



The Florida Senate

Interim Project Report 2004-118

November 2003

Committee on Communication and Public Utilities

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RENEWABLE ENERGY

SUMMARY

In the past few sessions there has been draft legislation requiring renewable energy generation in Florida. There have been concerns about such a requirement based on the increase in cost to utilities' ratepayers. This project was an attempt to bring the interested parties together and address the economic issue.

Staff met with persons representing the various interests in this project, developed information from other states with renewable energy requirements, asked staff of the Public Service Commission for assistance in developing data and projections on energy requirements and costs, and developed a list of policy issues to be considered in developing or analyzing proposals on renewable energy requirements.

Staff developed two proposals, a minimum renewable energy requirement and a renewable generation contract administered by the Public Service Commission, making specific recommendations on both. The contract approach is recommended as it is more likely to encourage renewable generation in Florida, to produce more certainty in implementation, and to result in less cost to ratepayers.

BACKGROUND

In the 2000 Regular Session, a bill was introduced to create the Energy 2020 Study Commission, Senate Bill 2020. The bill did not pass but was used by the Governor as a model for Executive Order 00-127, which created the Florida Energy 2020 Study Commission. Both measures directed the Study Commission to determine what Florida's electric energy needs will be over the next 20 years and how best to supply those needs in an efficient, affordable, and reliable manner that will ensure adequate electric reserves. In making these determinations, the Study Commission was to consider all relevant topics, including renewable energy.

The Study Commission issued its report in December of 2001. The report recommended that:

- The Florida Public Service Commission (PSC) conduct a study to identify the current level of renewable energy and prescribe a cost-effective level of new resources.
- The PSC have the authority to require that a portion of utilities' resources be from renewable sources available within Florida, including solar, biomass, and waste-to-energy.
- The PSC continue to encourage utilities to offer or expand "green pricing" programs.¹

The report noted that most renewable technologies are not yet cost-competitive with traditional forms of electric generation. It also noted that, for Florida, only solar energy and biomass fuels are currently viable or offer the possibility of providing meaningful amounts of electricity in the near term. The report went on to say that both types of solar energy, water heating and photovoltaics, are limited in their application due to economics. Solar water heating has high initial equipment cost and relatively long payback periods. Photovoltaics has a cost of 22 cents per kilowatt-hour (KWH). The average cost for traditional generation is 7.1 cents per KWH.

The report also noted that Florida already has approximately 362 megawatts (MW) of committed capacity from municipal solid waste generators under contract with utilities.

In the 2002 Regular Session, Senate Bill 1142 was at one time amended to create the "Florida Renewable Energy Purchase Act." The amendment:

- established legislative findings that a program requiring public utilities to use renewable energy would encourage investments in renewable energy resources, would stimulate

¹ Florida ... Energywise! A Strategy for Florida's Energy Future, Florida Energy 2020 Study Commission, page 101.

in-state economic growth, and would enhance the continued diversification of the state's energy resources;

- defined the terms “biomass,” “green energy” and “renewable energy”; and
- 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. They were replaced with a requirement that the PSC and the Department of Environmental Protection (DEP) 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. For purposes of the study, “biomass” was defined to mean “a power source that is comprised of, but not limited to, combustible residues or gasses from forest products manufacturing, agricultural and orchard crops, waste products from livestock and poultry operations and food processing, urban wood waste, municipal solid waste, municipal liquid waste treatment operations, and landfill gas” and “renewable energy” was defined to mean “electricity generated from any method or process that uses one or more of the following sources of energy, but not limited to: biomass; municipal solid waste; geothermal energy; solar energy; wind energy; wood waste; ocean thermal gradient power; hydroelectric power; landfill gas; and agricultural products and by-products.”

The joint PSC/DEP renewable energy report was filed in January of 2003. Included in the report were the following findings.

- There is no nationally accepted definition of renewable energy.
- Using the definition of renewable energy in the bill, and including waste heat under the “but not limited to” language, Florida has approximately 680 MW of renewable capacity.
- For the year 2000, this was approximately 3 percent of Florida's total capacity. By 2001, the percentage dropped to approximately 2 percent of total capacity. This was because the level of renewable generation remained constant while total net generation increased. Most of this renewable generation came from municipal solid waste, biomass fuel, and waste heat recovered from industrial manufacturing processes.
- Renewable energy technologies vary in technical readiness and cost. In terms of technical readiness, municipal solid waste and

biomass fuels offer the most feasible near term options for expanding the deployment of renewable energy in Florida. As to cost, electricity produced from renewable technologies is usually more expensive than that produced by traditional technologies. Within a given technology, cost can vary significantly from one project to another due to detailed engineering analyses, siting issues, transmission impact analyses, interconnection costs, and many other variables. The more economically feasible renewable technologies are municipal solid waste, biomass, landfill gas, and waste heat.

- Almost all of the existing renewable generation in Florida was constructed as a result of the federal Public Utilities Regulatory Policy Act, which requires utilities to purchase energy from certain qualified facilities at the utility's cost of building and operating its own generation, the avoided cost standard. With the lower costs of construction and operation of combined cycle technology, the payment to qualified facilities is now lower than when the PURPA first became law. As such, it is unlikely that very many new renewable facilities will be constructed based on current avoided cost payment levels.²

In the 2003 Regular Session two amendments relating to renewable energy were filed. One of these amendments defined “biomass,” “green energy,” and “renewable energy.”³ This amendment was adopted during the April 14, 2003, Communication and Public Utilities Committee meeting, but was subsequently removed from the bill during floor debate. The other amendment required all electric utilities to provide a minimum amount of 4 percent renewable energy by 2008 and each year thereafter, authorized the PSC to create a credit trading program, and contained provisions to make it easier to build or expand waste to energy facilities.⁴ During a meeting between committee staff and interested parties, concerns were raised over potential cost increases to ratepayers as a result of the amendment. The sponsor of the amendment announced at the meeting that he was requesting further study of this issue and did not take up the bill.

² *An Assessment of Renewable Electric Generating Technologies for Florida*, Florida Public Service Commission and the Department of Environmental Protection, January 2003, pages 1-3.

³ s2338.cu21.0x to 2003 SB2338

⁴ s1076.cu21.0b to 2003 SB1076

Subsequently, the Senate President approved this interim project to work with interested parties to overcome the economic hurdle associated with the higher cost of renewable energy and further develop a bill to establish a requirement for renewable energy and to provide for implementation of that requirement.

METHODOLOGY

Staff met with representatives from the municipal solid waste industry, the phosphate and chemicals industries, biomass generators, developers and marketers of renewable energy, the investor-owned electric utilities, the municipal electric utilities, the cooperative electric utilities, the Public Service Commission, the Department of Environmental Protection, and other interested parties. Staff also invited any interested person to submit any information, suggestions, or proposals by any means of communication.

FINDINGS

A. Input from interested parties

All discussions of how to require renewable energy turn on costs of generation. As noted in both of the reports discussed above, renewable energy generation is usually more expensive than traditional methods and usually is not cost-competitive. The difficulty with enacting a renewable energy requirement is resolving the issue of who would bear these additional costs. Renewable energy generators continued to say that they need higher prices than the cost-avoided cogeneration prices to increase the amount of renewable generation while utilities continued to object that their customers should not bear the increased cost of the more expensive generation.

When staff met with interested parties, there were four suggestions as to how to resolve the issue of the increased costs. The first was to encourage renewable generation instead of requiring it. Both municipal utilities and investor-owned utilities favor an approach that allows electric customers to volunteer to pay the additional costs of renewable energy as this would avoid a general increase in retail rates. This approach is typically implemented through a utility program allowing customers to volunteer to pay an additional amount each month toward renewable energy and using this additional money to buy Green-e Transferable Renewable Energy Certificates (TREC) from renewable energy generators in other states, perhaps as far away as Oregon or Washington. The utility does not buy the associated renewable energy itself; this energy is sold separately by the renewable

generator and the Florida utility continues to provide energy to the customer. The renewable generators raised concerns about this.

The second suggestion was to increase the price that utilities pay to renewable energy generators (although not expressly stated, it appeared that the intent was that a Florida TREC would be created and sold at a demand-based market price) and pass on the additional costs to ratepayers. The argument is that the additional cost to ratepayers will be offset indirectly in the form of general benefits such as improvements in health and environmental impacts, job creation and economic stimulus, and improvements in electric supply reliability and dampening of fuel price increases. This assumes that most if not all of the renewable generation bought by the utilities is generated in Florida and that Florida renewable generators can produce all the renewable energy necessary to meet a statutory requirement. The utilities voiced their concern regarding this suggestion.

The third suggestion was to somehow provide tax incentives for the renewable energy generators in an amount sufficient to allow them to profitably increase generation while still selling at avoided cost. No specific suggestions were made. There are several problems with this. First, renewable generators use a variety of fuels and technologies, and each faces different economic hurdles in profitably increasing generation, so the amount, and potentially the type, of the required incentive varies from generator to generator. Second, it would be extremely difficult to draft these tax incentive statutes so that each generator received exactly the amount of money necessary to support its operations, without any shortfall or windfalls. Finally, providing tax breaks may need additional consideration to identify all associated costs and benefits.

The fourth suggestion was to somehow establish some economic incentive for the utilities. The only specific suggestion was allowing the utilities to accelerate depreciation. Again, it is difficult to establish a nexus between the amount of the required incentive and the amount and the process for accelerated depreciation so as to avoid shortfalls or windfalls.

B. Other information

Given the positions of the parties and the inability to come to a consensus on a method of dealing with the economic issue, staff developed the information below to help the Committee in developing or assessing

renewable energy legislation.

1. Renewable energy requirement laws in other states

Staff reviewed laws in 13 other states that establish a renewable energy requirement, frequently called a renewable portfolio standard (RPS). Nine of these states adopted an RPS as a part of deregulation. The likely reason for coupling deregulation with an RPS requirement is that the price decreases deregulation is expected to achieve would offset the price increases expected from the RPS requirement.

Although there is great variety among the states in terms of the level of renewable energy required,⁵ some other provisions are similar. The renewable energy requirement typically applies only to competitive electricity suppliers or investor owned utilities, not to non-competitive municipal utilities or cooperatives. The increase in costs of renewable energy generation over traditional generation is typically recovered in the retail utilities' rates. The renewable electricity typically must be generated within the state or be delivered to the state, in some instances, such as Texas, Nevada, and California, delivered by a transmission line solely or largely dedicated to renewable energy.⁶

2. Policy issues

Staff developed the following list of policy issues that should be considered in developing a renewable energy bill.

1. Should the bill be voluntary or mandatory?
2. What should the required/encouraged percentage of renewable energy be?
3. Should the provisions of the bill be phased in?
4. What utilities should the bill apply to?
5. What types of fuels and technologies should be included in the definition of "renewable energy"?
6. Should there be any standards on the utilities' generation or procurement of renewable energy, such as that it be prudent or least cost?
7. Should the utilities be able to satisfy the requirement by purchase of renewable energy or renewable energy credits from out-of-state generation?
8. Should purchase of Green-e tradable renewable energy certificates be allowed as a means of satisfying the renewable energy percentage requirement? (These certificates are always sold separately from the underlying energy.)
9. If utilities are allowed to purchase energy credits or Green-e certificates, should there be a requirement that the underlying renewable energy be purchased and transmitted into the state? Should there be a requirement that the amount of energy represented by the credit or certificate be transmitted into the state, without a requirement that it be verifiable as renewable energy?
10. If utilities are allowed to purchase energy credits or certificates without the underlying energy from out-of-state generators, should there be a separation of the in-state renewable energy and a tradable energy credit into two separate commodities? If so, what happens with the existing generation, much of which is sold under long term contracts? Does the generator have a separate energy credit to sell?
11. If there is a renewable energy certificate trading system, should development of the details of that system be delegated to the PSC?
12. Who should bear the burden of the additional costs? If it is ratepayers, how should this cost be recovered?
13. What enforcement mechanism or penalty should be used?

3. Economic information

Although economic considerations are arguably more relevant to the initial issue of whether to enact a renewable energy requirement, which was not the focus of this project, they are relevant to evaluating the impacts of some alternative proposals. As such, committee staff asked PSC staff for assistance in developing data and projections on energy requirements and costs.

Committee staff asked the PSC staff to extract projected total future energy need data from PSC records and use this to make estimates as to the percentage of renewable energy as a part of the total energy generation. First PSC staff estimated the percentage of total current generation that is made up

⁵ The amount of renewable energy required in these states ranges from 1 percent to 30 percent, although Maine's 30 percent requirement was met before it was enacted, so it is unlikely to encourage any new renewable generation.

⁶ This raises the issue of a possible violation of the commerce clause. There is an administrative case in Nevada involving this issue. Nevada Public Utility Commission Docket No. 03-8002.

of renewable energy.⁷ The most recent data on actual production shows that in 2001 Florida utilities purchased about 3,328,000 megawatt-hours (MWH) of energy from renewable sources. There is no evidence the amount of renewable energy changed significantly for 2002. In 2002, the state total net energy for load (i.e. total electric energy consumed in Florida) was 222,642,000 MWH. Renewable energy is then 1.47 percent of total energy produced and consumed.

PSC staff also estimated the amount of renewable energy that would be needed to satisfy a requirement that renewable energy make up 3 percent or 4 percent of total generation. They assumed that the current 3,328,000 MWH of energy from renewable sources would continue to count toward the total goal and calculated the additional amount needed to meet each percentage level for each year's net energy to load (NEL) as that number increases each year. The result is the following chart.⁸

Year	NEL (000 MWH)	3 % (000 MWH)	4% (000 MWH)
2003	226,610	3,470	5,736
2004	233,500	3,677	6,012
2005	240,000	3,872	6,72
2006	246,819	4,076	6,544
2007	252,710	4,253	6,780
2008	259,074	4,444	7,034
2009	264,747	4,614	7,261
2010	271,088	4,808	7,515
2011	277,408	4,994	7,768
2012	283,830	5,186	8,025

⁷ The data in the joint PSC/DEP report on the amount of renewable energy in Florida was expressed in terms of numbers of megawatts of capacity. This measures the amount of capacity that is available for generation. The measure used for how much energy was actually generated is megawatt-hours.

⁸ This chart can be read as follows. For 2003, the total retail demand and generation is projected to be 226,610,000 MWH. Three percent of this would be 6,798,300 MWH. Subtracting the current 3,328,000 MWH of energy from renewable sources, the increase necessary to meet a 3 percent requirement is an additional 3,470,000 MWH of renewable energy generation.

Committee staff also asked PSC staff for assistance in assessing renewable energy credit (REC) markets in other states and in determining average market prices for these credits in these markets. PSC staff found that the data on the robustness of the renewable energy credit market and price of credits in these markets would be sketchy at best in most states because the programs were established so recently. The best information PSC staff found indicates that at current trading levels, the price of tradable credits ranges between \$3 up to \$300 per MWH (i.e. \$0.003 to \$0.30 per KWH). The price depends on what underlying energy source is being used to create the energy represented by the REC. PSC staff stated that, at this time, the REC market appears to be small with respect to volumes and number of transactions, so caution is necessary in scaling up these estimates for large purchases of credits under long term contracts.

PSC staff also noted that geographic restrictions on the area from which Florida utilities would be permitted to buy credits would significantly affect delivered cost to Florida. They found that the evidence suggests the southeast region does not have adequate renewable resources to provide a robust, transparent market for RECs. Anecdotal evidence suggests that with the growth in installed wind generation in the Midwest and in western states, sizeable numbers of wind RECs could be available in the future. At this time, approximately 6,100 MW of wind capacity is available. Assuming a 35 percent capacity factor, the actual annual energy production would be about 18,700,000 MWH. A 2004 3 percent standard would require Florida to purchase 18 percent of all the wind produced in the country. A 4 percent standard would require the purchase of 32 percent of all the wind energy produced in the country.

Using this information, PSC staff produced the following table, which indicates the cost for achieving a 3 percent and a 4 percent RPS standard solely by purchase of credits from out-of-state generation. They assumed an average cost per REC of \$10. Depending on the underlying energy source and the scope of the geographic area in which credits are allowed to be purchased, the actual costs could be higher or lower.

Year	3 % (millions \$)	4% (millions \$)
2003	\$34.70	\$57.36
2004	36.77	60.12
2005	38.72	62.72
2006	40.76	65.44
2007	42.53	67.80
2008	\$44.44	\$70.35
2009	46.14	72.61
2010	48.08	75.15
2011	49.94	77.68
2012	51.86	80.25

C. Analysis of information

Two approaches could be taken to develop a renewable energy statute, an RPS approach or a PSC-administered Renewable Generation Contract. As any RPS statute is more complex, this approach is discussed in more detail.

1. The RPS approach⁹

The starting point in the analysis of a potential RPS is Florida's current level of renewable energy generation, 1.47 percent of the total energy generated, and the fact that both of the reports discussed above found that Florida's resources for renewable generation are limited. Given this, the definition of renewable energy should be expansive to include all possible sources of in-state generation.

To simplify implementation, the requirement should apply only to "new sources of renewable energy," with this term defined as new source of renewable generation or a new contract for an existing source of generation. Existing renewable energy currently sold under existing contracts would not be available to meet the requirement. However, all existing sources would become new sources as these existing contracts end and new contracts are entered into.

⁹ While staff believes that given the circumstances cited in this report that a PSC-administered Renewable Generation contract may be a better alternative for Florida should the committee consider the RPS approach, then staff's suggestions should also be considered.

There are two alternative treatments for the requirement. First, it could be phased in, perhaps 0.5 percent in 2004 with .5 percent increases each year until a specified goal, perhaps 4 percent of total retail generation in new renewable energy, is reached. This implementation schedule would take until the end of 2011. Second, the requirement could be stated as an ultimate goal amount at the end of a period of time, for example 4 percent at the end of 2011.

Either way, there is another consideration. With the requirement stated as a set percentage of total retail generation, and with the amount of total retail generation increasing each year, the amount of renewable energy needed to meet the requirement automatically increases irrespective of any change to the percentage number. To avoid this increase, and to provide certainty as to the ultimate amount of renewable energy, the percentages could be stated as percentages of 2002 net energy to load, not as a percentage of the ever increasing amount of net energy to load each year.

As to the increased cost of generation, the general suggestions of tax incentives or other economic incentives are certain to result in shortfalls or windfalls. Passing the increased cost on to the ratepayers is the most direct and certain method of cost recovery. Costs should be passed on without differentiation between customer classes. Cost recovery would be administered by the PSC, which would select the appropriate cost recovery clause mechanism to use.

The utilities should be required to generate or purchase the renewable energy through the least cost alternative available, with costs being prudent and reasonably incurred. There should be a required preference for Florida generation, all things being equal. The utilities should be allowed to purchase renewable energy or renewable energy credits or certificates from out of state only if this is the least cost alternative. This keeps the price for renewable energy or certificates at a market price level, although the market is just beginning to develop and although there is some question as to whether the renewable resources available in Florida can be economically competitive with wind or hydro generation in other states.

The utilities should be allowed to purchase either renewable energy or renewable energy credits/certificates from other states. Although the vast majority of states with an RPS requirement have established an in-state generation requirement, it is

subject to challenge that it violates the commerce clause of the U.S. Constitution. Also, if the Legislature were to establish a requirement that the utilities generate or purchase a set amount of renewable energy, it should be reasonably certain that it is possible for the utilities to do so. For example, Florida renewable generators may not be able to produce enough renewable energy to satisfy the requirement, or at times may not be able to timely do so. The joint PSC/DEP report on renewable energy said that it was feasible that there could be an additional 650 MW of renewable energy in Florida in the near future. When asked how many MWH this capacity could produce, PSC staff estimated that it would reasonably be about 2,106,000 MWH, including municipal solid waste and waste heat. Adding this to existing generation of 3,328,000 MWH gives a total of 5,434,000 MWH of Florida generated renewable energy, not enough to meet a 4 percent requirement even at 2003 total retail numbers, let alone as far in the future as the 2011 deadline discussed above if that percentage is not limited to 2002 net energy to load. The availability of renewable energy itself from other states is also unknown, and, if Florida utilities are required to import this energy, the transmission or wheeling fees could double the delivered price. As such, the utilities should be allowed to satisfy the requirement through the purchase of renewable energy certificates without purchasing the underlying energy.

Renewable energy from new sources in Florida would be divided into two commodities, the energy, likely sold to the utilities at cogenerator avoided cost prices, and a renewable energy certificate, sold at or below the least cost price of out-of-state generation.

As the investor owned utilities are best equipped to fulfill a renewable energy requirement, and as they are the only utilities for which the contemplated cost recovery mechanism will work, Florida should consider following the lead of most of the states that have enacted an RPS requirement and exempt municipal utilities and cooperatives.

The RPS requirement should be enforced through the PSC's general enforcement authority under section 366.095, F.S. This section authorizes the PSC to impose upon any entity subject to its jurisdiction under the public utilities chapter that is found to have refused to comply with or to have willfully violated any lawful rule or order of the commission or any provision of the chapter a penalty for each offense of not more than \$5,000, which penalty shall be fixed, imposed, and collected by the PSC. Each day that the refusal or

violation continues constitutes a separate offense. Each penalty is a lien upon the real and personal property of the entity, enforceable by the commission as a statutory lien under chapter 85, F.S.

While an RPS requirement as described above would be the most workable plan for such an approach, it is still not without concern. The impact of any renewable energy requirement is uncertain as there are too many variables. For example, it is unknown how much more in-state generation renewable energy will become economically feasible, what type of fuel or technology will become feasible, how long it will take for this generation to come on line, or how high a price will be needed to make it profitable. The availability of energy or certificates from out-of-state generators and the price to purchase it is also unknown.

Assuming that the above recommendations become law and that there is a \$10 per MWH market price for renewable energy credits in developing markets in other states, this becomes the price to beat for Florida renewable generators. Using the annual incremental cost estimate for a 3 percent RPS of \$34.7 million (2003), a typical residential customer would pay an additional 15 cents per month on a 1,000 KWH bill. Using the annual incremental cost estimate for a 4 percent RPS of \$57.36 million (2003), a typical residential customer would pay an additional 25 cents per month. While these cost estimates provide some guidance, it would be misleading to rely on them to demonstrate the total cost impact on all rate payers. The estimates do not reflect cost to commercial or industrial rate payers. Additionally, the cost to utilities to purchase the renewable energy may be higher than assumed. Also, these costs may increase if additional states establish renewable energy requirements, resulting in increased demand.

2. The PSC-administered Renewable Generation Contract approach

As an alternative to the RPS approach, the Legislature could authorize the PSC to require public utilities to make a renewable generation contract available to renewable energy generators, with the Legislature defining what fuels or technologies qualify for these contracts. As above, this definition should be expansive to include all forms of production.

The contracts could provide for a payment in excess of the current statutory full avoided costs. They would provide for capacity and energy payments based on the costs for a public utility to construct and operate a

facility that would provide for fuel diversity and fuel cost stabilization. It is likely that for the foreseeable future, payments would be based on coal instead of natural gas, as they are now. This would be a slightly higher payment, so it would encourage some increase in renewable generation but would minimize the impact to ratepayers. Prudent and reasonable costs would be recovered from ratepayers.

The PSC would establish the standards relating to the terms, condition, and payment schedules. The PSC would report to the Legislature at the end of a 5 year period on the amount of renewable energy that has been developed in Florida and with an estimate of the economic impacts of this development on the state.

RECOMMENDATIONS

The contract approach is more likely to encourage renewable generation in Florida, to produce more certainty in implementation, and to result in less cost to rate payers. As such, the Legislature should consider authorizing these contracts. If the Legislature chooses instead to enact an RPS statute, it should follow the recommendations set forth above.