portfolio standard requires electric utilities and cooperatives to sell a minimum, specified amount of electricity from renewable resources to their customers by certain dates. For 2006 through 2009, current law prohibits each utility and cooperative from decreasing its renewable percentage below its average renewable percentage in 2001 through 2003. Relative to that average, each utility and cooperative is required to increase the amount of renewable energy it sells by an additional two percentage points by 2010, and by an additional six percentage points by 2015.

8. The appendix, which was compiled by the State Office of Energy Independence, identifies state initiatives in Wisconsin and the surrounding states of Michigan, Illinois, Iowa, and Minnesota that provide assistance to projects for developing biofuel, biopower, and bioproducts. The information included in the appendix was compiled from a wide variety of sources and may not be entirely comprehensive. Minnesota recently established a renewable energy standard that requires energy companies to provide 25% of electrical power from renewable sources by the year 2025. Michigan will target \$50 million of its "21st Century Fund" (a fund started with tobacco settlement monies) to research, development, and commercialization of alternative energy companies and projects.

9. Under the provisions of Senate Bill 40, the renewable energy program would provide grants and loans to a business or researcher to fund development of new technologies to increase renewable fuel or energy production, or to fund commercialization of new renewable fuel or energy technologies. Grants could not exceed 50% of the costs of an eligible project. Commerce would be authorized to expend or encumber up to 1.0% of the SEG grant and loan funding for evaluation costs, collection costs, foreclosure costs, and other costs associated with administering the renewable energy grants and loans program. (Commerce has similar authority to use WDF funding from the GPR appropriation for related administrative costs.) The Department would be authorized to promulgate administrative rules necessary to administer the program. However, Commerce would be required to consult with the Department of Agriculture, Trade and Consumer Protection (DATCP), the Department of Natural Resources (DNR), and the Public service Commission.

10. Commerce would be required to award renewable energy grants totaling not more than \$5.0 million to a person who planned to construct a cellulosic ethanol plant in Wisconsin if the following applied:

a. The person submits a plan to the Department specifying the proposed use of the grant, and the Secretary of Commerce approves the plan.

b. The Department enters into a written agreement with the person that specifies the conditions for the use of the grant, including auditing and reporting requirements.

c. The person agrees in writing to submit to the Department, within six months of spending the grant proceeds, a report detailing how the grant proceeds were spent.

11. The bill would delete two programs that have related purposes. First, the Department of Agriculture and Consumer Protection (DATCP) bio-industry grant program would be eliminated, along with the agricultural chemical management fund SEG appropriation that funded the program. One-time funding of \$1.0 million SEG was provided for the program in the 2005-07 biennium. Second, the bill would delete the authority for the Department of Natural Resources (DNR) to award forestry biomass grants from the forestry account of the segregated conservation fund to match federal monies. One-time funding of \$537,500 SEG was provided in the 2005-07 biennium to match anticipated federal forestry biomass grants.

12. The proposed renewable energy grant and loan program would be funded with \$15.0 million SEG in annual recycling fund revenues and an additional \$50,900 SEG in 2007-08 and \$57,800 SEG in 2008-09 and 1.0 SEG position for administration. The use of recycling fund revenues to fund the proposed renewable energy grants and loans program can be viewed as a policy issue. In a general sense, use of renewable resources is a recycling activity because the sources of energy are essentially not diminished in the production process. The process of generating energy does not reduce the amount of renewable resources that will be available in the future. Moreover, some components of municipal solid waste and related methane gases can be used as biomass to generate heat and power and to produce cellulosic ethanol. Paper mills use waste pulp and related products as a local source of energy. These are items that might otherwise be placed in municipal landfills.

However, the recycling fund was created to fund programs and activities specifically designed to support solid waste recycling and waste reduction. Initially, potential revenue sources that were considered, such as container and diaper fees, were tied to sources of municipal solid waste. The Recycling Market Development Board, which existed from 1993-94 through 2003-04, administered a number of programs that were created for the development of markets for materials recovered through recycling and to maximize the marketability of these materials. The Municipal and County Recycling grant program provides grants to responsible units for administering local recycling programs that can include collection, transportation and sorting of recyclables. In addition, The Governor's Task Force on Waste Materials Recovery and Disposal report included several recommendations related to recycling, which included a recommendation that the recycling fund be used only for recycling, beneficial reuse, and waste reduction programs.

13. If recycling fund revenues are determined to be an appropriate source of funding, the Committee may wish to reduce the amount of funding provided. Typically, the Development

Finance board targets 30% (\$3.3 million) of WDF funding for technology development. Providing \$3.3 million in annual recycling funding would provide the same amount for renewable energy technology development. Alternatively, the brownfield grant program administered by Commerce is funded with \$7.0 million in annual SEG environmental fund revenues. Providing \$7.0 million in annual recycling fund revenues would provide a comparable level of funding for another environmental financial assistance program.

14. Typically, WDF grant and loan programs have statutory provisions and/or administrative rules that describe eligible uses for each grant and loan program. For example technology development loans must be used to provide working capital or fixed asset financing to develop the infrastructure of the business or for the initial commercialization of the new industrial product or process. Commerce must also consider certain factors in awarding grants and loans, such as creation or retention of jobs in the state. In its audit of state economic development programs the Legislative Audit Bureau (LAB) recommended that the Legislature consider reducing the number of programs by consolidating statutory requirements and standardizing eligibility criteria for economic development programs that have similar purposes or provide similar services. The Committee may wish to specify certain factors that the Department should consider in awarding renewable energy grants.

One possibility would be to use the factors included in the bill for restructuring the WDF. Under this alternative the Department would be required to consider any of the following factors in awarding a renewable energy grant or loan: (a) whether the project serves a public purpose; (b) whether the project will retain or increase employment in the state; (c) whether the project might not occur without the grant or loan; (d) whether financing is available from another source on reasonably equivalent terms; (e) the extent to which the project will be financed with funds not provided by the state; (f) whether funds from the grant or loan will be used to pay overhead costs or to replace funds from another source; (g) whether the project will displace any workers in the state; (h) the extent to which the project will retain or increase employment in the state; (i) the extent to which the project will contribute to the economic growth of the state and the well-being of residents of the state; (j) whether the project will be located in an area of high unemployment or low average income; (k) the financial soundness of the eligible recipient; (l) the intention of the eligible recipient to repay the grant or loan; and (m) whether the project will be located in a targeted area.

However, the program is designed to provide financial assistance to projects related to the renewable energy industry. As a result, the factors to consider could be more closely tied to that industry. For example, there are certain renewable energy types in which Wisconsin may have a competitive advantage. A report to the Governor's Ethanol Coalition identifies Wisconsin (along with the rest of the Midwest) as a major biomass producer, with substantial resources of wood, switchgrass, and crop residue. Wisconsin also has manufacturing businesses that can produce wind power turbine components, and energy companies that are developing biomass gasification. In addition, the DATCP Bio-industry grant program would be repealed as part of this proposal. That program required that projects funded through the program have an agricultural purpose.

Based on these considerations, factors that the Committee may wish to require Commerce to consider in awarding grants and loans could include: (a) research and development of technologies, including renewable resources, as energy sources; (b) encouraging the use of products in which Wisconsin may have a competitive advantage; (c) infrastructure development and capacity building which would assist in the development and use of renewable energy sources in Wisconsin; (d) creation of jobs; (e) new capital investment; (f) product market development and expansion; (g) diversification and expansion of production, processing and distribution of renewable energy sources; (h) commercial application of new technologies or practices to the generation of renewable energy; (i) increased use of surplus agricultural products or other excess natural resources in Wisconsin; (j) improvement of the competitive position of this state's industries; (k) efficient use of existing natural resources; (l) geographical distribution of grants and loans; and/or (m) funding demonstration projects that will encourage sustainable renewable energy sources for Wisconsin.

15. The Governor's Ethanol Coalition has indicated that pilot-scale demonstrations of emerging cellulosic technologies are keys to moving production of cellulosic ethanol forward. As is discussed above, a wide variety of technologies are being developed in attempting to commercialize cellulosic ethanol. As a result, the Committee may wish to require that the \$5 million earmarked for cellulosic ethanol be awarded to a wider variety of projects rather than one project.

16. Many of the renewable energy technologies are viewed as being close to becoming marketable, where renewable energy could become a major contributor to energy supplies. Yet, as discussed above, energy R&D spending has declined in the last 20 years. A 1997 study by the President's Committee of Advisors on Science and Technology, and a 2004 report by the National Commission on Energy Policy both recommended that the federal government double its R&D spending on energy. In order to address declining R&D expenditures, the Committee may wish to require that a certain percentage of renewable energy grants be specifically used to fund renewable energy R&D.

17. Under provisions in the bill, the current WDF, GPR and program revenue appropriation could be used for renewable energy awards. Conversely, renewable energy recycling fund revenues could be used for other WDF programs. Since the recycling fund is the source of revenue for renewable energy grants and loans, the Committee may wish to require those funds only be used for renewable energy projects.

18. The bill provides \$50,900 SEG in 2007-08, \$57,800 SEG in 2008-09 and 1.0 SEG position to administer the renewable energy grant and loan program. The Division of Business Development administers most of the Department's economic development grant and loan programs. The Bureau currently manages grant and loan programs with a total of about \$17.0 million in annual funding. About 5.5 positions administer the awards process for these programs. The renewable energy grant and loan program would require the Bureau to administer an additional \$15.0 million. The Department is authorized 1.0 permanent position to administer the Brownfields grant program, with \$7.0 million in annual funding, and 1.0 position to administer the gaming economic development and diversification grant and loan programs, with \$2.5 million in annual

funding. As a result, the additional position for administration could be viewed as appropriate. However, if funding for the program were substantially reduced the Committee could consider deleting this position.

ALTERNATIVES TO BASE

1. Adopt the Governor's recommendation to create, under the Wisconsin Development Fund (WDF), a renewable energy grants and loans program to fund the development of new renewable energy technologies and provide \$15.0 million SEG in each year from recycling fund revenues for grants and loans. A separate administrative appropriation would be established and recycling fund revenues of \$50,900 in 2007-08 and \$57,800 in 2008-09, with 1.0 position would be provided to administer the grant and loan program. Further, specify a grant of up to \$5 million be awarded for a cellulosic ethanol plant.

ALT 1	Change to Bill		Change to Base	
	Funding	Positions	Funding	Positions
SEG	\$0	0.00	\$30,108,700	1.00

2. Modify the Governor's recommendation to provide \$7.0 million in annual SEG recycling fund revenues, instead of \$15.0 million, for renewable energy grants and loans.

ALT 2	Change to Bill		Change to Base	
	Funding	Positions	Funding	Positions
SEG	-\$16,000,000	0.00	\$14,000,000	0.00

3. Modify the Governor's recommendation to provide \$3.0 million in annual SEG recycling fund revenues, instead of \$15.0 million, for renewable energy grants and loans.

ALT 3	Change to Bill	Change to Base
	Funding	Funding
SEG	-\$24,000,000	\$6,000,000

4. Modify the Governor's recommendation to require that Commerce consider the following factors in awarding renewable energy grants and loans:

- a. Factors that would be considered in awarding other WDF grants and loans
- b. Research and development of technologies;

- c. Encouraging the use of products in which Wisconsin has a competitive advantage;
 - d. Infrastructure development and capacity building which would assist in the development and use of renewable energy sources in Wisconsin;
 - e. Creation of jobs;
 - f. New capital investment;
 - g. Product market development and expansion;
 - h. Diversification and expansion of production, processing and distribution of renewable energy sources;
 - i. Commercial application of new technologies or practices to the generation of renewable energy;
 - j. Increased use of surplus agricultural products or other excess natural resources in Wisconsin;
 - k. Improvement of the competitive position of this state's industries;
 - l. Efficient use of existing natural resources;
 - m. Geographical distribution of grants and loans;
 - o. Funding demonstration projects that will encourage sustainable renewable energy sources for Wisconsin;
5. Modify the Governor's recommendation to require that \$5.0 million be used for cellulosic R&D and pilot projects, rather than for a grant for a single cellulosic ethanol plant.
6. Require that one of the following percentages of renewable energy grants and loans be used specifically for research and development:
- a. 10%
 - b. 25%
7. Require that WDF SEG recycling funds only be used for renewable energy grants and loans.
8. Delete \$50,900 SEG in 2007-08 and \$57,800 SEG in 2008-09, and 1.0 SEG position and require Commerce to administer the renewable energy grant and loan program with current staff.

ALT 8	Change to Bill		Change to Base	
	Funding	Positions	Funding	Positions
SEG	-\$108,700	- 1.00	\$0	0.00

9. Delete provision.

ALT 9	Change to Bill		Change to Base	
	Funding	Positions	Funding	Positions
SEG	-\$30,108,700	- 1.00	\$0	0.00

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Attachment

APPENDIX

State BioInitiatives Matrix

Updated April 30, 2007

	\$ for Biofuels, Biopower & Bioproducts	Greenhouse Gas Policy
MINNESOTA		
<p>BIOFUELS Available ✓ Production Incentive - ethanol production incentive of \$0.13 per gallon of ethanol produced. ✓ E85 infrastructure grant - available to service stations installing equipment or converting existing equipment for dispensing E85 fuel to flexible fuel vehicles. Proposed ✓ Lignocellulosic ethanol production grant. ✓ Clean energy equipment loan program.</p>	<p>Participating in Powering the Plains: to investigate a regional cap-and-trade program, but also to consider how farmers in their states can use agricultural practices to sequester carbon dioxide in the soil, and perhaps even market their CO2 storage ability to companies that need CO2 reduction credits. ✓ Minnesota Climate Change Action Plan: A Framework for Climate Change Action.</p>	
<p>BIOWATER Available ✓ Wind and Solar-Electric (PV) Systems Property Tax Exemption – no maximum limit. ✓ Solar & Wind Sales Tax Exemption – 100% exemption. ✓ Agricultural Improvement Loan Program for Wind, Biomass, Anaerobic Digestion RFA provides up to 45% of loan up to \$200,000 of loan principal. ✓ Energy Investment Loan Program - Buys down up to 50% (up to \$500,000) of the loan principal to 0% interest for any specific measure with a simple payback of 10 years or less. ✓ Home Energy Loan Program -\$10,000 per property. ✓ State of Minnesota Solar-Electric (PV) Rebate Program - \$20,000/system. ✓ Minnesota Power - Power Grant Program - Grants are ranked and awarded based on least grant cost per kW (annually) and/or kWh (lifetime). ✓ Minnesota Valley Electric Cooperative - Commercial and Industrial Grant Program- for Geothermal Heat Pumps. ✓ Xcel Energy - Renewable Development Fund Grants for using renewable fuels. ✓ Minnesota Valley Electric Cooperative - Energy Resource Conservation Loan Program Renewable Fuels. ✓ A number of utility rebate programs available. Proposed ✓ Bioenergy producer payment program. ✓ Bioenergy production incentive program. ✓ Bioenergy working lands conservation program. ✓ Renewable energy production incentive. ✓ Renewable energy grants for schools and public buildings. ✓ NextGen Energy Board.</p>	<p>Energy Investment Loan Program - Buys down up to 50% (up to \$500,000) of the loan principal to 0% interest for any specific measure with a simple payback of 10 years or less. Home Energy Loan Program -\$10,000 per property. State of Minnesota Solar-Electric (PV) Rebate Program - \$20,000/system. Minnesota Power - Grants are ranked and awarded based on least grant cost per kW (annually) and/or kWh (lifetime). Minnesota Valley Electric Cooperative - Commercial and Industrial Grant Program- for Geothermal Heat Pumps. Xcel Energy - Renewable Development Fund Grants for using renewable fuels. Minnesota Valley Electric Cooperative - Energy Resource Conservation Loan Program Renewable Fuels. A number of utility rebate programs available.</p>	
<p>BIOPRODUCTS ✓ None Found.</p>		
<p>OTHER Available ✓ The Initiative for Renewable Energy and the Environment (IREE) recently awarded over \$8.5 million to 24 renewable energy projects at the University of Minnesota. Including bioenergy, biofuels and bioproducts. ✓ Seed Grant Program. ✓ Matching Grants. ✓ Special Opportunity Funds. Proposed ✓ Renewable energy economy higher education training needs.</p>		

	<p align="center">\$ for Biofuels, Biopower & Bioproducts</p> <p align="center">IOWA</p>	<p align="center">Greenhouse Gas Policy</p>
<p>BIOFUELS Available</p> <ul style="list-style-type: none"> ✓ Biofuels Infrastructure Grants - An infrastructure program has been created to provide financial assistance to E85 retailers and biodiesel wholesale distributors, \$13 million over three years. ✓ Alternative Fuel Vehicle (AFV) Grants - marketing and education outreach and demonstration grants. ✓ Ethanol Tax Credit - Once station owners surpass the 60% ethanol blended fuel threshold, they are eligible for a tax credit of \$0.025 for every additional gallon of gasoline. ✓ Biodiesel Tax Credit - retailers whose diesel sales are at least 50% biodiesel (B2 and higher blends) are eligible for a \$0.03 per gallon tax credit on each gallon of B2 or higher blend sold. ✓ Alternative Fuel Loan Program - Iowa's Alternate Energy Revolving Loan Program provides zero-percent interest loans for up to half the cost of biomass or alternative fuels related fuel production projects, up to a maximum of \$250,000 per facility. ✓ Iowa Renewable Fuel Fund's Value-Added Agricultural Products and Processes Financial Assistance Program offers a combination of forgivable and traditional low-interest loans for projects involving biomass and alternative fuel technologies. ✓ Iowa Values Fund assists with infrastructure development for E85 retail sites and biodiesel off-site terminal locations, \$325,000 annually for three years. 	<ul style="list-style-type: none"> ✓ Participating in Powering the Plains. ✓ Iowa Greenhouse Gas Action Plan. ✓ University of Iowa joined the Chicago Climate Exchange. 	
<p>BIOWEATER Available</p> <ul style="list-style-type: none"> ✓ Renewable Energy Production Tax Credits for Solar Thermal Electric, Photovoltaics, Landfill Gas, Wind, Biomass, Hydrogen, Anaerobic Digestion at 1.5¢/kWh. ✓ 100% Energy Replacement Generation Tax Exemption for Landfill Gas, Wind, Biomass, Hydroelectric, Anaerobic Digestion. ✓ Local Option Special Assessment of Wind Energy Devices - Property Tax Assessment. ✓ Methane Gas Conversion Property Tax Exemption – 100% for landfill gas and biomass. ✓ Property Tax Exemption for Renewable Energy Systems - Passive Solar Space Heat, Solar Water Heat, Solar Space Heat, Solar Thermal Electric, Photovoltaics, Wind at 100% of project value. ✓ Wind and Solar Energy Equipment Exemption - 100% of sales tax. ✓ Grants for Energy Efficiency and Renewable Energy Research. ✓ Alternate Energy Revolving Loan Program for Solar Water Heat, Solar Space Heat, Solar Thermal Electric, Photovoltaics, Landfill Gas, Wind, Biomass, Hydroelectric 50% of financed project cost for \$250,000 at 0% interest. ✓ Iowa Energy Bank provides financing for public and some non-profit organizations for energy management programs, supported by state oil overcharge funds, aims to implement more than \$500 million in energy improvements. ✓ Utility Rebate programs also available. 		
<p>BIOPRODUCTS Available</p> <p>Grow Iowa Values Fund (\$503 million) --\$100 million from federal funds, \$403 million from tax revenue (BIOWA).</p>		
<p>OTHER Available</p> <ul style="list-style-type: none"> ✓ Iowa Power Fund - \$100 million state fund to expand Iowa's renewable energy industry. 		

Greenhouse Gas Policy	\$ for Biofuels, Biopower & Bioproducts
<ul style="list-style-type: none"> ✓ Emission Credit Trading Registry - generation, use, and trading of Emission Reduction Credits (ERCs) under the Michigan Air Emission Trading Program. 	<p>MICHIGAN</p>
	<p>BIOFUELS</p> <ul style="list-style-type: none"> ✓ Reduced Biofuels Tax - A tax of \$0.12 per gallon is imposed on gasoline containing at least 70% ethanol and diesel fuel containing at least 5% biodiesel (B5). ✓ Alternative Fuel Development Property Tax Exemption - tax exemption may apply to industrial property which is used for, among other purposes, high-technology activities or the creation or synthesis of biodiesel fuel. ✓ Alternative Fuel Vehicle (AFV) Emissions Inspection Exemption ✓ Alternative Fuel Refueling Station Grants to operators of service stations to convert existing, and install new, fuel delivery systems designed to provide E85 and biodiesel blends. ✓ \$1 million for MI Biotechnology Institute. ✓ Biomass Energy Program Grants –funding for projects related to Biomass, Renewable Transportation Fuels. <p>BIOWEIGHT</p> <ul style="list-style-type: none"> ✓ Nonrefundable Business Activity Credit. ✓ Refundable Payroll Credit. ✓ Alternative-Energy Personal Property Tax Exemption, 100% of value. ✓ Energy Efficiency Grants - supports the implementation of energy-efficiency projects and renewable-energy projects in the state. ✓ Large-Scale Photovoltaic Demonstration Project Grants - The grants pay up to 90% of photovoltaic equipment costs up to \$50,000. <p>BIOPRODUCTS</p> <ul style="list-style-type: none"> ✓ Community Energy Project Grants for community demonstration projects or education programs to help consumers better understand energy efficiency and renewable-energy options. <p>OTHER</p> <ul style="list-style-type: none"> ✓ Michigan Biomass Energy Program Workshop and Event Funding.

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<ul style="list-style-type: none"> ✓ First State program to offer greenhouse gas emission credits. ✓ Illinois Conservation and Climate Initiative in partnership with the Chicago climate exchange. ✓ Build a pipeline to move carbon dioxide, a greenhouse gas, captured from coal gasification plants to oilfields in Southeastern Illinois to extract more oil and natural gas and permanently store the carbon dioxide underground. 	<p style="text-align: center;">ILLINOIS</p> <p>BIOFUELS Available</p> <ul style="list-style-type: none"> ✓ E85 Refueling Infrastructure Grant - \$500,000 in funding is available for the Illinois E85 Clean Energy Infrastructure Development Program to establish new E85 facilities at retail gasoline facilities in Illinois. ✓ Clean School Bus Program - provides funding to assist schools/school districts to reduce emissions from diesel-powered school buses through emission control retrofits, implementation of cleaner fuels, including biodiesel, propane and natural gas, and support for emissions reduction policies including those related to idle reduction. ✓ Alternative Fuel Vehicle (AFV) and Alternative Fuel Rebates - provides a rebate for 80% of the incremental cost of purchasing an AFV (up to \$4,000), 80% of the cost federally certified alternative fuel vehicle conversions (up to \$4,000), and for the incremental cost of purchasing alternative fuels. ✓ Biofuels Research and Development-provides grants of up to \$25,000 for the development of business plans, engineering studies, design studies, permit applications, and legal work for potential new biofuels facilities in Illinois. ✓ Ethanol Tax Exemption - Sales and use taxes do not apply to ethanol-blended fuels. ✓ Biodiesel Tax Exemption - These taxes do not apply to the proceeds from the sale of biodiesel blends containing more than 10% biodiesel. <p>Proposed</p> <ul style="list-style-type: none"> ✓ \$25 million available for state programs, production & research. ✓ Invest \$100 million over the next 5 years to build up to 20 new ethanol plants. ✓ Invest \$25 million to help build five new biodiesel plants. ✓ Invest an additional \$100 million over the next ten years to build four plants in downstate Illinois using new technology to create cellulosic ethanol made from plant waste materials like corn husks and wood pulp. ✓ \$30 million over the next 5 years to add 900 more E-85 pumps statewide by 2010, meaning 20 percent of Illinois gas stations would offer E-85. ✓ Provide up to \$25 million incentives to produce more vehicles that can run on E-85. ✓ No sales tax on E85 Renewable Fuels Development Program. <p>BIOPOWER Available</p> <ul style="list-style-type: none"> ✓ Illinois Clean Energy Community Foundation Grants - \$225 million endowment for projects that improve energy efficiency, develop renewable-energy resources, and preserve and enhance natural areas and wildlife habitats in Illinois. ✓ Special Assessment for Renewable Energy Systems - property tax exemption ✓ Solar-Thermal Grant Program - 30% of project cost up to \$400,000. ✓ Wind Energy Production Development Program - up to \$25,000 with a minimum of 0.5 MW capacity. ✓ Renewable Energy Resources Program (RERP) Rebates - 30% up to \$10,000. <p>Proposed</p> <ul style="list-style-type: none"> ✓ Invest \$775 million to help build up to ten new coal gasification plants that use Illinois coal to meet 25 percent of Illinois' diesel fuel needs, 25 percent of natural gas needs and 10 percent of electricity needs by 2017. ✓ Meet 10% of the state's electricity needs from renewable energy sources by 2015, greatly boost investment in energy efficiency, while finding ways to cut emissions and reduce motor fuel consumption by 10% in 2017. ✓ \$25 million revolving loan fund to support energy efficiency investments in public buildings to reduce government energy usage. ✓ \$25 million revolving loan fund to support energy efficiency investments by small businesses and manufacturers. <p>BIOPRODUCTS</p> <ul style="list-style-type: none"> ✓ Province of Ontario and the State of Illinois signed a five-year agreement to collaborate on biotechnology research and trade.

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<ul style="list-style-type: none"> ✓ Participating in Powering the Plains. ✓ Mandatory reporting requirements for large generators of CO₂ and has a registry that allows firms to report reductions of CO₂, with the intent of allowing them to obtain credit for reduction in any future federal or state GHG program. ✓ Created Task Force on Global Warming. 	<p style="text-align: center;">WISCONSIN</p> <p>BIOFUELS</p> <p>Available</p> <ul style="list-style-type: none"> ✓ State alternative fuel vehicle (AFV) tax deduction identical to the federal AFV tax deduction. The deduction is reduced by 25% for vehicles placed in service in 2004, by 50% for vehicles in 2005 and by 75% for vehicles in 2006. ✓ Biodiesel Fuel Use Incentive - provide school transportation aids to school districts that use biodiesel fuel for school bus transportation, to cover the incremental cost of using biodiesel as compared to the cost of petroleum diesel fuel. ✓ Alternative Fuel Tax Exemption - No county, city, village, town, or other political subdivision shall levy or collect any excise, license, privilege, or occupational tax upon motor vehicle fuel or alternative fuels or upon the buying, selling, handling, or consuming of motor vehicle fuel or alternative fuels. <p>Proposed</p> <ul style="list-style-type: none"> ✓ \$1 million in tax credits for gas stations and private fleet operators who install E85 and biodiesel tanks and pumps. ✓ Tax Exemption for Flexible Fuel and Hybrid Vehicles. ✓ \$5 million from the Energy Independence Grant and Loan Program for grants to develop the nation's first cellulosic ethanol plant. <p>BIOWATER</p> <p>Available</p> <ul style="list-style-type: none"> ✓ We Energies – Solar Biogas Buy-Back Rate - production incentive of \$0.08 per kilowatt-hour (8.0¢/kWh) for on-peak generation \$0.049 per kilowatt-hour (4.9¢/kWh) for off-peak generation. ✓ We Energies - Solar Buy-Back Rate – production incentive of \$0.225 per kilowatt-hour (22.5¢/kWh). ✓ Solar and Wind Energy Equipment Exemption - 100% exemption. ✓ Focus on Energy - Renewable Energy Grant Programs - \$85,000 to any individual or business during each fiscal year. ✓ Focus on Energy - Renewable Energy Cash-Back Rewards - 25% (up to \$35,000) for most PV systems; 25% (up to \$2,500 for single-family and \$25,000 for multi-family) for domestic solar hot-water systems; 25% (up to \$35,000) for wind and commercial solar hot-water systems. ✓ We Energies - Renewable Energy Development Program - \$10,000 to \$100,000 per project. ✓ Wisconsin Public Power, Inc. - Residential Renewable Energy Loan - Participants may borrow \$2,500 to \$20,000; 1.99% APR; 10 year maximum term. ✓ Other utility rebate programs available. <p>Proposed</p> <ul style="list-style-type: none"> ✓ Biobased Industry Opportunity (BIO) Grant Program for Biomass, Renewable Transportation Fuels, Anaerobic Digestion. ✓ State Loan Programs. ✓ State Rebate Program. ✓ Tax exemption for biomass heating units used for residential use. <p>BIOPRODUCTS</p> <ul style="list-style-type: none"> ✓ None Found <p>Other</p> <ul style="list-style-type: none"> ✓ Provide \$30 million over the biennium for the Energy Independence Grant and Loan Program to increase the use of renewable energy and fuel technology. ✓ \$5 million annually to support high-technology and biotechnology startup companies. ✓ \$2 million over the biennium to contract with nonprofit organizations that assist businesses to reduce and recycle solid waste through direct business recycling projects, best practices exchanges, and research and development to address environmental or market issues with specific technologies.

EO=Executive Order
Source: Wisconsin Office of Energy Independence