

2006 PURC ENERGY POLICY ROUNDTABLE
Understanding Fuel Diversity Trade-Offs and
Risks: Making Decisions for the Future



Public Utility Research Center

“Leadership in Infrastructure Policy”

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Purpose of the Meeting

On Tuesday, October 31, 2006, the University of Florida Public Utility Research Center (PURC) sponsored a meeting in Tallahassee for the Florida Public Service Commission (FPSC), legislators and legislative staff, other government officials, consultants, academicians, and the electric utility industry to discuss the types of strategies involved in planning for Florida's long-term energy needs. This meeting used the Aspen Institute model of group discussions interspersed with formal presentations to set the context for those discussions. The meeting featured five presenters whose remarks informed the facilitated discussions of three break-out groups that met in the morning and afternoon. Each discussion group was asked to: develop a future supply portfolio for Florida in 2015, including a mix of capacity expansions and energy demand strategies; identify uncertainties for implementing the portfolio; and suggest risk mitigation strategies. The collective observations of each group were shared during the final session of the meeting. The meeting agenda is Appendix I.

Summary of Presentation Highlights

In his welcoming remarks, Tallahassee Mayor John Marks provided an example of how a city can collaborate in a creative manner to share the financial risk of a large base load generating facility. Population trends and energy demand determine the timing for capacity additions, and an overview by Dr. Tim Chapin, Florida State University, outlined historic and projected population trends in Florida. The electric utilities are statutorily required to submit their ten-year site plans to the FPSC, taking into account projected demand in summer and winter. For its part, the FPSC is required to perform a preliminary study of each plan to determine whether it is "suitable" or "unsuitable." These plans are the roadmaps for Florida electric utilities' future capacity, and a brief analysis of these plans, taken in aggregate, was provided by Mr. Michael Haff, FPSC.

Mr. Joel Bluestein, Energy and Environmental Analysis, Inc., furnished the bigger picture of historic and projected plant construction in the nation and explained the impact of various environmental requirements on existing and new generating plants and the implications of those requirements for fuel diversity. On the supply reduction side, the potential for deferring construction of more costly generation plants might be realized by demand-side management (DSM) programs and energy conservation strategies.

Mr. Mark Spiller, MACTEC Engineering and Consulting, Inc., reviewed the implications of these strategies for meeting projected demand in Florida. One method of reducing peak demand and shifting customer load to lower-priced energy is through real-time pricing (RTP) or time-of-use pricing (TOUP) schemes. Southern Company implemented RTP and TOUP schemes beginning in the early 1990s. Gulf Power Company, a company under the Southern Company umbrella, offers customers a TOUP program called the GoodCents Select Program. Mr. Jim Thompson, Gulf Power Company, explained the features, benefits, and load impacts of both Southern Company's aggregate RTP and TOUP efforts and Gulf Power's RTP GoodCents Select Program. All speaker presentations may be accessed at www.purc.ufl.edu.

The Honorable John Marks
Mayor of Tallahassee



The mayor greeted participants and outlined the developments that led to Tallahassee joining a consortium of three other utilities: JEA, Reedy Creek Improvement District, and the Florida Municipal Power Agency to construct the Taylor Energy Center. The Center will be an 800 MW coal plant located near Perry, Florida that is scheduled to begin operation in 2012. The City of Tallahassee generates its own power and made a conscious decision in 1990 to rely almost exclusively on natural gas. So the coal plant will add diversity to its existing fuel mix and also accommodate projected population growth in the region. The plant is expected to cost \$1.5 billion.

Dr. Tim Chapin
*Associate Professor, Department of Urban and Regional Planning,
 Center for Demography & Population Health, Florida State University*



Dr. Chapin provided an overview of Florida’s past and projected population trends. According to the 2000 Census, Florida had almost 16 million residents. During the 1990s, Florida added over 3 million new residents, approximately a 23.5% increase. The same growth pattern is projected per decade for the foreseeable future. Assuming other factors remain constant, residential power demand is projected to increase by 31% by 2015. Florida’s employment growth is also projected to grow by over 1.5 million new jobs. Assuming other factors remain constant, power demand related to employment is projected to increase by almost 19%.

Growth trends will not be uniform throughout the state. There will be less growth in Southeast Florida and more throughout the peninsula, suburban counties outside of Orlando, and the counties in the Panhandle (Walton, Oskaloosa, Leon, and Wakulla).

Table 1: Florida Population Growth, 2000-2015

Florida Population Growth				
	2000	2005	2010	2015
Low Series	15,982,378	17,322,000	18,338,200	19,390,300
% Change		8.4%	14.7%	21.3%
Med. Series	15,982,378	17,760,000	19,397,400	21,000,800
% Change		11.1%	21.4%	31.4%
High Series	15,982,378	17,892,100	19,949,500	22,029,900
% Change		11.9%	24.8%	37.8%

Source: Bureau of Economic and Business Research, the University of Florida

Mr. Michael Haff
Senior Engineering Specialist, FPSC



Mr. Haff explained the factors affecting Florida utilities' plans for adding capacity, provided projections for fuel supply based on electric utility ten-year site plans that are filed with and analyzed by the FPSC, described FPSC actions to encourage fuel diversity, and identified actions that utilities might take in the future to promote fuel diversity. The greatest factor in determining *the type* of new generating unit is the fuel price forecast. In Florida, gas price forecasts have been historically vastly understated. Reliance on inaccurate projections causes risk. One way to mitigate risk is to take a balanced fuel supply approach which reduces exposure to the fuel price volatility of natural gas. The greatest factor in determining *the timing* of new units and another potential source of risk is demand and energy forecasting which has historically been accurate (less than 1% error in estimates) but might not necessarily be in future years.

Between 1990 and 2005, most of the new generating capacity constructed in Florida relied on natural gas-fired generation, but there are plans under way to add more capacity from coal-fired plants and plants that use other fuel sources. For example, TECO is planning a 630 MW coal-fired Integrated Gasification Combined Cycle (IGCC) facility, and FPL and Progress Energy Florida (PEF) are evaluating nuclear options. The FPSC recently approved a contract for PEF to purchase energy from a biomass energy provider following construction of a 116 MW facility near Lake Okeechobee. Other actions to promote greater fuel diversity and less dependence on natural gas include: a greater use of renewable resources and cost-effective DSM programs; assessment of potential plant sites for coal generation; more joint ownership of coal-fired units to reduce cost impact, like the Taylor Energy Center; an investigation of financial assistance from the Department of Energy (used for Orlando Utilities Commission (OUC) to construct an IGCC facility at the Stanton Energy Center); and an investigation of different transportation modes to deliver coal, alternative pipelines to the two main ones in Florida, FGT and Gulfstream, and possible greater use of supply from liquefied natural gas (LNG). Although they still have a way to go, Florida's electric utilities are making progress in moving toward a more balanced fuel supply mix.

Mr. Joel Bluestein
President, Energy and Environmental Analysis, Inc.



Mr. Bluestein provided an overview of fuel diversity trends in the nation and explained the impacts on generating fuel selections of the following: the Clean Air Interstate Rule (CAIR) to limit SO₂ and NO_x in the Eastern U.S., the Clean Air Mercury Rule (CAMR) to limit mercury emissions from coal plants, and New Source Review, a pre-construction permitting program to limit emissions. He also outlined various proposals in Congress and state activities on CO₂ reduction.

Since 1999, over 200 GW of new natural gas generation have been built, one-third of capacity coming from peaking plants. Power plant construction varies by region and new combined cycle plants have been replacing very old, less efficient plants. Florida led the nation in the largest increase in natural gas capacity since 1990. The number of proposals for new coal

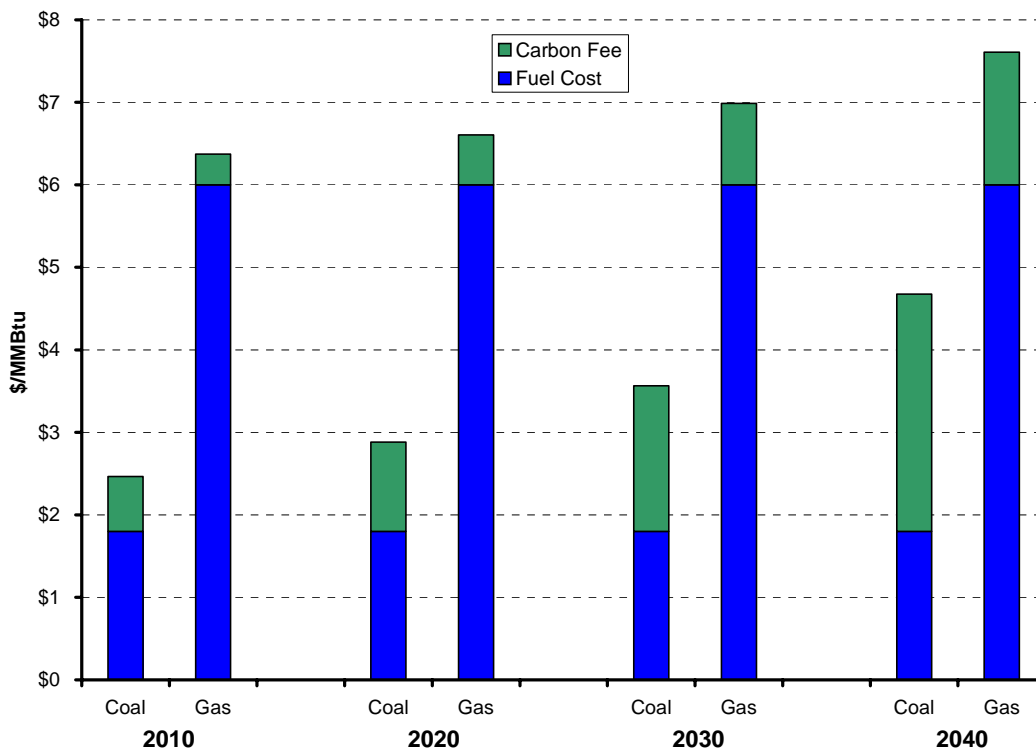
plants has increased in recent years driven by economic profitability in certain regions of the country, particularly in states which have not restructured. Driving the momentum to construct more coal plants is the tighter balance between natural gas supply and demand—a change from the 1990s when there was excess production capacity. To some extent, natural gas imports from Canada and expanded supply from LNG have reduced supply pressures. Nonetheless, this trend of tight supply and demand is expected to continue.

The impact of compliance with environmental policy affects plants differently, depending on their fuel source and whether they are existing or new.

- *CAIR and CAMR* will primarily affect existing plants and EPA projects low cost and little effect on existing plants. Although both programs allow the use of cap-and-trade schemes and almost all states use that scheme to comply with CAIR, many states have indicated more interest in curbing emissions on an individual plant basis to comply with CAMR. Projections to 2020 also suggest that the energy supply mix is not likely to be affected by CAIR, which will become fully effective in 2015, and by CAMR, which will become fully effective in 2018. The greatest uncertainty with CAMR implementation is the performance of mercury control equipment.
- *New Source Review* affects existing and new plants differently. Existing plants are affected because of the uncertain disposition of enforcement actions currently under litigation. Electric utilities contemplating new coal plant facilities are faced with the uncertainty of whether IGCC technology must be considered under the Best Available Control Technology (BACT) standards from new sources.

There is no national policy on reduction of CO₂ emissions, but state (California, Oregon, Washington, and Massachusetts) or regional efforts such as the Regional Greenhouse Gas Initiative (RGGI) in the Northeast and Mid-Atlantic regions are under way. A mandatory nationwide mitigation plan for CO₂ is expected to occur within five years. The impacts of the plan are likely to be as follows: gradual, economy-wide, market-based, technology-driven, linked to international progress, and non-threatening politically and economically. Even if a carbon fee is imposed, the economics underpinning fuel mix selections is not likely to change much: the price of natural gas is still likely to be more expensive than coal.

Figure 1: Coal and Gas Prices, 2010-2040



In Figure 1, even with the imposition of the carbon fee (the bar segment in green), fuel price economics is likely to favor coal until 2040. However, the long-term implications for coal plant construction remain uncertain without a national resolution for carbon policy. A greater issue than uncertain CO₂ policy implications may be citizen opposition to the construction of new coal plants.

Mr. Mark Spiller

Principal, Energy Engineering Group, MACTEC Engineering and Consulting, Inc.



Mr. Spiller explained the statutory authorization for and administrative rules governing Florida’s DSM program. Florida’s electric utilities with annual sales to retail customers of over 2,000 GWH are subject to the Florida Energy Efficiency and Conservation Act (FEECA), which requires utilities to submit DSM plans to meet goals set by the FPSC. The cost-effectiveness of the utilities’ plans are determined by the Rate Impact Measure (RIM) test which compares the cost of the DSM program, including reduced utility revenues, to the benefits of avoided costs of new plant construction and operation. All measures deemed cost-effective under the RIM test may be recovered in rates. Because natural gas generation has lower capital costs relative to generation from other fuel sources, combined with relatively low natural gas prices, the cost-effectiveness of DSM in Florida has declined in the past 15 years. However, with increasing natural gas prices pushing utilities to build new plants using solid fuels in future years, the cost-effectiveness calculus for DSM is likely to become more favorable. The greatest

“weakness” of the RIM test from a DSM and efficiency perspective is that it requires no ratepayers to experience a rate increase, even those who are not participating in the DSM or efficiency program. Finally, the savings to utilities from DSM plans cannot keep up with the growth in demand.

Energy conservation appears to provide a significantly larger potential for reducing demand in a cost-effective manner. Incentives for investments in renewable energy are also providing opportunities for consumers and developers: tax credits authorized under the Energy Policy Act of 2005 (EPACT 2005) and rebates for the installation of residential and commercial solar photovoltaic electric systems and solar thermal systems, matching grants, and sales tax exemptions under the Florida Renewable Energy Technologies and Energy Efficiency Act (2006 Senate Bill 888). Biomass, in particular, shows great potential for additional capacity in the state because of the large supply of municipal solid waste and other unused waste materials.

Mr. Jim Thompson

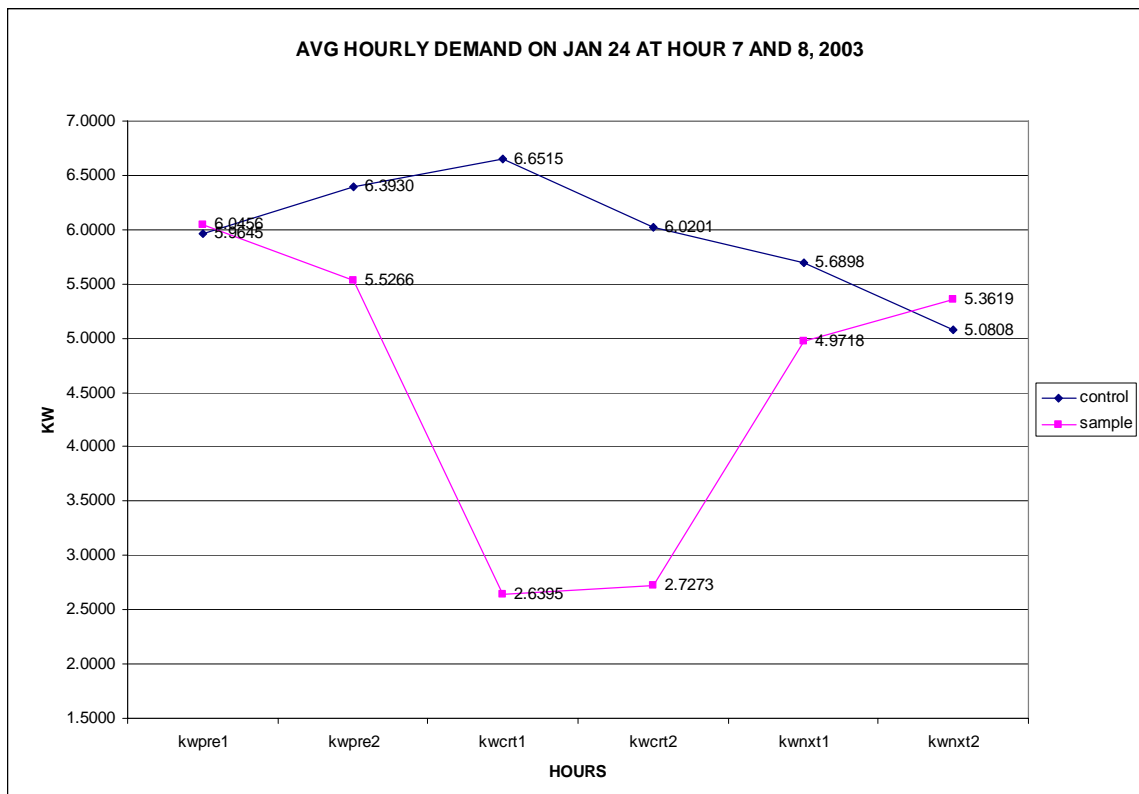
Team Leader, Pricing and Load Research, Gulf Power Company



Mr. Thompson outlined the features of RTP and TOUP programs offered by Southern Company. Programs varied among the constituent companies in terms of features. All shared the feature of shifting the risk to customers to reduce consumption in response to pricing signals with the expectation of saving money when prices are projected to increase. Conversely, consumers might decide to consume more energy when prices are expected to be lower. Gulf Power’s program has 7,755 participants. According to the company, customers’ satisfaction is high, and the churn rate is only 7%.

Customer bill savings are 15% annually. Peak demand reduction is greater in winter than in summer. Although there has been a shift in load to lower pricing during the year, there has been no discernible reduction in net energy use. Figure 2 reflects the lower demand at peak of participants in GoodCents compared to demand of the control group.

Figure 2: Peak Demand Reduction—Control Group Compared to Sample GoodCents Select Program Consumers, 7 a.m. and 8 a.m.



Synthesis of Group Discussions and Speaker Presentations

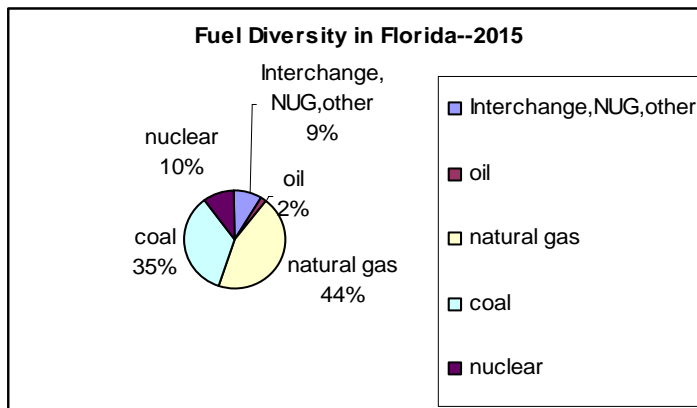
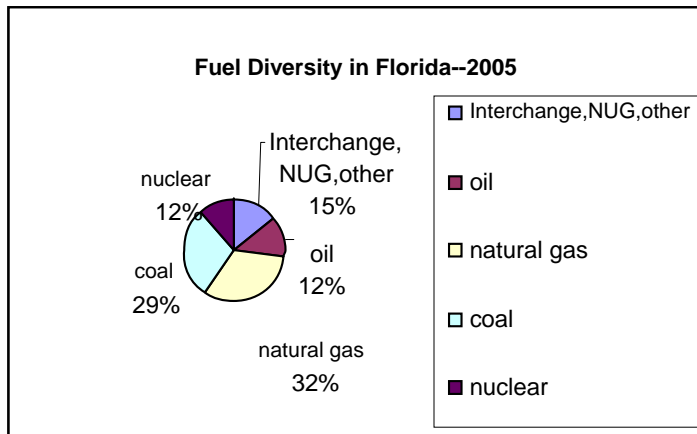
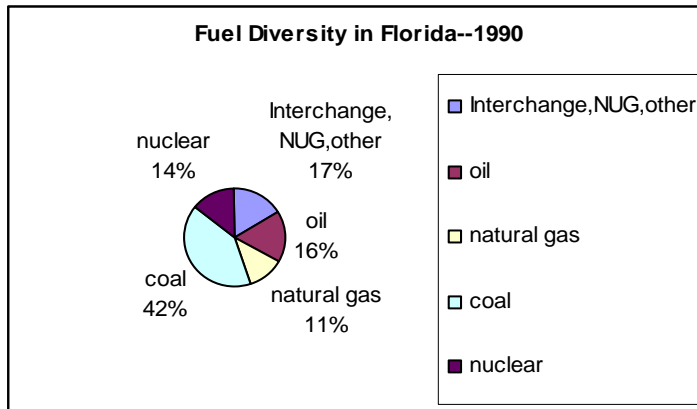
The overarching goal for the state’s energy policy, as one discussion group aptly stated, is to meet the energy needs of a growing population. According to estimates furnished by Dr. Chapin, Florida might have over 4 million more residents in 2015 than in 2005, if the highest population growth scenario materializes. (See Table 1.) Discussion group participants observed that an integrated approach is needed to meet that demand, including energy efficiency and DSM, new generation from various sources, and more capacity from transmission. Fuel diversity is important for reducing risk to both investors and consumers. As one participant noted, all capacity expansion and demand reduction strategies should be “on the table” for consideration because even if they may not be viable or economical now, they may be at a later date.

With the goal of meeting projected energy need and the importance of fuel diversity as a backdrop, existing federal and state policy is perhaps a good place to start in an analysis about what Florida’s strategies should be. One discussion group noted that federal policymakers in EPACT 2005 and Florida policymakers in 2006 SB 888 indicated some sort of priority for fuel selection through the various incentives offered in those pieces of legislation. Specifically, EPACT 2005 provides investment tax credits for first-mover IGCC projects and other advanced coal-based projects and production tax credits for first-mover nuclear plants, as well as other

incentives to encourage nuclear power plant construction. The federal Renewable Energy Production Incentive program also provides financial incentive payments for electricity sold and produced by renewable generating facilities. State incentives are provided to encourage movement away from investments in natural gas and oil-fired generation toward facilities using coal, nuclear, and renewable resources. In addition to providing incentives for greater use of renewable resources, 2006 SB 888 provides a streamlined siting process for Florida's generating plants, including nuclear power. Therefore, federal and state government policy could be characterized as pointing to the type of fuel mix preferred by government in future years: generation that is less dependent on natural gas and oil and the price volatility, production constraints, and supply reliability issues associated with them. And Florida's electric utilities are in fact moving toward a more balanced supply portfolio, as Mr. Haff, FPSC, indicated in his remarks.

Figure 3 is a set of pie charts based on aggregate ten-year site plans of Florida's utilities. Although natural gas continues to dominate, the proportion of coal relative to the total fuel mix is projected to increase from 2005 to 2015. Meanwhile, additional capacity from natural gas is also projected to increase during that time period. One reason for continued investment in natural gas plants, despite their drawbacks, is the long-lead times needed to construct coal plants (7 years on average) and nuclear facilities (10 years as an estimate). By 2015, the proportion of nuclear relative to the total supply mix is also expected to decline. But, as Mr. Haff indicated, several nuclear plant proposals are currently under consideration; that proportion could therefore increase after 2015.

Figure 3: Florida's Fuel Diversity in 1990, 2005, and 2015 (projected)



Source: Florida Public Service Commission

Despite the preference signals provided at the federal and state levels, discussion groups and speakers observed certain barriers that needed to be overcome and certain risks that required mitigation before greater progress could be made toward more investment in generation, transmission, and demand reduction strategies. Several policy concerns that affect selection of those strategies are listed below:

Cost-effectiveness and reliability issues – Natural gas, LNG, coal, and nuclear

There are always trade-offs in determining which energy supply or demand reduction strategies would be most cost-effective and reliable. The discussion groups considered these issues which are summarized below.

Natural gas-fired plants are typically less expensive to build than coal and nuclear plants and have lower operation and maintenance costs but have higher fuel costs driven by the price of natural gas relative to coal and nuclear fuel prices. Coal and nuclear plants are more expensive to build but their associated fuel costs are lower and their fuel prices have been historically much less volatile. As one discussion group observed, nuclear facilities in particular have very low fuel and operating costs. The availability of fuels is, of course, another factor affecting fuel cost and reliability. Natural gas is particularly prone to production and supply pressures and constraints. Disruptions caused by severe weather can affect such supplies.

One discussion group noted that LNG imports might be considered a viable alternative for domestically produced natural gas and could serve as a short-term backup or hedge, in particular when there are natural gas supply constraints:



LNG can be stored, and docking and storage facilities are on U.S. soil. However, LNG providers also face problems: the siting of terminals, international competition for the same supply, and transportation of the commodity. Like natural gas, LNG is subject to possible price volatility, is vulnerable to weather disruptions, and requires utilities to rely heavily on spot market contracts.

Costs associated with transporting fuel to power plants via pipelines, rail, or shipping all have specific problems related to the mode of transportation and contractual transport arrangements. Problems related to railroad contracts for coal transport, in particular, were noted. To improve reliability and reduce uncertainty in terms of fuel price, storage might be an option. For example, a utility might have a 30-day stockpile of coal near the plant, an option that is not viable for natural gas.

The groups acknowledged the federal and state incentives to reduce some of the costs and regulatory uncertainties associated with coal and nuclear plant construction. One group observed that despite these incentives, smaller utilities could not afford to construct large projects using those fuels. The tight supply of construction materials needed for large power plant construction and foreign competition for the same materials also was an impediment noted by two groups.

Options for mitigation. The discussion groups agreed that a diverse fuel portfolio would mitigate some of the uncertainty associated with fuel cost volatility and fuel reliability concerns.

The groups also concurred that all fuels should be considered, even natural gas because of the shorter lead time for constructing natural gas-fired plants. One group observed that hedging, short-term back-up with LNG, and maintaining excess reserves for generation could also help electric utilities improve reliability and be less vulnerable to fuel price volatility. Natural gas could be stored above ground and underground (not in Florida). One option for reducing construction costs of large facilities, a major barrier for smaller utilities, could be collaborative projects like the Taylor Energy Center described by Mayor Marks.

Technology issues— coal and nuclear power

Closely related to cost and reliability issues are technology issues that electric utilities face in planning for the construction of coal and nuclear generating facilities using advanced technologies. In particular, utilities must respond to investors' perceptions that these technologies pose some risk. Advanced technologies for nuclear power have been proven in the market but have not been constructed in the United States. The last plant to become commercially operational in the U.S. was the Tennessee Valley Authority's Watts Bar reactor in 1996. However, there is much research under way at the University of Florida and elsewhere on advanced reactor designs and on standardizing technologies which should eventually reduce costs and lower risk.

Discussion groups also focused on IGCC technologies for coal-fired plants which have the advantage of reducing emissions and making operations more efficient. The IGCC process emits as much CO₂ as the conventional coal-burning plant, but IGCC plants have the equipment



to capture the emissions and then inject, or sequester, them underground. Yet, the technologies for sequestration are largely untested and Florida lacks the proper geology for CO₂ injections: the CO₂ must be stored deep underground in depleted oil and gas fields or in saline formations.

As one participant stated, "IGCC is not commercially ready for prime-time." There are no integrated vendor packages for IGCC, thus making these projects risky investments. Moreover, these facilities are still heavily subsidized, and their operations are complicated. Nonetheless, federal and state policies clearly support consideration of IGCC, other advanced coal, and advanced nuclear technologies as options for providing expanded capacity with less environmental impact than traditional coal-fired technologies. Some countries have standardized their nuclear technology. A prime example is France which generated 78.5% of its power from nuclear energy.

Incentives in EPACT 2005 are clearly intended to accelerate commercial deployment, but uncertainty stemming from a national policy on carbon emissions, with respect to coal, and the disposition of spent fuel, with respect to nuclear, were cited by discussion groups as impediments. However, there was some disagreement among the discussants on the magnitude

of those impediments. Other significant challenges for larger-scale deployment addressed below include generation and transmission siting issues and a lack of public support for more coal and nuclear energy.

Siting issues

Generation

While provisions of 2006 SB 888 streamlined Florida's generation siting process, access to large and suitable tracts of land for generation plants still remains a challenge.

Option for mitigation. One discussion group discussed the possibility of incentives for collaborative efforts to select sites but noted that the issue of liability would still remain unresolved.

Transmission

Each discussion group acknowledged the need for adequate transmission capacity for meeting projected energy demand. Federal and state policies appear to provide some relief to that end. At the national level, EPACT 2005 created the designation of a "National Interest Transmission Corridor" in which line approvals may revert to national jurisdictions if affected state and local officials cannot agree on, and help accomplish, the siting and permitting of new lines. On November 16, 2006, the Federal Energy Regulatory Commission (FERC) finalized its rule on transmission siting. In Florida, 2006 SB 888 includes provisions to streamline the transmission siting process. The Florida Reliability Coordinating Council (FRCC) recently approved a transmission planning process that begins with consolidation of all the long-term transmission plans in its jurisdictional region. Plans will include transmission facilities of 69 kV and above. The FRCC will analyze and evaluate each plan and provide recommendations to individual system plans with the intent of improving overall transmission in the FRCC region.

Despite these measures, participants in group discussions pointed out the following barriers: (1) limited sites for transmission facilities; (2) increased vulnerability of transmission facilities during natural disasters; (3) limited interconnections with electricity transmitted from out-of-state; (4) legal challenges during and after the transmission siting process; (5) The "not in my backyard" or "NIMBY" issues and public support; and (6) the capital-intensive nature of transmission projects.

Options for mitigation. Several options for improving the climate for transmission facility investment and construction were suggested in discussion groups:

- Create a transmission corridor within the state with the intent of encouraging the siting of and investment in transmission facilities within that designated corridor.
- Ask Florida's Congressional delegation to support a rule change or waiver from the U.S. Department of Transportation to remove any impediments concerning safety issues for the co-location of highways and transmission lines.
- Review the state's eminent domain statutes to identify provisions that could impede transmission projects, with the caveat that such a review might invite other unforeseen changes to those statutes.

- Consider expediting new transmission projects if the siting of transmission could be done at the same time as the siting of generation.

Renewable energy sources

As one discussion group put it, “Renewables are part of the solution, not the solution.” Nonetheless, there is growing interest in the nation and Florida due to concerns with pollution, climate change, and the supply constraints on fossil fuels. As noted, federal and state tax and rebate incentives are available to encourage greater use of renewable resources electric generation. The FPSC also requires electric utilities to “aggressively integrate nontraditional sources of power generation including co-generators with high thermal efficiency and small power producers using renewable fuels into the various utility service areas near utility centers to the extent cost-effective and reliable.” Despite federal and state policies, cost-effectiveness and reliability are sometimes problematic. With respect to the cost-effectiveness issue, the FPSC requires utilities subject to FEECA to offer purchase contracts to qualifying facilities selling capacity and energy from renewable sources.

Each contract must be priced based on a utility’s fully avoided costs for a minimum contract term of 10 years. FSA 366.051 defines a utility’s “full avoided costs” as “the incremental costs to the utility of the electric energy or capacity, or both, which, but for the purchase from co-



generators or small power producers, such utility would generate itself or purchase from another source.” However, one discussant observed that the avoided cost is sometimes set too low to promote generation from renewable sources. In discussion groups, biomass, in particular, was discussed as being a particularly promising renewable source of power in Florida. Abundant materials are available for biomass fuel, particularly municipal solid waste, and this type of generation offers local employment and keeps money in the community. However, it does have environmental impacts.

Options for mitigation. To encourage greater use of generation from renewable sources, one discussion group discussed the idea of deleting the statutory definition of “avoided cost,” implementing renewable portfolio standards, and imposing a public benefits charge to fund the program. Another group emphasized the importance of education concerning renewables: that they are part of an integrated strategy for meeting projected energy needs and their potential contributions and impacts, including environmental, within that strategy must be based on facts and not perceptions. The same group discussed the option of expanded incentives for encouraging Florida’s investor-owned utilities to invest in capacity from renewable sources.

DSM

Florida's five investor-owned electric utilities along with municipals JEA and OUC are subject to FEECA and are therefore required to implement cost-effective DSM programs. Each utility is required to set numeric DSM goals which are reviewed by the FPSC at least once every five years. These numeric goals have been declining because of highly efficient combined cycle generation technology, more stringent building codes, and higher efficiency heating, ventilating, and air conditioning systems. In aggregate, these changes have reduced the potential savings that might be realized from deferred additional capacity. However, as Mr. Spiller observed, proposals to construct higher-cost coal or nuclear plants also might increase the value of DSM.

One discussion group noted that DSM should be part of the overall portfolio for meeting projected demand because it can save consumers money, and it reduces emissions. The overarching question here is how to persuade people to sign up for DSM. Each discussion group focused on the public's acceptance and understanding of DSM. One group observed that customers need to feel that they can benefit from the program. Utilities often face challenges in getting customers to comply with commitments they made in agreeing to participate in DSM programs.

There was also discussion about the extent to which DSM might be a cross-subsidy in that lower-income customers might be subsidizing middle-class and higher-income customers who take greater advantage of DSM programs. One group noted that DSM does not reduce net consumption, a point also made by Mr. Thompson. In fact, residential use in Florida continues to increase because of the larger size of new homes and the use of a growing number of appliances per household. Therefore, the question of cost-effectiveness arises. To analyze the cost-effectiveness of DSM programs, utilities are required to use three tests: the RIM test, the Total Resource Cost test, and Participant tests. Yet, all these tests have their specific applications and therefore their limitations. As one group observed, the cost-effectiveness of DSM is difficult to measure and verify. Finally, another group noted that the economics for DSM are different than for energy efficiency strategies because DSM shifts load from peak to non-peak usage, so base load generation will still be needed. By contrast, energy efficiency strategies reduce base load.

Option for mitigation. Learning more about how DSM programs operate and their impacts on customer loads would be useful. To that end, four municipal electric utilities in Florida share databases on DSM programs. One discussion group discussed the option of a shared database among Florida's electric utilities to identify "best practices" for cost-effective DSM programs. This group noted that such a collaborative effort among investor-owned utilities exists in California.

Conservation

One approach that may contribute to deferring construction of new power plants is energy conservation. One group noted that it is cheaper to improve energy efficiency than to pursue alternative strategies. Another group stressed the importance of promoting energy conservation by developing a "culture of conservation" through educational efforts. However, there are challenges in educating the public to conserve more energy, and conservation strategies might result in resistance from both consumers and developers.

Options for mitigation. Although education is considered essential to promoting greater energy conservation, other more specific options were discussed: improving building codes, increasing energy efficiency standards for appliances and providing financial incentives to that

end, and sending proper price signals to consumers through the use of real-time pricing. One group suggested lenders be encouraged to review energy costs for homes when making decisions on mortgages.

Public support/ NIMBY

Each discussion group acknowledged the importance of public support for coal and nuclear plants and transmission projects and the NIMBY syndrome associated with siting such facilities. Central to determining public acceptance is an understanding of the price elasticity of various supply and demand reduction strategies and the development of credible survey instruments for gauging representative views regarding acceptable proposals. As one group noted, public perception of associated risks affects support for energy supply strategies such as the risk of advanced and largely unproven generating technologies, a nuclear accident, oil spills in the Gulf of Mexico, or the health effects of mercury emissions. Opponents of proposed new generation projects might oppose both the commodity used (coal, nuclear) as well as specific siting proposals.

Options for mitigation. Public information based on facts and not perception is central to garnering public support for new generation, transmission, or supply reduction strategies. For example, deliberations on nuclear energy might focus on the need for identifying solutions for spent fuel but also list the advantages for communities with such facilities such as large infusions of revenue for local governments and schools and good paying jobs.

Steps for moving forward

An understanding of what matters to each stakeholder is particularly important in crafting effective strategies for meeting projected demand. So it might help future deliberations on this general topic if those interests are identified upfront. For investor-owned utilities, the strategies have to represent a favorable return on investment. Consumers need to perceive that strategies have value for them, so proper pricing signals are important. Environmentalists need to feel their opinions have been incorporated into the decision-making process. Municipal utilities need “buy-in” from local officials and consumers. For example, Mayor Marks noted that, even though it was not required, the need for additional capacity was subject to a local referendum. Regulatory uncertainty increases with changes in administration, so a positive relationship among the FPSC, the legislature, and other affected parties might contribute toward greater stability in state policies.

To conclude, Florida statutes require cost considerations in the FPSC approval of proposals related to additional capacity or demand reduction. As one discussion group observed, “Anything more we should do will cost more because if it is cost-effective, we’d already be doing it.” The groups agreed about the importance of an integrated portfolio of strategies to add capacity, reduce demand, and thus reduce risk. No strategy should be disregarded because it may be cost-effective, if not now then in the future. The groups touched on many topics related to increasing capacity and reducing demand, but transmission, DSM, the responsibilities of affected parties to mitigate risk, and public response and education appeared to receive particular attention.

Appendix I

Understanding Fuel Diversity Trade-offs and Risks: Making Decisions for the Future

PURC Energy Policy Roundtable

Tuesday, Oct. 31, 2006

8 a.m. – 5 p.m.

Turnbull Conference Center, 555 W. Pensacola St., Tallahassee

Purpose

For almost two decades during the 1980s and 1990s we operated in a world of secure fuel supplies, stable or declining prices of primary fuels, and more predictable and less stringent environmental policy. The last six to eight years have introduced a reversal of past trends with natural gas and petroleum prices increasing and becoming more volatile, hurricanes and geopolitical forces disrupting energy supplies, increasingly stringent environmental regulations raising utility costs, and looming uncertainty over climate change policies introducing added risk and uncertainty into utility planning. Even though the world has changed, Florida's electric utilities are still expected to meet the energy needs of their expanding customer bases as cleanly, reliably, and cost-effectively as they have before.

The Fall Roundtable on Energy Policy will focus on the decisions that must be tackled in this climate of uncertainty and the trade-offs that confront government and industry as they craft plans to serve Florida's projected future energy needs in the cleanest, most reliable, and most cost-effective manner possible. Legislators, policy makers, regulatory and utility professionals, consumer advocates, and other interested stakeholders are invited and encouraged to attend. Roundtable participants will put themselves in the position of decision makers in formulating the best strategies for increasing both supply-side and demand-side resources while assessing and confronting the various risks for customers, shareholders, and regulators related to uncertainties in long-term future energy prices, future environmental policies and regulatory treatment, and changes in technology.

PURC Energy Policy Roundtable
Tuesday, Oct. 31, 2006
8 a.m. – 5 p.m.
Turnbull Conference Center, 555 W. Pensacola St., Tallahassee

Agenda

- 8:00 – 8:30 a.m. **Registration**
- 8:30 – 8:45 a.m. **Welcome**
Dr. Mark A. Jamison, Director, PURC
Mayor John Marks, Mayor of the City of Tallahassee
- 8:45 – 10:15 a.m. **Meeting Electricity Demand in 2015: Past, Present, and Future Conditions on the Supply-Side**
What are the conditions that have led us to our current supply portfolio?
What are the forecasts for population, fuel prices, energy and environmental policy and technological development? How robust are the forecasts?
- Moderator:**
 Paul Sotkiewicz, Director of Energy Studies, PURC
- Speakers:**
 Joel Bluestein, President, Energy & Environmental Analysis, Inc.
 Tim Chapin, Assoc. Professor, Dept. of Urban & Regional Planning, FSU
 Michael Haff, Sr. Engineering Specialist, Florida Public Service Commission
- 10:15 – 10:30 a.m. **Break**
- 10:30 – 11:30 a.m. **Morning Breakout Groups**
Groups discuss strategies for decision-making, as they identify the risks to utilities, consumers, and government officials.
- Facilitators:**
 Lynne Holt, Policy Analyst, PURC
 Mark A. Jamison, Director, PURC
 Bob Rowe, Senior Partner, Balhoff & Rowe LLC
 Mark Spiller, Principal, MACTEC Engineering & Consulting Inc.
- 11:30 a.m. **Lunch**

- 1 – 2 p.m. **The Potential of Price Response, Demand-side Management and Energy Efficiency**
- Moderator: Paul Sotkiewicz**, Director of Energy Studies, PURC
- Speakers:**
Mark Spiller, Principal, MACTEC Engineering & Consulting, Inc.
Jim Thompson, Team Leader - Pricing and Load Research, Gulf Power
- 2 – 3:30 p.m. **Afternoon Breakout Groups**
- Which decisions might be made with respect to meeting future demand while addressing/mitigating identified risks?
 Groups identify possible “fuel diversity” portfolios and identify the decisions and trade-offs that must be made to achieve the portfolio.
- Facilitators:**
Lynne Holt, Policy Analyst, PURC
Mark A. Jamison, Director, PURC
Bob Rowe, Senior Partner, Balhoff & Rowe LLC
Mark Spiller, Principal, MACTEC Engineering & Consulting, Inc.
- 3:30 – 3:45 p.m. **Break**
- 3:45 – 5 p.m. **Reporting from Groups and Synthesis**
- Discussants:**
Paul Sotkiewicz, Director of Energy Studies, PURC
Mark A. Jamison, Director, PURC
- 5 p.m. **Adjourn**