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Committee on Communications, Energy, and Public Utilities

REVIEW POTENTIAL METHODS OF ENCOURAGING RENEWABLE ENERGY THAT MINIMIZE THE ECONOMIC IMPACT ON UTILITY RATEPAYERS

Statement of the Issue

Although the Legislature has taken steps in recent years to encourage expansion of the use of renewable energy, there has been little increase. The primary reason is that renewable energy currently costs more than energy produced by traditional methods, and the Legislature has been reluctant to require that utility ratepayers pay this higher cost. As a result, there has been little economic incentive for increased use of renewable energy and most of the new renewable energy has come from regulated utilities pursuant to a statute that allowed them to recover their full costs for a limited amount of renewable energy projects.

The purpose of this project is to identify methods of encouraging renewable energy that do not have a detrimental impact on utility ratepayers and to identify and discuss the potential benefits and detriments of such methods, including potential limitations on any detriments.

Discussion

Background

A. Economic Regulation

The majority of incentives to encourage increased use of renewable energy focus on producers of renewable energy other than the traditional utility. In order to understand all of the potential impacts of these incentives it is first necessary to understand the principles of economic regulation that govern traditional utilities.

1. Factors Necessitating Economic Regulation

Most industries in the U.S. are not economically regulated. Instead, market forces of supply and demand set prices. Economic regulation is used when these forces do not function effectively and efficiently. A brief description of the historical electricity industry business model helps to understand the bases for applying economic regulation to the industry. Under this model, which is utilized in Florida, the electricity industry consists of vertically-integrated utilities, in which one entity owns and operates all the facilities for the entire process of producing, selling, and delivering the electricity to the end-use customer, functioning as a regulated monopoly provider within a prescribed service territory. This illustrates the two reasons for economic regulation of the electric industry.

First, the electricity market was deemed a "natural monopoly" that necessitated economic regulation to keep prices competitive and to avoid waste.[1] In a natural monopoly, due to economies of scale, one company can produce a product at a lower cost to society than multiple companies can. Additionally, there are high capital costs and a situation in which redundant or duplicative systems, such as power plants and transmission lines, are wasteful or undesirable. The economic concept of a natural monopoly has been described as follows.

> The term does not refer to the actual number of sellers in a market but to the relationship between demand

[1]Joseph P. Tomain and Richard D. Cudahy, *Energy Law* (Thomson West, 2004), 268.

> and the technology of supply. If the entire demand within a relevant market can be satisfied at lowest cost by one firm rather than by two or more, the market is a natural monopoly, whatever the actual number of firms in it. If such a market contains more than one firm, either the firms will quickly shake down to one through mergers or failures, or production will continue to consume more resources than necessary. In the first case competition is short-lived and in the second it produces inefficient results. Competition is thus not a viable regulatory mechanism under conditions of natural monopoly. Hence, it is said, direct controls are necessary to ensure satisfactory performance: controls over profits, specific rates, quality of service, extensions and abandonments of service and plant, even permission whether to enter the business at all.[2]

The second reason for economic regulation is that electricity was deemed to be a highly desirable or necessary consumer product and to be a product in the public interest.[3]

2. Brief Discussion of Economic Regulation and Its Goals

In general, the federal government, through Congress and the Federal Energy Regulatory Commission (FERC), regulates wholesale and interstate electricity sales and interstate transmission while the states regulate intrastate retail sales and intrastate transmission and distribution.[4] The purpose of economic regulation is to substitute for competitive market forces of supply and demand through ratemaking and minimum service quality requirements. Thus economic regulation addresses both price and reliability.

As to price, the Florida Statutes provide for "just, reasonable, and compensatory rates."[5] This requirement addresses a number of underlying goals. The most obvious is to have prices set at a low level based on costs which are prudently incurred.[6] A second is to ensure that rates are adequate to provide the utility recovery of all prudently incurred costs plus a fair rate of return for its investors.[7] A third goal is to ensure that the utility, a private company, can obtain capital at competitive costs.[8] The utility must be fiscally healthy enough, including a sufficient rate of return and profit, to attract investors and lenders on good terms. Otherwise, either the utility incurs higher costs than it should, which are passed on to the ratepayers, or the utility may not be able to provide adequate and reliable service to its ratepayers. Thus the regulator must balance protections from monopolistic price gouging against the need to provide an adequate revenue stream to the utility.[9] Ratepayers' bills include two types of charges: base rates, which recover capital and other fixed costs, and recovery clause charges, which recover variable or extraordinary costs such as fuel costs or environmental regulation costs. Economic regulation has the effect of evening out recovery of costs and, more significantly, of the allowed rate of return. If the rate of return, or prices and profits, were allowed to fluctuate as in a competitive market, they would be:

- higher in times of high demand for electricity, such as in the late 1990s, with a commensurate price increase impact on ratepayers, and
- lower in economic hard times, such as the last few years, with an impact on the utility, which, if left unchecked for too long, could affect its ability to provide adequate and reliable service.

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[2] Richard A. Posner, *Natural Monopoly and its Regulation* (CATO Institute, Washington, D.C., 1999), 1. See also, Richard J. Pierce, Jr. and Ernest Gellhorn, *Regulated Industries* (West Group, St. Paul, Minnesota, 1999), 48-54, and Tomain and Cudahy, *Energy Law*, 120-122.

[3] Tomain and Cudahy, *Energy Law*, 268.

[4] Tomain and Cudahy, *Energy Law*, 267.

[5] s. 366.041(1), F.S.

[6] Pierce, Jr. and Gellhorn, *Regulated Industries*, 11.

[7] Tomain and Cudahy, *Energy Law*, 126.

[8] Tomain and Cudahy, *Energy Law*, 123-125. According to the authors, the economic circumstances surrounding the "capital-attraction function" of ratemaking have changed significantly over the years. During the period when the industry was expanding and growing and technology was making significant advancements, up until roughly 1970, utilities were seen as a steady growth industry. Returns to stockholders and bondholders were somewhat less than those of competitive companies due to a perceived lower risk. Since the 1970s, utilities have faced higher inflation, higher business costs, and a political climate stressing resource and energy conservation, which contributed to higher prices and higher consumer expectations. Public utilities began to compete aggressively for investment capital, and began to demand a higher rate of return. The situation has been complicated further by deregulation efforts of the federal government and some state governments, resulting in increased competition for capital.

[9] Tomain and Cudahy, *Energy Law*, 122.

The former is more likely than the latter as, statistically speaking, booms last longer than busts.
As to reliability, the statutes require each public utility to furnish to each person applying therefore reasonably sufficient, adequate, and efficient service, upon terms as required by the commission, and without any undue or unreasonable preference or advantage to any person or locality, or any undue or unreasonable prejudice or disadvantage in any respect.[10] This is known as the utility's "obligation to serve." This again addresses multiple goals, including providing service to all who request and pay for it; having generation facilities that are sufficient in quantity and quality to produce enough electricity to meet all levels of demand, which requires a reserve margin, an excess of generation facilities to meet peak demand; and having transmission and distribution facilities that similarly are sufficient in quantity and quality to deliver all demanded electricity in a reliable and consistent fashion.

Underlying economic regulation is the "regulatory compact," a method of balancing rights and obligations of a utility and its ratepayers. The regulatory compact has been described as follows.

> The utility business represents a compact of sorts; a monopoly on service in a particular geographic area (coupled with state-conferred rights of eminent domain or condemnation) is granted the utility in exchange for a regime of intensive regulation, including price regulation, quite alien to free market. . . . Each party to the compact gets something in the bargain. As a general rule, utility investors are provided a level of stability in earnings and value less likely to be attained in the unregulated or moderately regulated sector; in turn, ratepayers are afforded universal, non-discriminatory service and protection from monopoly profits through political control over an economic enterprise.[11]

In other words, under the regulatory compact, a utility is granted: 1) a protected monopoly within a defined service territory, 2) recovery of all prudent and reasonable costs, 3) the ability to earn a profit within a regulator-determined range of levels of return on investment, and 4) the power of eminent domain. In return, the utility's ratepayers get: 1) the utility's obligation to serve, the obligation to provide electric service to all paying customers within that service territory, 2) imposition and enforcement of quality of service and reliability standards, and 3) fair and reasonable rates.

3. Issues in Incorporating Non-utility Producers of Renewable Energy into the Economic Regulation Model

In contrast to regulated public utilities, producers of renewable energy are not subject to economic regulation and have no obligation to serve. Instead, they are prohibited from making retail sales,[12] and public utilities cannot be required to purchase their power at more than the purchasing utility's full avoided costs.[13]

As was stated above, electricity has long been deemed a highly desirable or necessary consumer product and to be in the public interest. For our physical and economic wellbeing, we must maintain a sufficient, reliable supply of electricity at a fair and reasonable price. This is a fairly straightforward process with vertically-integrated utilities

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[10] s. 366.03, F.S.
[11] Tomain and Cudahy, *Energy Law*, 121-122, quoting from *Jersey Cent. Power and Light Co. v. F.E.R.C.* (D.C. Cir. 1987).
[12] Chapter 366, F.S., requires that each "electric utility" comply with its requirements, and defines that term to include every person or entity supplying electricity to the public. s. 366.02, F.S. The Florida Supreme Court has interpreted this to mean that a non-utility can produce electricity for its own use, but cannot sell any excess at retail to any other person or entity. *PW Ventures, Inc. v. Nichols*, 533 So. 2d 281 (Fla. 1988). Additionally, to build a power plant with a capacity of 75 megawatts or more requires a determination of need. s. 403.506, F.S. To petition for a determination of need, the proposed power plant owner must be a regulated electric company, a municipal electric utility, or a cooperative electric utility serving retail customers. s. 403.519, F.S., *Tampa Electric Co. v. Garcia*, 767 So. 2d 428 (Fla. 2000), and *Panda Energy International v. Jacobs*, 813 So.2d 46 (Fla. 2002).
[13] Section 366.051, F.S., was enacted based on requirements of the Federal Public Utility Regulatory Policies Act of 1978. It requires that investor-owned utilities purchase electricity from cogenerators and small power producers. A cogenerator is a facility sequentially producing both thermal energy and electrical or mechanical power from the same fuel source. For example, a manufacturing plant that produces heat as a part of the manufacturing process then uses that heat to produce steam to make electricity. Small power producers generate electricity using biomass, solid waste, geothermal energy, or renewable resources (wind, solar, small hydroelectric) as their primary energy sources. Definitions taken from the PSC's *Florida's Electric Utilities: A Reference Guide*, 1994 edition, 30 and 188.

subject to economic regulation. If non-utility renewable energy producers began to produce significant percentages of the electricity supply, this process would become more difficult. One of the most significant issues is how to ensure the continuation of an adequate supply without excessive cost. The regulated utilities have an obligation to serve, which includes a requirement that they continually provide an adequate and reliable supply of electricity to meet the demand of all customers. Renewable energy suppliers have no such obligation. This raises potential problems in three areas.

The first is adequate generation capacity. Currently, renewable energy sold to the grid comprises approximately two percent of total electricity sold at retail. An aggressive renewable energy incentive, such as the 20 percent frequently sought in renewable portfolio standard proposals, would result in a tremendous increase in the proportion of electricity produced by non-utility sources. Currently, if a renewable energy producer ceases to produce the planned electricity, the utility can absorb this loss using its reserve margin.[14] However, when 20 percent of the electricity that a utility sells comes from a resource outside its control, reliability issues arise.

The issue of adequate generation capacity is further complicated by the fact that renewable energy cannot supply consistent base load generation and many of the current regulated utility plants will continue to be necessary to supply this need and to provide the reserve for when the renewable energy plants are not producing sufficient electricity.[15] The sun doesn't always shine; the wind doesn't always blow; biomass and municipal solid waste plants must be shut down periodically for maintenance and repair and can experience fuel supply problems; and waste-heat production only functions when the manufacturing process is up and running. The public utilities must maintain sufficient generation capacity to meet the total need during these times, and they must be able to bring them on line quickly to immediately replace production lost when a renewable energy producer falls out of production.

To address these issues, policy makers will need to choose among the following options:

- require the renewable energy producers to assume an obligation to serve, like that of the regulated utilities;
- require that the regulated utilities continue to provide all electricity generation facilities necessary for reliability purposes, thereby requiring that they duplicate the amount of generation capacity of the renewable energy providers just in case one of these providers fails to provide the necessary electricity, resulting in redundant, or duplicative, generation capacity, with the accompanying costs to be recovered from ratepayers; or
- relieve or partially relieve the utility of its reliability requirements, leaving customers subject to potential shortages of electricity and power outages.

A further complication in deciding these issues is the potential for new policy that would allow a producer of renewable energy to sell electricity to a customer or group of customers directly at retail. Any such new policy would have to address the issue of what should be done if one of these renewable energy producers ceased operations.[16]

The second area of potential problems relates to the grid. Renewable energy producers' facilities and the timing and amount of their output are not under the control of the utilities or the Florida Reliability Coordinating Council (FRCC), which continuously monitors the electric grid and ensures that the electricity supplied to the grid and that taken from it balance. Without this balance the grid could crash, resulting in cascading blackouts.

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[14] Reserve margin is the difference between the dependable capacity of a utility's system and the anticipated peak load for a specified period. PSC's *Florida's Electric Utilities: A Reference Guide*, 1994 edition, 178. It is additional generation capacity above that projected to be necessary to meet all load at peak that is in reserve in case of an emergency, such as an unplanned plant outage.

[15] Base load is defined as the minimum load demanded over time on a utility's generation system. PSC's *Florida's Electric Utilities: A Reference Guide*, 1994 edition, 10. In this context, however, the term relates more to meeting the constant, base needs of the total body of electricity customers.

[16] Similar issues arose in the context of new entrants into the telecommunications market. *See* Senate Committee on Communications and Public Utilities, *Review of Access by Communications Companies to Customers in Multitenant Environments*, Interim Project Report 2006-106, September 2005.

Other grid-related issues must also be addressed. If a new renewable facility is in a location that has inadequate utility-owned power lines to carry this new electricity onto the grid, who should be required to site, construct, and maintain these new lines, and who is to pay for these activities? Similar issues could arise if an existing renewable energy producer significantly increased its production, resulting in a need to increase the number or size of existing transmission or distribution lines. Another issue relates to a producer of renewable energy that uses some of that energy at separate locations and wants lines between these locations. Who should be required to site, construct, and maintain these new lines and who is to pay for these activities? Finally, eminent domain issues could arise in all of these circumstances.

Third, the current wholesale transactions do not impact ratepayers' costs because the statutes expressly provide for sales at the regulated utility's full avoided cost, which is the cost the utility would have incurred to produce that amount of electricity if not for the purchase. However, even with rising prices for traditional fuels, renewable energy currently costs more than energy produced using traditional fuels. If use of renewable energy is increased, market forces and further technological improvements may decrease prices. For now, however, to be successful, a renewable energy incentive will have to require that a higher purchase price be paid to the renewable energy producers. Under future policy changes, this increased cost will be paid by one or a combination of the following two alternatives.[17] First, the amount of the cost increase could be passed on to ratepayers, as under the current system. Second, it could be absorbed by the utility, with a risk of detriment to its financial standing, resulting in higher costs of raising capital which will also be paid by ratepayers.

As was discussed above, a decision must be made as to whether to require regulated utilities to maintain redundant, duplicative generating facilities. If they are required, this obviously is an additional cost component. There may be an additional cost component even if they are not required however. If it is decided that some existing utility plants should be retired, the utility is entitled to recover its embedded costs of constructing that capacity.

Prior to the recession, Florida had a reserve margin of about 20 percent. The recession has resulted in a decrease in demand now and for the foreseeable future, which means an even higher reserve margin. In addition, two regulated utilities are planning large nuclear power plants, which will result in redundant capacity, and which must be incorporated into capacity planning.[18] Given the existing need to address future retirement of plants due to replacement capacity, and the unusually large reserve margin, this may be an opportune time to address additional potential retirements due to new renewable energy capacity.

Another key cost-related consideration is the timing of anticipated costs and benefits. Given limited funding, should those funds be focused on present or future costs and benefits? Some resources, for example biomass, produce more energy more quickly and less expensively than others, such as solar photovoltaic, yet the latter may have greater future potential.[19] Resolution of these issues will have a significant impact on the amount and timing of cost recovery.

B. Incentives

Incentives

[17] This would have to be done in compliance with the federal prohibition against requiring a public utility to pay more than its full avoided costs for electricity, discussed in more detail below.

[18] Progress Energy Florida plans to construct two 1,000 megawatt nuclear units proposed and to retire older coal facilities upon placing the new nuclear units into production.

[19] This is neither a new issue nor one limited to renewable energy resources. With conventional fuels and technologies, similar choices must be made as between a power plant that is less expensive up-front but may have higher costs later, like a natural gas combined cycle plant, and one that is more expensive up-front, but may have lower costs later, like a nuclear plant. Permitting and constructing of the natural gas plant costs significantly less and is much quicker so the near-term benefits are greater. In contrast, permitting and constructing the nuclear plant is costly and time-consuming, but the fuel is much less expensive and, historically, much less subject to price fluctuations

The Legislature has already codified quite a number of incentives to encourage increased use of renewable energy. These include:

- requirements that public utilities purchase renewable energy from specified producers;
- incentives for public utilities to produce renewable energy;
- government facilitation, including government-funded rebates, tax breaks, or loans; and
- requirements for demand-side renewable energy in public utility conservation requirements.

Other potential incentives, some of which the Legislature has considered in the past, include:

- a renewable portfolio standard (RPS);
- a feed-in tariff;
- creation of a renewable energy credit (REC) without an RPS requirement;
- voluntary green energy programs;
- limited retail sales by renewable energy producers;
- public utility sales outside the regulatory structure;
- municipal special assessments or similar cost-recovery provisions to pay for renewable energy; and
- a public benefits fund.

Discussion of Incentives

For discussion purposes, it is beneficial to group these 12 types of incentives based on function, dividing them into four groups: government facilitation, required public utility purchase or production, voluntary purchase, and funding sources.

A. Government Facilitation

These types of incentives fall into two subcategories, government funding for rebates, tax breaks, or loans, and organization of governmental entities to administer these programs and otherwise assist in bringing renewable energy businesses to Florida.

Two types of rebates have been codified: the solar energy system incentives program created in section 377.806, F.S.,[20] and the energy-efficient appliance rebate program created in section 377.807, F.S. The solar energy rebate program expired June 30, 2010. It was very popular, was oversubscribed, and had a large amount of unfunded claims. The energy-efficient appliance rebate program is still in effect. It has not been funded by state funds, but federal stimulus money was used for a one-time rebate.

There are three statutes creating tax breaks aimed at increasing use of renewable energy: an exemption from the sales tax for the purchase of specified types of renewable-energy-related materials created in section 212.08, F.S.;[21] an investment tax credit against the corporate income tax for costs relating to renewable energy projects,

[20]The rebate was available for a new photovoltaic system of 2 kilowatts or larger, with the amount of the rebate to be $4 per watt based on the total wattage rating of the system, with a maximum allowable rebate per solar photovoltaic system installation of twenty thousand dollars for a residence or one hundred thousand dollars for a place of business, a publicly owned or operated facility, or a facility owned or operated by a private, not-for-profit organization, including condominiums or apartment buildings. The rebate was available for a solar thermal system that provides at least 50 percent of a building's hot water consumption for a solar thermal system or for a solar thermal pool heater, with the amount of the rebate to be five hundred dollars for a residence, fifteen dollars per 1,000 Btu up to a maximum of $5,000 for a place of business, a publicly owned or operated facility, or a facility owned or operated by a private, not-for-profit organization, including condominiums or apartment buildings, and $100 per installation for solar thermal pool heaters.

[21] The exemption from the sales tax was for materials incorporated into hydrogen-powered vehicles and for hydrogen-fueling stations, up to $2 million in tax each fiscal year; for commercial stationary hydrogen fuel cells, up to $1 million in tax each fiscal year; and for materials used in the distribution of biodiesel and ethanol, including fueling infrastructure, transportation, and storage, and including the costs of retrofitting a gasoline fueling station pump for ethanol distribution, up to $1 million in tax each fiscal year.

created in section 220.192, F.S.;[22] and a renewable energy production credit against the corporate income tax created in section 220.193, F.S.[23] The first two provisions were little used and were automatically repealed July 1, 2010. The third has no express automatic repeal date, but as it provides that "credits for the production and sale of electricity from a new or expanded Florida renewable energy facility may be earned between January 1, 2007, and June 30, 2010" it is effectively limited to 2010.[24] This credit was used, and could be revived.

Two statutory incentive programs that were recently created involve loans for renewable energy purposes. The first authorizes local governments to levy non-ad valorem assessments to fund energy efficiency and renewable energy improvements for property owners who voluntarily participate in a local government financing program. It also grants local governments the authority to issue debt, payable from revenues received from the improved property, and to partner with one or more local governments for the purpose of providing such improvements.[25]

The second program is a loan guaranty program under chapter 288, F.S. It authorizes the existing Florida Development Finance Corporation to participate in a federal program providing loan guarantees for capital projects relating to renewable energy. Leveraging left-over funds from existing grant programs, the state guarantees 5 percent of the loan amount, the federal government guarantees 75 percent, and the business provides the other 20 percent.[26]

All of these government-funded incentives either were allowed to expire or were created in the 2010 Regular Session. Additionally, they cost taxpayers money. For these reasons, it is doubtful anything will change with these incentives in the near future.

The second subcategory of government facilitation incentives is organization of governmental entities to administer these government-funded incentive programs and to otherwise assist in bringing renewable energy businesses to Florida

The first such effort was the creation of the Florida Solar Energy Center in 1976 via enactment of section 377.705, F.S. The purpose of the center is "to encourage the development of an alternative energy capability in the form of incident solar energy" by "provid[ing] incentives for the production and sale of, and to set standards for, solar energy systems." The center also trains solar installers. The center has no ratepayer impact. It does have some taxpayer impact, but its fees are, in general, supposed to cover its testing and training operations. Options are either expanding use of the center or allowing any state university to perform the same testing and training.

A second state entity is the Florida Energy and Climate Commission (FECC), created in section 377.6015, F.S., enacted in 2008. The FECC is charged with many duties, including:

- administering the Florida Renewable Energy and Energy-Efficient Technologies Grants Program, now expired;[27]
- developing policy for requiring grantees to provide royalty-sharing or licensing agreements with state government for commercialized products developed under a state grant;
- administering the Florida Green Government Grants Act;

[22] The investment tax credit against the corporate income tax was for up to 75 percent of capital costs, operation and maintenance costs, and research and development costs incurred: up to a limit of $3 million per state fiscal year for all taxpayers in connection with an investment in hydrogen-powered vehicles and hydrogen vehicle fueling stations in the state; up to a limit of $1.5 million per state fiscal year for all taxpayers, and limited to a maximum of $12,000 per fuel cell, in connection with an investment in commercial stationary hydrogen fuel cells in the state; and up to a limit of $6.5 million per state fiscal year for all taxpayers, in connection with an investment in the production, storage, and distribution of biodiesel (B10-B100) and ethanol (E10-E100) in the state.

[23] The renewable energy production credit against the corporate income tax was $0.01 for each kilowatt-hour of electricity produced and sold by the taxpayer to an unrelated party during a given tax year.

[24] s. 220.193(3)(g), F.S.

[25] section 1, chapter 2010-139, Laws of Florida.

[26] sections 2-15, chapter 2010-139, Laws of Florida.

[27] s. 377.804, F.S. The grants are available for renewable energy on both renewable electric energy and renewable motor vehicle fuels.

- administering the information gathering and reporting functions pursuant to ss. 377.601-377.608;
- advocating for energy and climate change issues and provide educational outreach; and
- technical assistance in cooperation with the state's academic institutions.

The FECC is staffed by the Florida Energy Office (EO) which actually performs most of the FECC duties, under FECC oversight. The majority of the EO staff was occupied with the administration of the recently-expired grant programs. They are now administering grant programs created using federal stimulus money, the Opportunity Fund, and the new loan guarantee program. The Energy Office and the FECC were instrumental in obtaining this stimulus money.

A third government agency indirectly involved in encouraging renewable energy is the Florida Energy Systems Consortium created to promote collaboration among experts in the State University System for the purposes of sharing energy-related expertise and assisting in the development and implementation of a comprehensive, long-term, environmentally compatible, sustainable, and efficient energy strategic plan for the state.[28]

These state agencies have no ratepayer impact, but do rely on tax revenues for funding. They are important and have accomplished significant incentives for renewable energy, particularly with the EO's efforts in obtaining federal stimulus money. While these entities are an improvement over past use of state agencies to encourage renewable energy, they could still be further improved, again particularly the EO, which is hampered by a lack of leadership in its oversight entity, by a lack of staffing, and by poorly focused statutory duties. A reorganization of the EO and the FECC is, however, beyond the scope of this report.

B. Purchase or Production by Regulated Utility[29]

1. Mandatory Purchase and the Full Avoided Cost Standard

Florida Statutes currently contain two requirements that utilities purchase renewable energy from non-utility producers. Section 366.051, F.S. requires that each electric utility[30] purchase electricity from any cogenerator[31] or small power producer[32] that is located in the utility's service area (unless the cogenerator or small power producer chooses to sell the electricity to another electric utility in the state), with the purchase price for a public utility[33] set at the purchasing utility's full avoided costs, which are defined as "the incremental costs to the utility of the electric energy or capacity, or both, which, but for the purchase, the utility would generate itself or purchase from another source."[34] Section 366.91, F.S. requires that each public utility and specified municipal utilities continuously offer a purchase contract to producers of renewable energy, with the purchase price again set at the purchasing utility's full avoided costs.[35] Because of the avoided costs standard, neither of these statutes has an

[28] The Consortium was created in section 1004.648, F.S., codified in 2008.
[29] These incentives are classified as mandatory because they require, by law, a purchase by some entity or group. As such, some people see them less as an incentive and more as a legally mandated, artificial marketplace. This class of incentives includes: the existing statutes requiring purchase at full avoided cost; incentives using demand-side renewable energy in conservation; a renewable portfolio standard; a feed-in tariff; and expanded incentives for production by a public utility. The first four require purchase by a regulated public utility, with recovery from the utility's ratepayers; the last requires purchase by a public utility's ratepayers.
[30] The term "electric utility" includes any municipal electric utility, investor-owned electric utility, or rural electric cooperative which owns, maintains, or operates an electric generation, transmission, or distribution system within the state. s. 366.02(2), F.S.
[31] A cogenerator is a facility sequentially producing both thermal energy and electrical or mechanical power from the same fuel source. For example, a manufacturing plant that produces heat as a part of the manufacturing process then uses that heat to produce steam to make electricity. PSC's *Florida's Electric Utilities: A Reference Guide*, 1994 edition, 30.
[32] A small power producer generates electricity using biomass, solid waste, geothermal energy, or renewable resources (wind, solar, small hydroelectric) as their primary energy sources. PSC's *Florida's Electric Utilities: A Reference Guide*, 1994 edition, 188.
[33] The definition of the term "public utility" specifically excludes cooperative and municipal electric utilities, leaving only the investor-owned utilities. s. 366.02(1), F.S.
[34] s. 366.051, F.S.
[35] s. 366.91, F.S.

economic impact on the purchasing utility's ratepayers because the utility incurs no more costs than it otherwise would have.

Almost all of the existing renewable generation in Florida was constructed as a result of the federal Public Utilities Regulatory Policy Act (PURPA) and section 366.051, F.S.[36] However, utilities' costs of generation have fallen since these laws were enacted due to lower costs of construction and operation of combined cycle technology, and the payment to qualified facilities is now lower than when they first became law.[37] As such, it is unlikely that very many new renewable facilities will be constructed based on current avoided cost payment levels.[38]

There have been legislative proposals to modify the avoided cost standard, most recently in the 2010 Regular Session.[39] The 2010 bills would have set a statutory amount of avoided costs. They stated a legislative finding "that 80 percent of the weighted average of firm service retail electric rates of each public utility, including all adjustment, recovery, and similar such add-on charges, directly correlates with each utility's full avoided cost for acquiring energy from renewable energy producers that meet [specified] operating requirements . . . , and is an administratively efficient, transparent, prudent, and preferred methodology for calculating full avoided cost. The full avoided cost to which all renewable energy producers are entitled is and shall be the mathematical product of 0.80 and the weighted average of firm service retail electric rates in cents per kilowatt hour, including all adjustment, recovery, and similar such add-on charges, of the purchasing utility." The bills stated two alternative operating requirements to qualify for avoided cost payments at this level, either:

- generate and deliver to the grid a fixed amount of electrical capacity at a rate of production, such that the amount of energy produced per 1 megawatt of fixed capacity is 7,000 megawatt hours or more per year; or
- generates electric energy using waste heat from sulfuric acid manufacturing operations, such that the amount of electric energy produced at the site per 1 megawatt of system generating capacity is 5,500 megawatt hours or more per year and that exports less than 50 percent of the total electric energy produced to the grid.

This legislation was supported by a report that was presented to the House Energy & Utilities Policy Committee on March 11, 2010.[40]

PSC staff had the following concerns about using retail as a standard for statutorily setting avoided cost payment amounts.

- Retail rates are designed to recover the utility's total costs of providing complete service to its customers, including costs for: generation, transmission, distribution, fuel, operating and maintenance, utility-sponsored conservation programs, environmental compliance, and specified advanced recovery for new nuclear power plants. Renewable energy resources contribute only to the generation component, and generally offset only fuel costs.

[36] Florida Public Service Commission and the Department of Environmental Protection, *An Assessment of Renewable Electric Generating Technologies for Florida*, January 2003, 1-3.

[37] Until about 1970, electric utilities were seen as a steady growth industry. However, beginning in approximately 1965, electric utilities' marginal costs, the costs of producing the next unit of a good, began to exceed their average costs, reducing profits. During this time period, some utilities were investing billions in nuclear power plants, only to cancel those plants, resulting in enormous cost overruns. Additionally, along with everyone else, they faced high inflation, rising labor costs, and the oil OPPEC embargo. Energy Law, Joseph P. Tomain and Richard D. Cudahy, Thomson West, 2004, pages 123-125 and 270-271. As a result, when PURPA was enacted in 1978, electric utilities' costs, the costs upon which PURPA's avoided costs are based, were much higher than in later years. As the economy, and the industry, recovered and the amount of avoided cost payments decreased.

[38] Florida Public Service Commission and the Department of Environmental Protection, *An Assessment of Renewable Electric Generating Technologies for Florida*, January 2003, 1-3.

[39] Section 11 of CS/SB 992 and section 5 of CS/HB 7229.

[40] J. Pollock Incorporated, *Renewable Energy Pricing Policy: A Report to the Florida Biomass Coalition*, March 3, 2010.

- Under federal and state law, avoided cost payments are based on the purchasing utility's incremental costs[41] of energy, capacity, or both, without regard for the embedded costs. Retail prices are based on embedded costs.
- The legislation requires payment of the increased avoided cost payment if specified capacity factor levels are met, without regard for whether utility capacity is actually being offset.
- The specified capacity factors translate into capacity factors of approximately 80 percent and approximately 65 percent. A typical new utility combined-cycle gas-fired plant is capable of maintaining a 97 percent capacity factor.[42]
- For these reasons, the bill will result in overpayment which will be subsidized by the general body of ratepayers.

Additionally, a proposal such as this would be subject to challenge under federal law, which preempts state law on this subject. Section 210 of the PURPA[43] prohibits states from requiring a public utility to purchase power at a price above its full avoided costs. The states do have authority to determine what those avoided cost rates are, but it cannot exceed the utility's actual avoided costs. Whether such a statute could survive a PURPA challenge would depend on whether there was sufficient proof that the standard adopted was in fact an accurate proxy for avoided costs.[44]

An intermediate step might be to require the PSC to do a study and file a report on what regulated utility costs are typically avoided by purchasing renewable energy, perhaps requiring suggestions on a defensible proxy, if appropriate.

2. Incentives Using Demand-side Renewable Energy in Conservation

A second type of mandatory-purchase incentive for renewable energy utilizes the Florida Energy Efficiency and Conservation Act (FEECA). In 2008, House Bill 7135 amended s. 366.82, F.S., to:

- define the term "demand-side renewable energy" to mean "a system located on a customer's premises generating thermal or electric energy using Florida renewable energy resources and primarily intended to offset all or part of the customer's electricity requirements provided such system does not exceed 2 megawatts";
- require that the PSC's goals for increasing the efficiency of energy consumption also include increasing the development of demand-side renewable energy systems to encourage development of demand-side renewable energy resources; and
- require the PSC to use a different test in approving cost recovery for efficiency programs, one that required consideration of:

[41] Incremental costs are the costs to produce the next increment of power. They involve present and near-future costs. Embedded costs are costs incurred in the past.

[42] The report states that the capacity levels in the report and bills compare well with those of utilities' plants. However, the author is focusing only on the annual capacity factor, which is defined as the annual kilowatt-hours generated by that unit divided by the product of the total hours in a year and the unit's net generating capacity in kilowatt hours (generation per year/8,700 hours x net generating capacity = annual capacity factor). Public Service Commission, *Florida's Electric Utilities: A Reference Guide*, 1994 edition, 21. The numbers Pollock uses for utility capacity factors appear to reflect their annual capacity factor. The comparison, however, ignores an additional factor, the economic dispatch curve. His clients each have one type of facility, which they will operate as often as they can, with the economics of doing so based on required utility purchases at an artificially high price. The utilities, on the other hand, have to operate, and to provide all their customers' needs, every second of every day. They have a blend of types of plants and fuels to accomplish this, and use, or dispatch, them based on both the capacity factor and the cost of operation. They always have idle power plants with the actual capacity to be operating, using others instead which operate less expensively. For a good discussion of economic dispatch, see Florida Energy 2020 Study Commission, *Florida . . . Energy Wise! : A Strategy for Florida's Energy Future, The Final Report of the Florida Energy 2020 Study Commission*, December 2001, 28-29.

[43] 16 U.S.C. s. 824a-3 (2006).

[44] The most recent application of these principles by the Federal Energy Regulatory Commission was in the consolidated dockets of California Public Utilities Commission, docket No. EL 10-64-000, and Southern California Edison Company, Pacific Gas and Electric Company, and San Diego Gas & Electric Company, Docket No. EL 10-66-000, reported at 132 FERC 61,047.

- The costs and benefits to customers participating in the measure.
- The costs and benefits to the general body of ratepayers as a whole, including utility incentives and participant contributions.
- The need for incentives to promote both customer-owned and utility-owned energy efficiency and demand-side renewable energy systems.
- The costs imposed by state and federal regulations on the emission of greenhouse gases.[45]

This statute could be expanded. It does, however, have a ratepayer impact (being, in effect, a roundabout way to increase price above avoided cost), the extent of which is not yet known.

Additionally the demand-side renewable energy provision raises questions. Prior to this amendment, in order for a utility to recover the costs of a specific proposed conservation or efficiency program, it had to establish that the program met the criteria of a cost-effectiveness test applied at that time, the Ratepayer Impact Measure Test (RIM test), sometimes referred to as the Non-Participant Test, as it measures benefits and costs from the perspective of the utility's ratepayers who do not participate in the program. This test focuses on the impact on rates; therefore, a program will not be deemed cost-effective if it results in a rate increase, even if it would result in considerable savings to participating ratepayers. The test is also referred to as the "no losers" test because a program that fails this test would require non-participating ratepayers to subsidize the benefits gained by those ratepayers who do participate in the program.

The effect of the amendment was to statutorily adopt the Total Resource Cost Test (TRC), which measures the net benefits and costs from the perspective of the utility and its ratepayers as a whole in order to maximize welfare. (Another test sometimes discussed is the Societal Cost Test, which is sometimes equated with the TRC and sometimes described as the TRC plus environmental externalities. Utilizing this test would require identifying and quantifying these externalities.) Because the RIM test does not allow cost recovery on programs that involve one group of ratepayers subsidizing another group, it is more restrictive than the TRC test, which does permit this cross-subsidization.

Even if the issue of cross-subsidization is set aside, there are other questions about using FEECA in such a manner. Many efficiency programs work by changing the consumptive behavior of customers or by improving property owned by a single ratepayer, such as improvements to the building itself, including more energy-efficient air conditioning and heating systems and other electronics and appliances, more insulation, better windows, and improved lighting. Because it is ratepayer behavior or property that must be changed, would it be more effective to give an incentive, such as tax breaks, grants, or low interest loans, directly to those property owners or purchasers of appliances who meet specified cost-benefit criteria for a conservation or efficiency project? Would such an approach better create a competitive marketplace for providers of goods that conserve energy or are more energy-efficient, thus creating economic development and competition to decrease prices?

3. Renewable Portfolio Standard (RPS)

A mandatory-purchase incentive that has been proposed in the Legislature on several occasions, beginning in 2002 and most recently in 2010, is a Renewable Portfolio Standard (RPS). An RPS is a law requiring that each utility produce or purchase a specified percentage of that utility's total retail sales of electricity from renewable energy resources, as that term is defined in the creating the RPS requirement. The goal of an RPS is to stimulate market and technology development so that, ultimately, renewable energy will be economically competitive with conventional forms of electric power.[46]

As was discussed above, Florida currently has two purchase-requirement statutes.[47] The primary focus of these statutes, however, is not on the amount of renewable energy to be purchased but rather the purchase price for the renewable energy. These statutes require each utility to purchase all of the renewable energy that producers can sell them at the purchasing utility's full avoided costs. In contrast, an RPS requirement would create a minimum

[45] These provisions were enacted in s. 39, ch. 2008-227, Laws of Florida.
[46] See, e.g., http://www.epa.gov/chp/state-policy/renewable_fs.html.
[47] ss. 366.051 and 366.91, F.S.

level of demand for renewable energy and either establish a price premium for that energy or leave the price to be established by competition among prospective suppliers to meet the mandated demand.

The first legislative RPS proposal was in the 2002 Regular Session when Senate Bill 1142 was amended to create the "Florida Renewable Energy Purchase Act."[48] The amendment required each public utility to ensure that at least 4 percent of the electric power sold in 2003 and each year thereafter was renewable energy. During floor debate, these provisions were removed from the bill.[49] They were replaced with a requirement that the PSC and the Department of Environmental Protection conduct a joint study to assess cost, feasibility, deployment schedules, and impacts on the environment of increased use of renewable energy and report to the Legislature.[50]

In 2008, an amendment was adopted to section 366.92, F.S., to require that the PSC adopt an RPS rule, to be ratified by the Legislature and not effective until ratification.[51] The approach proposed in the PSC report and the subsequent legislation[52] was that each investor-owned utility would continue to buy the electricity from renewable energy producers at full avoided costs, and would satisfy the RPS by purchase of renewable energy credits (REC), a certificate representing the additional value to society of using the renewable energy resource.[53] These utilities were required to meet or exceed a schedule for renewable energy production that started at seven percent by January 1, 2013 and ended at 20 percent by January 1, 2021. If a utility failed to meet the requirement for any reason other than an inadequate supply or a cost of compliance in excess of two percent of the investor-owned utility's total annual revenues from retail sales, the utility would be subject to a penalty for each day of noncompliance. The PSC was required to file a report by February 1 of 2010 and each year thereafter that detailed developments in the production of clean energy, how much and what types of clean energy are available in various regions of the state and at what cost, and any impediments to further increases in the production of clean energy in this state. It is likely that the PSC's development of the information for the initial report and the utilities' initial planning would take place simultaneously as the initial goal for each process would be to identify and quantify potential resources and costs. As such, if any significant problems were identified in either process with either supply or cost, the PSC report would have noted this and the Legislature could have reacted in time to avoid any harmful cost impacts to the utilities' ratepayers.

A similar bill was filed in the 2010 Regular Session, but was not heard.[54]

One concern that has been raised about the RPS approach is that government was picking winners and losers by singling out specified types of renewable energy that would be included and excluded, and that would receive higher or lower incentives. This is not necessarily bad; the difference in treatment is typically based on the issue discussed above as to prioritizing between fuels and technologies that produce better results and those that have better future promise. Additionally, a law that does not expressly make these distinctions also picks winners and losers, albeit indirectly. Without additional subsidies in the earlier years of subsidy programs, those technologies that cannot economically compete are losers, and there likely will be no development of these technologies, no

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[48] Amendment barcode 972342, adopted on March 6, 2002, by the Senate Committee on Regulated Industries. This amendment was adopted as traveling amendments, that is, it was not engrossed into a committee substitute for the bill.
[49] Amendment barcode 972342 failed on the Senate floor vote on March 21, 2002.
[50] Amendment barcode 810442, adopted on March 21, 2002. The PSC/DEP study is *An Assessment of Renewable Electric Generating Technologies for Florida*, Florida Public Service Commission and the Department of Environmental Protection, January 2003, available at http://www.psc.state.fl.us/publications/reports.aspx#eng.
[51] s. 366.92(3), F.S. The PSC conducted rulemaking proceedings and filed a report with the Legislature, but did not actually adopt any RPS rules. Draft Renewable Portfolio Standard Rule: Submitted to the President of the Senate and the Speaker of the House of Representatives to Fulfill the Requirements of Section 366.92(3), Florida Statutes, Florida Public Service Commission, January 30, 2009.
[52] During the 2009 Regular Session, Senator James "Jim" King sponsored a bill, SB 1154, to enact an RPS that expanded upon the recommendations in this report. The bill passed the Senate but died in the House of Representatives.
[53] Typically, a renewable energy producer is considered to produce two products, the electricity and a separate renewable energy credit or "REC." The REC represents the societal benefit received from using a renewable energy fuel or technology as opposed to conventional fuels and methods. The REC typically represents one megawatt hour (MWh) of renewable energy that is sold onto the grid. The two products may be sold together or separately, depending on the law and the sales contract.
[54] Senate Bill 596, sponsored by Senator Nancy Detert.

decrease in their costs, and no benefits of their use. [55]

Another concern about the RPS approach is that the utilities' ratepayers pay all of the additional costs, and most of them receive no direct benefit, only the indirect benefits of the underlying policy goal, the better fuel security, lower carbon emissions, or other benefit. Only those who can afford to install a renewable energy system on their property get the direct benefit of reduced utility bills and an income stream, which gives rise to the complaint that the poorer ratepayers are subsidizing the wealthier ones.

According to the U.S. Department of Energy, 24 states have an RPS.[56] These laws vary tremendously as to what types of utilities are subject to the requirement, what types of fuels and technologies are included,[57] what amount or percentage of renewable energy is required, whether any fuels or technologies are given preference in terms of either the amount to be purchased or the price to be paid, whether all or a portion of the renewable energy must be produced in the state, and how quickly the renewable energy must be produced.

The ultimate costs and benefits of an RPS depend on the particular types of fuels and technologies authorized and actually used, any prioritization among current and future benefits, the amount of renewable energy available and produced, and the amount of cost to ratepayers.

4. Feed-in Tariff

A feed-in tariff (FIT) is a law requiring that retail utilities purchase electricity produced by specified types of technologies at specified prices for a specified period of time, with different prices usually set for different technologies. The utility passes the extra cost on to its ratepayers. A bill was filed in the 2010 Regular Session to create a voluntary FIT.[58] It was not placed on an agenda or heard by a committee.

The FIT approach appears to have two primary advantages. The first is the mandatory high purchase price and the fact that it is locked in for 20 years, which establishes a certain revenue stream that helps in obtaining financing. The second is the lack of red tape involved in programs such as a subsidy program or REC market.[59]

FIT incentives are popular with renewable energy producers, sometimes so much that costs can spiral out of control. For example, Spain was forced to cap the number of solar installations it would subsidize, and Ontario had to suspend its program after being oversubscribed. In Gainesville, just a few days after the ordinance was adopted, the city reached its cap on solar payments for the first and second years.[60]

Costs and benefits of the FIT approach again depend on the particular types of technologies that can qualify for the FIT price, any preference among these technologies, the amount of renewable energy produced, and the amount of cost to ratepayers.

The cost per ratepayer can be relatively low. For example, in Germany the tariff price for solar photovoltaic is about four times the retail price for conventional electricity.[61] Despite this high purchase price per kilowatt hour, photovoltaic-produced energy in Germany is still below 1 percent of the total energy production so the average

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[55] This is neither a new issue nor one limited to renewable energy resources. With conventional fuels and technologies, similar choices must be made as between a power plant that is less expensive up-front but may have higher costs later, like a natural gas combined cycle plant, and one that is more expensive up-front, but may have lower costs later, like a nuclear plant. Permitting and constructing of the natural gas plant costs significantly less and is much quicker so the near-term benefits are greater. In contrast, permitting and constructing the nuclear plant is costly and time-consuming, but the fuel is much less expensive and, historically, much less subject to price fluctuations

[56] http://apps1.eere.energy.gov/states/maps/renewable_portfolio_states.cfm

[57] Some include conservation and efficiency methods and one, Ohio, includes "alternative energy resources" which includes third-generation nuclear power plants and clean coal technology that can control or prevent carbon dioxide emissions. http://www.legislature.state.oh.us/bills.cfm?ID=127_SB_221

[58] SB 2346 from the 2010 Regular Session.

[59] See, e.g., http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2007/08/29/EDDGRQG08.DTL

[60] http://www.nytimes.com/2009/03/13/business/energy-environment/13solar.html

[61] See, e.g., http://www.guardian.co.uk/business/2007/jul/23/germany.greenbusiness

household utility bill has increased less than $1 a month as a result of the additional cost of the feed-in law.[62] If a significant amount of renewable energy was achieved, however, the impact on a customer's bill would, of course, increase.

Opponents of FITs argue that they disproportionally impact poor people because a relatively high percentage of their income goes to pay utility bills.[63]

An additional issue with FIT incentives is that they may be held to be preempted by federal law and to be in violation of PURPA's prohibition on requiring a public utility to pay more than its avoided cost for electricity, as was the case recently with a California FIT that applied to public utilities.[64]

5. Incentives for Production by a Public Utility

Section 366.92(4), F.S., enacted in 2008, provides for full cost recovery by a public utility of all reasonable and prudent costs incurred for renewable energy projects that are zero greenhouse gas emitting at the point of generation, up to a total of 110 megawatts statewide. This authorization resulted in three solar projects by Florida Power and Light: a 25 megawatt solar photovoltaic project in Desoto County; a 75 megawatt solar thermal project co-located with an existing combined-cycle power plant in Martin County; and a 10 megawatt solar photovoltaic project located at Kennedy Space Center. The projects add a substantial amount of solar energy quickly, as opposed to numerous small projects.

There have been numerous proposals to expand this authority. Some created additional authority, including:

- Permitting recovery, in addition to the full cost recovery for the renewable energy projects, of a return on equity of not less than 50 basis points above the top of the range of the provider's last authorized rate of return on equity, approved by the commission for energy projects, if a majority value of the energy-producing components incorporated into such projects are manufactured or assembled within this state.[65]
- Providing that any competitively procured purchased power agreement for solar power which is voluntarily executed by an investor-owned utility on or before March 1, 2009, must be presumed prudently incurred, with the costs exceeding the utility's full avoided costs for the purchased power to be recoverable through the environmental cost-recovery clause if specified conditions were met.[66]
- Exempting a renewable energy generating facility constructed or converted from an existing fossil fuel generating facility under the expanded authority from the requirement of a determination of need under section 403.519, F.S.[67]
- Adding recovery for the costs of the reasonable and prudent costs for conversion of existing fossil fuel generating plants to a Florida renewable energy resource, including the costs of retirement of the fossil fuel generation plant.[68]

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[62] See, e.g., http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2007/08/29/EDDGRQG08.DTL

[63] http://www.nytimes.com/2009/03/13/business/energy-environment/13solar.html

[64] The consolidated dockets of California Public Utilities Commission, docket No. EL 10-64-000, and Southern California Edison Company, Pacific Gas and Electric Company, and San Diego Gas & Electric Company, Docket No. EL 10-66-000, reported at 132 FERC 61,047.

[65] SB 1186 and HB 7229, 2010 Regular Session. Rewarding the utility for having the location of the manufacture or assembly in this state is questionable since that location will be due to the decisions and efforts of the manufacturer, not the utility.

[66] Section 15 of CS/SB 992, 2010 Regular Session.

[67] SB 1186 and HB 7229, 2010 Regular Session. There is some question as to whether any renewable energy project should be required to obtain a determination of need. The determination of need is to prevent a utility from building an unneeded facility at its ratepayer's expense. Renewable energy is valued not because it can meet the need for electricity (it frequently cannot be relied upon to meet the base underlying need) but because it provides other societal benefits. If the Legislature wants a significant amount of renewable energy, it must consider the effect of the determination of need on creating these new facilities, the issue of redundant generation facilities, and the transition to including renewable energy facilities in the generation fleet.

[68] SB 1186 and HB 7229, 2010 Regular Session. Converting existing fossil plants to renewable energy facilities is another consideration in the transition to a greater amount of renewable energy in the generation fleet. This transition was discussed briefly above in section A.3. of the Background section above.

Some of these proposals contained additional limitations, including:

- Requiring that a public utility petitioning for PSC approval of a proposed project show that it has submitted the project for competitive bid to ensure that it is the most cost-effective alternative that meets the criteria of the section and that the projected costs are reasonable and prudent for the type of project, and that the proposal includes mechanisms to keep costs from increasing above the projected amount.[69]
- Limiting the amount of recovery of costs in excess of the provider's full avoided cost to no more than a specified percent, for example 2 percent, of the provider's total revenues from the retail sale of electricity for calendar year 2009.[70]
- Requiring that revenues derived from any renewable energy credit, carbon credit, or other mechanism that attributes value to the production of renewable energy that is received by a provider by virtue of the production or purchase of renewable energy for which the cost recovery is approved be shared with the provider's ratepayers, such that the ratepayers are credited at least a specified percentage, such as 75 or 90 percent, of such revenues.[71]
- Requiring that at least 20 percent of the total nameplate capacity for which a provider is permitted to recover costs in any calendar year be produced or purchased from renewable energy resources other than solar energy.[72]
- Requiring that the total amount of the newly expanded amount of renewable energy be divided evenly between solar and nonsolar forms of renewable energy, requiring a competitive bid for any solar project, and prohibiting cost recovery for any solar project that does not have a firm commitment for the production or purchase of an equal amount of nonsolar renewable energy.[73]

Several of these limitations focus on nonsolar renewable energy. The reason for this, as discussed above, is that some forms of renewable energy cost more than others and some forms produce more energy than others. Solar tends to be the most expensive and to produce the least energy. So, to the extent that any expanded authority for regulated utility full cost recovery for renewable energy requires production of nonsolar renewable energy, it provides for production of more energy at a lower cost.

Another potential limitation is prohibiting recovery of costs for any project that are in excess of:

- 300 percent of the levelized cost of energy for a natural gas combined cycle power plant; or
- 150 percent of the levelized cost of energy for a natural gas combustion turbine power plant.[74]

Any of the proposed expanded full cost recovery authorizations will result in an increase in ratepayer prices, with the amount of the increase dependent upon the terms of the expansion and any limitations, the total project costs, and the number of ratepayers among whom the cost is divided.

C. Voluntary purchase

1. Voluntary green energy programs

A voluntary green energy program is a utility program in which its customers can voluntarily pay an additional charge each month to purchase renewable energy. An example of such a program is Georgia Power's Green

[69] Section 13, CS/SB 992, 2010 Regular Session.
[70] SB 1186 and HB 7229, 2010 Regular Session.
[71] SB 1186 and HB 7229, 2010 Regular Session.
[72] HB 7229, Second Engrossed, 2010 Regular Session.
[73] Senate floor amendment barcode 492856 to CS/HB 7179, 2nd Eng., withdrawn on third reading on April 30, 2010.
[74] These limitations were developed using cost estimates in the Navigant report prepared when the Public Service Commission was doing its Renewable Portfolio Standard rulemaking, of a levelized cost of energy for natural gas combined cycle of 6.5 cents per kilowatt hour and for natural gas combustion turbine of 14.3 cents per kilowatt hour. Based on these cost estimates, 300 percent of the levelized cost of energy for a natural gas combined cycle power plant would be approximately 19.5 cents per kilowatt hour, and the 150 percent of the levelized cost for a natural gas combustion turbine power plant would be approximately 21.45 cents per kilowatt hour. Because the Navigant cost figures were only estimates, the amount of the limitation is only an estimate as well.

Energy program. [75] Under this program, voluntarily created by Georgia Power, a residential customer can voluntarily buy a 100-kilowatt-hour block of Standard Green Energy for a 12-month period (about 10 percent of an average monthly residential electricity bill) for an additional $3.50 (plus tax) to the monthly electricity bill. A residential customer can also choose to purchase Premium Green Energy that contains both biomass and a solar energy component at $5.00 (plus tax) per block added to the monthly electricity bill, with least 50 percent of the renewable energy to come from solar resources. Commercial and industrial customers can also participate with a minimum block purchase based on the amount of energy used as defined in the Green Energy Tariff. After meeting the initial minimum block purchase, a large volume purchase option is available at a reduced cost.

Georgia Power uses funds from this program to purchase renewable energy, paying $0.17 per kilowatt hour to solar energy producers, pursuant to 5-year contracts, with a maximum system size of 10 kW for residential systems and 100 kW for commercial systems, up to an aggregate capacity of one megawatt (1,000 kW).[76] The program and rates are approved by the Georgia PSC.

Florida could do something like this with a statute that authorizes the PSC to approve a voluntary green energy program under which customers voluntarily pay a premium for renewable energy, but require that that energy actually be produced and purchased in Florida. To avoid potential costs to the general body of ratepayers, it would be best if the amount of utility purchases were limited to amounts already voluntarily "subscribed" for. Such a statute could look something like the following:

> The commission may approve a tariff under which a utility may offer its ratepayers a voluntary program in which ratepayers choosing to participate in the program may pay an additional monthly charge which will be used to purchase renewable energy produced in Florida at a price above the utility's full avoided cost. The amount of the charge may be differentiated based upon whether the energy purchased will include electricity produced by solar energy systems. The commission may adopt rules necessary to implement this section. All rules and tariffs must protect the general body of ratepayers from any costs associated with any program established under this section.

Creation of a voluntary green energy program would have no impact on ratepayers other than those who voluntarily participate. Participation levels would depend on the terms of the program, which are likely to vary among utilities that choose to participate. Customer participation levels would also depend on the economy and the ability of customers to participate. Given the lack of impact on customers' rates, this might be an option the Legislature may wish to pursue.

2. Limited Direct Retail Sales by Renewable Energy Producers

Another voluntary incentive would be to allow an electricity customer or group of customers to contract with a provider of renewable energy to sell electricity at retail directly to the customer or customer group. Under current law, only a regulated utility, municipal utility, or cooperative utility can sell electricity at retail. A person or business can produce its own electricity, but cannot contract with a non-utility to do so; the person or business must own and operate the production facilities.[77] Energy use tends to cluster around high density areas of human activity, such as industrial parks, commercial warehouses, and homeowners' associations, that are comprised of members that can be served by on-site electricity generation. There has been interest in recent years in allowing

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[75] Green Energy program details taken from http://www.georgiapower.com/green/home.asp.

[76] Purchase program details taken from http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=GA46F&re=1&ee=1

[77] Chapter 366, F.S., requires that each "electric utility" comply with its requirements, and defines that term to include every person or entity supplying electricity to the public. s. 366.02, F.S. The Florida Supreme Court has interpreted this to mean that a non-utility can produce electricity for its own use, but cannot sell any excess at retail to any other person or entity. *PW Ventures, Inc. v. Nichols*, 533 So. 2d 281 (Fla. 1988).
Additionally, to build a power plant with a capacity of 75 megawatts or more requires a determination of need. s. 403.506, F.S. To petition for a determination of need, the proposed power plant owner must be a regulated investor-owned utility, a municipal electric utility, or a cooperative electric utility serving retail customers. s. 403.519, F.S., *Tampa Electric Co. v. Garcia*, 767 So. 2d 428 (Fla. 2000), and *Panda Energy International v. Jacobs*, 813 So.2d 46 (Fla. 2002).

such an entity to contract with a renewable energy producer to supply the entity's electricity.

Eight other states have authorized limited direct retail sales by producers of renewable energy: New Hampshire, California, Connecticut, New York, Colorado, Nevada, New Mexico, and Oregon.[78] There is quite a variety among them on points such as who can sell, to whom, whether multiple customers could be served, what constitutes a sale on the same parcel, and whether out of state corporations can make retail sales.

New Hampshire

The New Hampshire Legislature authorized direct sale of retail electric power by qualifying facilities (QF) with enactment of the Limited Electrical Energy Producers Act (LEEPA).[79] LEEPA uses PURPA-type language, but smaller size facilities. The maximum size for a qualifying small power producer is 20 Mw.[80] A new category was created, the "Limited Electrical Energy Producer," defined as a small power producer or cogenerator with maximum nameplate capacity of no more than 5 Mw, and allowed to sell to more customers, up to three customers.[81]

From 1996-2000, when it deregulated its electric industry, renewable energy production by independent power producers (IPP) increased by over 310,000 Megawatt hours, or 27 percent.[82] After deregulation, growth in IPP renewable energy production slowed, despite increased demand for retail electricity. From 2001 to 2005, growth slowed to 18.86 percent. Then, from 2006 to 2008, it slowed to 6.81 percent.

California

In 1987, the California Public Utilities Commission (PUC) exempted an "electrical corporation" that employs a non-conventional power source from regulation, allowing retail sales by non-utility producers of renewable energy to no more than two unrelated customers that were located on "adjoining" properties.[83] The California Legislature deregulated its electricity industry in 1998. The legislation directed the PUC to suspend the right of retail customers within a public utility's service area to enter into new contracts to purchase electricity from non-utility sources.[84]

Unlike the other three states with direct retail sales by non-utility renewable energy producers prior to deregulation, California experienced accelerated growth of IPP production of renewable generation after restructuring. This may be due to additional incentive programs for renewable energy. One such program was created by the Ratepayer Protection Act, which allows a three to five year phase-in for nonresidential end-use customers to purchase electricity directly from "other providers in each electrical corporation's [utility] distribution service territory," up to an overall historical maximum-load amount in each utility territory.[85]

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[78] All information on limited direct retail sales in other states is taken from Sean White, *Direct Retail Sales of Electricity by Independent Renewable Energy Providers: Building a Market for Renewable Energy in Non-Restructured States*, Spring 2010.

[79] N.H. Rev. Stat. ch. 362 § A (2009).

[80] LEEPA, N.H. Rev. Stat. ch. 362 § A:1.

[81] LEEPA, N.H. Rev. Stat. ch. 362 § A:1-a (2009).

[82] All data on the effects of deregulation on prior programs allowing direct retail sales by producers of renewable energy is taken from Sean White, *Direct Retail Sales of Electricity by Independent Renewable Energy Providers: Building a Market for Renewable Energy in Non-Restructured States*, Spring 2010. The figures were calculated using data on amounts of IPP renewable energy production from 1990 to 2008 from the Energy Information Administration (EIA), EIA, *Electric Power Annual with data for 2008: 1990 - 2008 Net Generation by State by Type of Producer by Energy Source* (EIA-906), (Jan 2010). *available at*: http://www.eia.doe.gov/cneaf/electricity/epa/epa_sprdshts.html

[83] Cal. Pub. Util. Code §§ 216, 218(b).

[84] Direct Access contracts existing prior to September 20, 2001, were allowed to remain in place. California PUC, *Interim Opinion Suspending Direct Access*, Docket No. 01-09-060 (Sep 20, 2001).

[85] Ratepayer Protection Act, California Senate Bill 695.

Connecticut

In 1995, the Connecticut PUC ruled that a qualifying facility could sell power to adjacent facilities.[86] A retail sale could take place regardless of whether the electricity consumer was on-site or off-site, so long as a sale to off-site entities did not send electric power across a public right-of-way or highway. Additionally, the QF was not subject to state franchise laws, nor was the sale regulated as a traditional retail sale. This broadly allowed QFs to sell where they wished without being subject to regulation. The Connecticut Supreme Court limited the PUC ruling in a 1998 case in which it found that the state law prohibiting foreign corporations to sell electricity in-state applied to a QF selling under the ruling.[87]

During Connecticut's five year program, renewable generation by IPPs grew by nearly 400,000 Megawatt hours, equivalent to a 43.45 percent growth rate. Total retail sales of electricity in Connecticut were growing by about five percent during this timeframe. After restructuring, renewable generation by IPPs not only slowed, but experienced net decreases. Meanwhile, retail sales continued to grow between four and nine percent.

New York

The New York Public Service Commission (NYPSC) in 1996 reversed a prior decision that an industrial cogenerator which sold electricity to another unrelated industrial entity would be regulated as a utility, ruling that a company can supply electric power to other tenants on its property.[88] Thus, Grumman Aerospace Corporation was allowed to compete with regulated utilities at a 500 acre site on Long Island. Because of its own reduced power consumption requirements, Grumman had surplus power it received from a third-party on-site cogenerator. The NYPSC allowed it to sell the surplus power to adjacent properties. FERC permitted the power to be sold at market-based rates, so long as it did not interfere with the cogenerator's grid access.

New York deregulated the electricity industry in 2001. In the intervening five-year period, IPPs generated 56.75 percent more renewable energy than during the preceding five-year period. In the first five years of retail choice there was a decreased growth rate, despite increasing overall retail sales. From 2006 to 2008, all retail sales experienced a net decrease of nearly a percent. Nonetheless, IPP renewable generation grew by 40.14 percent.

Colorado

In a 2007 RPS compliance docket, the Colorado PUC ruled that the "Developer Model" proposed by Public Service Company of Colorado (PSCo) complied with the Colorado Renewable Energy Standards (RES) rules and state law.[89] Under the Developer Model, a third-party developer owns and maintains renewable generation installations on customer sites, contracts with the end-use customer for the sale of electricity generated, enters into an interconnection agreement with the utility, and enters into a contract with the utility to monthly sell RECs directly.[90] The end-use customer is eligible for net-metering.[91] PSCo, a regulated utility, maintains its exclusive right to sell electric energy within its commission-certified service territory and that PSCo waives this right only to the extent necessary to facilitate the installation of on-site renewable systems to comply with the RES. The PUC found that the arrangement did not make the developer a public utility, since the third party developer will not sell excess generation from the solar facility to any other entity, and because there is no opportunity for a

[86] Connecticut Dept. of Public Utility Control, Docket No. 95-08-04 (Nov 7, 1995).
[87] *Connecticut Light & Power Co. v. Texas-Ohio Power Co.*, 708 A.2d 202 (Conn. 1998).
[88] Such a sale would require a certificate of convenience and necessity, but may be subject to expedited and limited regulatory requirements. Re: Grumman Aerospace Corp., New York P.S.C. Docket No. 93-E-0999 (Jan. 26, 1994).
[89] Colo. P.U.C., Docket No. 06A-478E, Decision No. Co7-0676 (Aug 8, 2007).
[90] *Id*. at 3.
[91] The U.S. Department of Energy describes "net metering" as an arrangement in which a single, bi-directional meter is used to record both electricity taken from the grid and excess electricity fed back into the grid. The meter spins forward as electricity is taken from the grid and backward as the excess is fed into the grid. If, at the end of the month, the customer has used more electricity than it has produced, it pays retail price for the balance. If the customer has produced more than it has used, the utility generally pays for the extra at its avoided cost; some utilities now allow carryover of the credit balance from month to month, with a netting at the end of the year. The real benefit of net metering is that the utility essentially pays retail price for the electricity fed back into the grid. http://www.energysavers.gov/your_home/electricity/index.cfm/mytopic=10600

developer to "cherry pick" customers or impose more burdens on residential and commercial customers of PSCo. In 2009 the Colorado Legislature codified the RES and exempted small non-utility producers of renewable energy from PUC regulation.[92] The third party exemption applies only to "owners or operators of solar generating equipment sized to supply no more than one hundred twenty percent of the average annual consumption of electricity" at that site.

Nevada

In 2008, the Nevada PUC determined that third party owners of net metered renewable energy systems are not public utilities.[93] The following year, the Nevada legislature codified the PUCs decision by excluding renewable energy producers from the definition of "public utility," so long as sales are not made to more than one customer of a public utility per system.[94] Systems must be located on the premises of another person, must be used to produce not more than 150 percent of that other person's annual electricity requirements, and cannot be part of a larger system that aggregates electricity generated from renewable energy for resale or use on premises other than where the individual system is located.

New Mexico

On December 17, 2009, the New Mexico PUC ruled that it would not regulate as a public utility a third party developer that owns renewable generation equipment installed on a utility customer's premises pursuant to a long term electricity supply contract with the customer. Also, a third party developer that owns renewable generation equipment installed on a utility customer's premises may use this equipment to serve portions of multiple customer's electricity use. However, a third party developer may not use a public utility's distribution lines or equipment in order to route electricity to multiple customers.

Oregon

The Oregon PUC has determined that an on-site third party owner of a wind or solar-powered net-metering facility is not a public utility because it was not using the utility's distribution system and thus was not providing electricity services that could be regulated.[95]

Authorizing direct retail sales by a provider of renewable energy to an electricity customer or group of customers would have to be done on a very strict basis to avoid detrimental impacts to the particular utility's other ratepayers. It could be done at a variety of levels, from being strictly limited in location and size to using only those limitations necessary to protect the general body of ratepayers.

Perhaps the simplest approach to adopting a similar law in Florida with the least impact on ratepayers, would be a variation of a provision in a 2010 bill.[96] The bill authorized a developer of solar energy generation to locate a solar energy generation facility that has a gross power rating of 2 megawatts or less on the premises of a host consumer and supply electricity exclusively for sale to the host consumer for consumption only on the premises or contiguous property owned or leased by the host consumer, regardless of interruptions in contiguity caused by easements, public thoroughfares, transportation rights-of-way, or utility rights-of-way, if premises or contiguous property does not include a multifamily residential building. It required the commission to adopt rules to implement this provision, which must establish, at a minimum:

- requirements related to interconnection and metering;
- a mechanism for setting rates for any service provided to the consumer by the utility if such service is required by the consumer, which rates must ensure that the utility's general body of ratepayers does not subsidize any redundant utility generating capacity necessary to serve the consumer; and

[92] C.R.S. ch. 40 § 1-103, codified in SB51.
[93] Nevada PUC, Docket No. 07-06024.
[94] Nev. Stat. ch. 704 § 021, codified in Assembly Bill 186.
[95] Oregon PUC, Docket No. DR 40, Order No. 08-388 (July 31, 2008).
[96] Section 9 of Florida House of Representatives Bill 7229 in the 2010 Regular Session.

- requirements for notice to the commission of the size and location of each renewable energy generation facility planned under this provision, the identity and historical and projected load characteristics of each host consumer, and any other information deemed necessary by the commission to satisfy its resource planning obligations under s. 366.04(5), F.S.

The commission was also required to submit to the Legislature, beginning January 1, 2011, and at least once every 6 months thereafter, a report of activity under this new authority, which must address the impacts of such activity on the electric power grid of the state, individual utility systems, and each utility's general body of ratepayers, and include recommendations concerning implementation of this program.

At the other end of the spectrum would be authority without limitation as to size or location of the facility, using restrictions such as those listed below.

- The retail relationship between the renewable energy producer and customer would be governed solely by the purchase contract, with any disputes going to the courts for resolution.
- If the customer or renewable energy producer wants to receive any services from the utility, the customer or producer must negotiate a contract with the utility for those services.
- The customer or producer must pay the utility a reasonable price for all services, including:
    - standby power or a capacity charge so the customer or producer, not the utility's ratepayers, pays for redundant capacity or other costs that may otherwise become stranded costs[97];
    - electricity provided when the renewable energy facility is not producing, at rate specified in the contract based on new usage projections;
    - interconnection and metering; and,
    - a reasonable wheeling fee if any transmission is required or requested.
- The utility may need to recover other embedded costs through exit fees.[98]
- There cannot be any preference or discrimination relating to restoration of service due to a utility power plant or power line outage.
- The utility is not responsible for any services outside the terms of its contract with the customer or renewable energy producer.
- Both the utility providing ancillary services and the purchaser of those services must negotiate in good faith to enter into a fair, reasonable, and nondiscriminatory contract, and either party may petition the PSC for resolution of any disputes. For consistency and long-term efficiency, it might be best if the PSC established guidelines as to these types of contracts.[99]
- If the renewable energy producer ceases to provide electricity to the customer, the utility serving that territory has no obligation to the customer beyond that owed to a new customer and does not have to assume operation of any power production or distribution facilities previously operated by the renewable energy producer.
- Most important, all statutes, contracts, and tariffs must be interpreted and implemented to protect the general body of ratepayers from any costs associated with any contractual arrangement established under this section.

As additional incentive, the renewable energy producer could sell any excess onto the grid at full avoided costs.

Authorizing renewable energy producers to sell at retail would have consequences to utility ratepayers, even if they were successfully shielded from immediate cost and price consequences. As discussed above, when a non-utility is producing and selling electricity previously produced and sold by a regulated utility, that utility loses revenue needed to recover its embedded costs. If this retail-sale authority were designed properly, and

[97] Stranded costs are those costs incurred under a regulatory system that exceed the amount that can be recovered under a new or revised system of regulation.

[98] An exit fee is "a one-time fee imposed on a departing utility customer who elects either to generate its own electricity or buy its electricity from another source," and that "compensates the utility for the customer's share of the utility's stranded costs." Steven Ferrey, *Exit Strategy: State Legal Discretion to Environmentally Sculpt the Deregulating Electric Environment*, 26 Harv. Envtl. L. Rev. 109, 109 (2002).

[99] There is a similar current provision relating to purchases of energy for full avoided costs under s. 366.051, F.S., where the PSC is directed to establish guidelines for the purchase contracts.

implemented properly, it may be possible to limit long-term consequences through regulated utility plant retirements, as discussed above. It is highly unlikely that all cost consequences can be avoided, and each regulated utility's situation will be different, which means each body of ratepayers' situation will be different.

Also, these contracts would raise the obligation-to-serve and grid-impact issues discussed above.

This approach is voluntary, so no one has to purchase anything or pay a share of a project that they receive no direct benefit from. Economics determine which renewable energy producers can sell and at what price. It is likely that the customers that choose this option will be among the utility's highest-use customers, their best customers for revenue purposes. However, there would be intermediate and long term cost and rate impacts, as previously discussed.

3. Regulated Utility Sales outside of Regulation

A similar alternative would be to allow a regulated utility to enter into such a contract. If a regulated utility, or a group of regulated utilities, were authorized to contract to provide renewable energy to a customer or an identifiable customer group and to charge that customer or group of customers more than PSC-approved rates, this would have no impact on the general ratepayer base, only on those who choose to enter into a contract. This is likely to be desired by, and to work with, only a single, large customer, or a new development, such as the City of Babcock Ranch. This alternative would spread the cost over a much smaller group of ratepayers, but it would be those who directly benefit from the project. It should be done only with strict limitations such as those discussed above to protect the utility's general body of ratepayers and the systems of electricity production and its regulation.

To the extent that there is an indirect benefit (the un-specified, general societal benefit of renewable energy), it is unclear whether this benefit is to only the remaining ratepayers of the contracting public utility or to everyone else in Florida, or perhaps even the nation or the world. This depends on the as-yet-undetermined nature and extent of those societal benefits. As such, from a policymaking perspective, it is unclear who should bear the cost of indirect societal benefits: the identified customer or customer group, the remaining ratepayers, or all Floridians. If the last, it might be more equitable to establish a fee or tax revenue source and create a public benefits trust fund to fund a portion of the costs of these projects.

This approach is voluntary, so no one has to purchase anything or pay a share of a project that they receive no direct benefit from. Economics determine which renewable energy producers can sell and at what price. It is likely that the customers that choose this option will be among the utility's highest-use customers, their best customers for revenue purposes. There again would be intermediate and long term cost and rate consequences to ratepayers.

D. Funding source

1. Public Benefits Fund

Public benefits funds have been used in other states as part of a renewable energy incentive program. The public benefits fund simply establishes a dedicated funding mechanism, using taxes or fees as revenue; the actual incentive mechanisms used are usually to those discussed in this report.

The first legislation to create a renewable energy public benefits fund was filed in 2002.[100] It created a 2.8 mils[101] per kilowatt hour public benefits charge to be assessed to each end-use customer and divided the proceeds among four purposes: energy efficiency programs; comprehensive low-income residential energy efficiency programs; clean energy programs; and research and development on energy efficiency and clean energy. The PSC staff estimated the amount of revenue that would be collected based on 2000 electric sales to be $548,400,000.

[100] Section 3 of SB 2472, 2002 Regular Session, sponsored by Senator Walter "Skip" Campbell.
[101] One mill equals $.001.

In 2004, two amendments were filed to create a surcharge on electricity sold.[102] The first created a surcharge of one quarter mil per kilowatt hour sold at retail.[103] The second, filed as a substitute for the first, created a surcharge of one tenth mil per kilowatt hour sold at retail.[104] This amendment also provided that if the balance of the trust fund was ever 100 million dollars or more at the end of a fiscal year, application of the surcharge was to be suspended until the fiscal year following the decrease of the balance to 50 million dollars or less. As the average residential monthly electricity usage at the time was 1,000 kilowatt hours, this would have created a residential surcharge of approximately ten cents per month. The total collected each year was projected to be approximately 22 million dollars.

In 2009, a different funding approach was taken, creating a charge of 1 cent per gallon on all gasoline, alternative fuel containing alcohol as defined in s. 525.01(1)(c)1. or 2., diesel, kerosene that is not used as aviation turbine fuel, and #1 fuel oil for sale or use in this state.[105] The revenue from the fee was to be divided, with one half to be deposited into the Florida Renewable Energy Trust Fund (created in another bill) and one half deposited into the General Revenue Fund unallocated. These provisions were deleted from the bill at its second committee of reference.

A public benefits fund is not an incentive itself, only a funding mechanism, and it will always be funded by a tax, a fee or surcharge, or both.

2. Local Option

Although it is outside the scope of this committee, another potential funding source would be authorizing funding of the expenses of production or purchase of renewable energy by creation of a municipal special assessment pursuant to chapter 170, F.S., a special district pursuant to chapter 189, F.S., a community development district pursuant to chapter 190, F.S., or other similar mechanism. This, again, would likely have limited application.

3. Renewable Energy Credits without an RPS[106]

Renewable energy producers can produce two products, the electricity and a separate renewable energy credit (REC). The REC represents the societal benefits from one megawatt hour (MWh) of renewable energy that is sold onto the grid.[107] The two products may be sold together or separately, depending on the law and the contract.[108]

Although RECs are usually used in conjunction with an RPS requirement, it may be possible to create a Florida

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[102] Senate committee amendments barcode 052550 and barcode 482970 to CS/SB 1316, by Senator Michael Bennett, filed in the Senate Committee on Natural Resources for its meeting on Monday, March 22, 2004. Neither amendment was adopted.
[103] This is $0.00025.
[104] This is $0.00010.
[105] SB 1154, 2009 Regular Session, sponsored by Senator James "Jim" King.
[106] Carbon credits are beyond the scope of this project as they have much broader application than renewable energy, with possibly greater potential for forestry, for example than for renewable energy producers, but they could also benefit renewable energy producers and other businesses in Florida.
[107] The value of electricity produced by use of renewable resources has two components, the value of the generic electricity itself and the value of the environmental and other societal benefits of producing that electricity by using the renewable resources instead of traditional fuels and methods. To create a renewable energy certificate, the two components are "unbundled" or separated, with the renewable energy certificate representing the second value component. To enable widespread sales of the certificates, they must be standardized as to what quantity of renewable energy they represent. The typical standard is the one megawatt-hour standard adopted in the 2008 legislation. Thus, a renewable energy certificate represents the economic value of the environmental and other societal benefits associated with producing one megawatt-hour of electricity using renewable resources instead of traditional fuels and methods. http://www.awea.org/greenpower/gp_how2.html The amount produced or used over time is measured in kilowatt hours, calculated by multiplying the number of kilowatts produced or used by the length of time of production or use. To illustrate in the familiar context of residential electricity use, one kilowatt-hour of electricity would be used by either burning ten 100-watt light bulbs for one hour or operating one two-kilowatt air conditioner for one-half hour. One megawatt is 1,000 kilowatts, thus, a renewable energy certificate standard of one megawatt-hour represents one megawatt, or 1,000 kilowatts, of electricity produced steadily for one hour.
[108] See, e.g., http://www.epa.gov/grnpower/gpmarket/rec.htm.

REC, and any requisite certification system, without creating an RPS requirement, thus allowing sale of the REC into other states that have markets.

The costs and benefits of this approach are highly speculative. For a REC to be marketable, it would have to meet any requirements of the desired market. This could raise issues with method of certification and type of renewable energy used to produce the certificate. It may be that no market would purchase RECs produced by municipal solid waste or waste heat, which currently produce the majority of renewable energy in Florida, and some may not purchase energy from biomass, which is another high-output potential source in Florida.

Summary

Most of the available incentive alternatives have a ratepayer (or taxpayer) cost impact, including:

- government-funded rebates, tax breaks, or loans;
- a change to the avoided costs standard;
- the FEECA demand-side renewable energy production requirement;
- a renewable portfolio standard;
- a feed-in tariff; and
- increased authority for full cost recovery for regulated utility production of renewable energy.

Government funding requires increased taxes or fees.

A change to the avoided cost standard, if it is to be meaningful, will have a significant ratepayer impact, the amount of which depends on the size of the customer base over which it is spread, and will risk a challenge that it violates the PURPA limitations. The FEECA approach will have comparable ratepayer impacts and raises questions as to whether it is the most effective and efficient approach to encouraging efficiency and conservation among ratepayers.

The only ways to limit the cost impact of either an RPS or a FIT and still encourage increased production are to limit the utility purchase requirement, such as to a limited percentage of annual revenues, and to establish either a tiered incentive or differentiated requirements based on the type of renewable energy used so that the incentive both encourages more-productive and less-expensive forms of renewable energy and limits the amount of money spent on solar.

These limitations would also work with increased authority for full cost recovery for regulated utility production of renewable energy, as would other limitations such as:

- requiring that the utility submit the project for competitive bid to ensure that it is the most cost-effective alternative;
- mechanisms to keep costs from increasing above the projected amount;
- limiting the amount of recovery of costs in excess of the provider's full avoided cost to no more than a specified percent such as one or two percent;
- alternative methods of requiring a blend of types of renewable resources, such as requiring that a specified amount of the total nameplate capacity for which a provider is permitted to recover costs in any calendar year be produced or purchased from renewable energy resources other than solar energy, or requiring that the total amount of the newly expanded amount of renewable energy be divided between solar and nonsolar forms of renewable energy;
- prohibiting cost recovery for any solar project that does not have a firm commitment for the production or purchase of an equal amount of nonsolar renewable energy;
- limiting the amount of cost recovery to a specified percent of the levelized cost of energy for a specified type of fossil fuel plant; and
- requiring that revenues derived from any renewable energy credit, carbon credit, or other mechanism that attributes value to the production of renewable energy that is received by a provider by virtue of the production or purchase of renewable energy for which this cost recovery is approved be shared with the provider's ratepayers such that the ratepayers are credited at least a specified percentage of such revenues.

There are potential incentives with little or no immediate ratepayer cost impact, including:

- voluntary green energy programs;
- limited retail sales by renewable energy producers; and
- regulated utility sales outside the regulatory process.

The last two incentives, however, will have intermediate and long term consequences as production outside the regulatory process reaches significant levels and creates issues such as redundancy of generating facilities and payment of embedded costs. These potential incentives would have to be designed and implemented very carefully, preferably in the context of a broad system of resource planning and replacement.

There are three potential funding sources to use to pay a portion of the costs of renewable energy projects:

- a public benefits fund;
- a local government program such as a municipal special assessment; and
- creation of a REC without an RPS requirement.

The amount of revenue that might be obtained through the REC alternative is speculative, and the authority for a local government program specific as to renewable energy projects is likely of limited use. As such, the most broadly effective alternative would be a public benefits fund, funded by fees, taxes, or both. A public benefits fund could be used to pay all or a portion of the costs of renewable energy projects, and could be made available to both public utilities and non-utility renewable energy producers. It would, however, have to be funded either through taxes or fees or through a surcharge on electricity bills.