BEFORE THE
FLORIDA PUBLIC SERVICE COMMISSION

In the Matter of:

COMMISSION REVIEW OF NUMERIC CONSERVATION GOALS (FLORIDA POWER & LIGHT COMPANY).	DOCKET NO. 080407-EG
COMMISSION REVIEW OF NUMERIC CONSERVATION GOALS (PROGRESS ENERGY FLORIDA, INC.)	DOCKET NO. 080408-EG
COMMISSION REVIEW OF NUMERIC CONSERVATION GOALS (TAMPA ELECTRIC COMPANY).	DOCKET NO. 080409-EG
COMMISSION REVIEW OF NUMERIC CONSERVATION GOALS (GULF POWER COMPANY).	DOCKET NO. 080410-EG
COMMISSION REVIEW OF NUMERIC CONSERVATION GOALS (FLORIDA PUBLIC UTILITIES COMPANY).	DOCKET NO. 080411-EG
COMMISSION REVIEW OF NUMERIC CONSERVATION GOALS (ORLANDO UTILITIES COMPANY).	DOCKET NO. 080412-EG
COMMISSION REVIEW OF NUMERIC CONSERVATION GOALS (JEA).	DOCKET NO. 080413-EG

PROCEEDINGS: DSM GOALS WORKSHOP

BEFORE: CHAIRMAN MATTHEW M. CARTER, II
COMMISSIONER LISA POLAK EDGAR
COMMISSIONER KATRINA J. McMURRIAN
COMMISSIONER NANCY ARGENZIANO
COMMISSIONER NATHAN A. SKOP

DATE: Monday, December 15, 2008

TIME: Commenced at 1:00 p.m.
Concluded at 3:52 p.m.

PLACE: Betty Easley Conference Center
Room 148
4075 Esplanade Way
Tallahassee, Florida

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P R O C E E D I N G S

CHAIRMAN CARTER: I know that was only 40 seconds, but I'd like to call this workshop to order. I want to welcome everyone this afternoon. I hope you had a safe weekend. Good to see everybody, all of these smiling faces here; we have our Commission workshop on numeric conservation goals.

Counsel, would you please read the notice.

MR. SAYLER: Pursuant to the notice issued by the Commission Clerk, this time and place has been set for the purpose of conducting a Commission workshop regarding the review of the numeric conservation goals in Docket Numbers 080407 through 080413. The purpose of the workshop is set forth more fully in the notice.

CHAIRMAN CARTER: Today, Commissioners, and those that are participating, we and our staff may ask questions during the workshop. We will also provide an opportunity for comments from other interested parties. And without further ado, we are set to begin.

So at this time we have the presentation from the results of the technical potential study from Itron and KEMA, and let's go with the technical potential study results.

Who's on first, staff?

Okay. You may proceed.

MR. RUFO: Thank you, Chairman. Thank you, Commissioners.

My name is Mike Rufo, I'm Co-managing Director of Itron's consulting and analysis group. I know many people may be familiar with Itron as a metering and software company, but we also have a consulting practice, and this consulting practice is very focused on energy efficiency, demand response, and distributed generation. We have got about 50 people in this group, economists, engineers, those types of folks.

I've been doing these kind of energy efficiency potential studies myself for about 20 years. I've worked with utilities all over the country and all over the world, as well as government agencies. And I really want to commend Florida, the utilities and the Commission for initiating this study. I think it is a very timely study, and it is a very comprehensive effort. We have been involved in dozens and dozens of these studies over the years, and this is one of the more comprehensive efforts that we have seen capturing the economies of scale across utilities in a collaborative environment engaging in some primary data collection, which is very important. So we want to commend the PSC and the utilities and the collaborative for this effort.

So our project manager on this effort is Mike Ting. I'm going to turn it over to Mike, who's going to do most of the talking today. I'm going to speak a little bit about the methodology in a few minutes and also a little bit about the DR and other questions that may come up. So with that, I'm going to hand it over to Mike.

CHAIRMAN CARTER: Good afternoon and welcome.

MR. TING: Thank, you Chairman. Good afternoon, everyone. I will just get right into it. We have a lot of material to cover, and I will try to go quickly but not too quickly.

This first slide is just an overview of what we are going to go -- what we are going to touch on schematically. We are going to introduce some of the objectives of the study at a high level. I'll give an overview of the concepts and terminology used in potential studies to make sure everyone is speaking the same language and highlight some of the key points in the methodologies and the tech potential studies.

The bulk of the presentation is going to be showing everybody a review of the input data sources, the data development effort that went on in the front end of this study, then we're going to highlight some of the key baseline results from an end-use building type perspective and move on to the tech potential results for energy efficiency.

We are also going to kind of go through the same pattern for the demand response analysis, although at probably a lower level of detail. A little bit more high level overview on the concepts, terminology, methods, data development, and then, again, at the end hit on the results for the DR analysis.

So just a few slides on the background of the study.

This is really hard to read. I apologize for that. The primary objective of the study was to assess the technical potential for reducing or avoiding electricity use in peak demand by implementing a wide range of end-use efficiency and demand response measures as well as rooftop PV installations in the seven FEECA utilities in Florida, which begs the question why do we do these types of studies.

And, you know, the bottom line is that in order to get a good idea of what the achievable potential is from running actual utility programs, the very first step in that type of study is estimating technical potential, so this is the foundation for moving forward into the economic and achievable potential forecasting parts of the study.

Very quickly, the seven FEECA utilities that funded this collaborative project were Florida Power and Light, Progress Energy, Gulf Power, Tampa Electric, JEA, OUC, and the Florida Public Utilities Company. Also part of the collaborative in an advisory role were the Southern Alliance for Clean Energy and the National Resource Defense Council. They have been involved in all the meetings and plannings and a lot of the review and active planning and execution of the study.

Real quickly on the scope of the study, and this slide is just to get some understanding of the bounds of the study, of the analysis. At the highest level, the highest level boundary is we are looking at just electricity consumption and peak demand in the service territories of the seven FEECA utilities. Again, those utilities account for 90-plus percent of the total consumption and peak demand in the state of Florida.

What we presenting in this first part is the energy efficiency potential analysis, however, there are -- which is energy efficiency measures at the end-use level. There are two actual renewable distributed generation technologies that are included in this EU potential analysis, and it's mostly because they are at the end-use level specifically, so solar water heating and PV powered pool pumps. And they lend themselves to the end-use treatment that we will describe that applies to the energy efficiency analysis.

That said, there is also -- we also did an analysis of demand response, which includes direct load control and advanced metering infrastructure, as well as rooftop solar PV. Those two analyses for tech potential were done outside of the energy efficiency analysis framework and were done in a scenario-based framework which we will describe towards the latter half of the presentation. So those were covered in the scope of our study, but they were done in a different analysis framework.

The sectors, the demand sectors that were included in the analysis are the residential, commercial, and industrial sectors. We point that out to mention the sectors that were excluded from the energy efficiency potential analysis, and those sectors are the agriculture, what we refer to as transportation, communications, and utilities sector. This includes anything like rail, telecom, power demand and consumption by the water, gas, or electric utilities themselves, as well as the construction and outdoor street lighting.

In this slide, you know, we are kind of giving the primary reason why these sectors are typically excluded from energy efficiency potential analyses. For agriculture and TCU, there is a relative lack of primary research on end-use baselines and efficiency opportunities in those two sectors. Constructions are temporary service loads, so they don't -- it's very difficult to receive predictable energy efficiency benefits from efficiency interventions in the construction sector.

In the case of outdoor street lighting, that market tends to transform and has mostly transformed on its own. Meaning that, for example, the saturation of LED traffic lights has really taken off and been a natural market force in traffic lighting over the past ten years. And the same is true in street lights with the movement towards pulse-start metal halide lamps, which are one of the most efficiency options for street lighting.

So to put an idea of what that means in terms of the amount of sales and peak demands that are covered in the study, about 84 percent of the total sales of the seven FEECA utilities are quote, unquote, in-scope, were in-scope for the efficiency potential analysis, and those out-of-scope sectors accounted for about 16 percent of total sales in 2007. So, bottom line, we are capturing the lion's share of consumption in peak demand in the scope of the study.

I'm going to quickly turn back to Mike Rufo to go over the concepts and methodology and some of the terminology used in efficiency potential studies.

Does the Commission have any questions just on the study scope?

CHAIRMAN CARTER: Commissioners, do you want to wait until the complete presentation?

Yes. Let's proceed.

MR. RUFO: Okay. Thanks, Mike.

Okay. I'm going to walk us through some of the methodological and approach background slides for the study. And, I don't know, you may have seen some of this before in your previous meeting. I'm not positive from the transcript.

But the basic framework that we used for this study is what we call bottom-up methodology. And in this bottom-up methodology, we model and characterize individual energy efficiency measures within different customer market segments.

So, we have several hundred measures -- Mike, I don't know the -- 276 measures, and dozens of different customer segments. For example, within the commercial sector we will break up into office and retail and those kinds of things. When you combine the measures and the segments, you know, we will have several thousand combinations of measure applications and customer segments for each utility.

It is a very data intensive process, but it is a very useful process for these kinds of studies because, you know, it really allows us to provide a lot of transparency and information for resource planning and for program planning. When you aggregate the data a lot more than that, a lot of things kind of become muddied; but when you drive things down to the measure level characterizing the cost and the savings and the market saturation, you can have, I think, a more fruitful conversation about what some of the issues are and what some of the opportunities and challenges are.

So in this approach we are going to be developing annual impacts, energy and demand, summer and winter demand, as well as cumulative impacts over a ten-year period at the utility service territory building type, by vintage, by end-use, and by measure.

The next slide. So types of efficiency potential. This is one set of nomenclature in the industry. It is fairly standard, but I won't say completely standard. Different authors at different points of time may have different definitions of these things. There is not a Mount Olympus in the industry upon which there is perfect consensus on these terms, but there is mostly consensus on how these terms get used.

Technical potential is a theoretical construct that is -- if you could wave the magic wand and swap out all of the less efficient with all the most efficient equipment, what would the potential look like regardless of economics and regardless of the timing of when those opportunities might actually become available.

Economic then applies an economic filter to the technical potential, and those filters can vary. Different types of economic filters can be applied from the utility perspective, or from the customer perspective, or other perspectives, but economic is basically the technical potential of all the measures and segments that pass that filter, whatever it may be.

Achievable and naturally occurring have to do with adoption in the real world. So given that pool of potential, what's a likely forecast of adoption both with and without program intervention. So naturally occurring is the forecast of adoption without any program intervention, and achievable is the forecast of adoption with the program interventions. And those take into account the availability of measures over time.

For example, a chiller may only become available once every 20 years at the end of its service life. So it takes into account those phasing issues with capital equipment; it takes into account barriers and preferences that customers have about what they adopt and why, and what their discount rates are, and what they see as the benefits and the nonbenefits of each of the measures.

So today that's all well and good. We're talking about -- oops, where's my button -- the technical potential, so this is what we really consider an interim step. It is an important step on the path to getting to achievable and naturally occurring estimates of potential which are useful for forecasting and goal setting and program design. But we are here today to focus on this interim step, the technical potential, because, you know, this is a funnel in the downstream types of potential which are, you know, really the ones of primary interest flow somewhat from the technical. Although, as I think you will see through the course of the study, the factors that come into play down at the achievable and naturally occurring level are just as big if not bigger than the factors that are influencing the technical potential.

Okay. So technical potential tends to provide an upper bound on potential from a technical feasibility point of view. The primary filter there is an engineering filter. You know, is it feasible from an engineering point of view to apply this measure and in what percentage of the building stock. So, an example might be automated perimeter dimming for commercial lighting systems that interact with daylight. Well, the technical potential for that measure is going to be constrained to the portion of commercial floor space that's within ten feet, or whatever the number is, of a daylighting source. So the technical potential would be restricted. It wouldn't include all commercial floor space, it would be restricted to the floor space that is applicable, technically feasible for perimeter dimming. But it would not then consider other factors, such as customer acceptance.

Now, that is the way it is defined. You know, you do get into gray areas with these things between what is an engineering constraint and what is a customer adoption or market constraint or a supply constraint.

I think I covered most of these points already. We will just motor along to the next slide. So this is just a simple mathematical identity that we use in the technical potential. It flows from the baseline work that we do in these studies. So before we can estimate potential we have to really characterize how the energy is currently being used. So we need to go to a lower level of detail in these studies than is typically needed for other applications of utility data. We need to go well below the system level and well below the sector level. We need to develop baseline data for building types and end-uses within building types. So we need information. In the commercial sector we typically normalize the analysis on a per square foot basis, and in residential per household, and so what we need to do, thinking about the -- well, maybe residential first because that's easier. We need to work off of estimates of, you know, what is the average kilowatt hour per home for central air conditioning. What's the average kilowatt hour per home consumption for lighting, for water heating, et cetera.

And then we need to make sure that when we take all of these, this aggregated estimates of baseline consumption and we multiply by the saturation of equipment and the number of households, that we take care to ensure that some of that is not more nor less than what the observed total consumption for the system is. And it sounds maybe a little obvious, but there have been studies done in the past in this area that didn't go through that fundamentally important control step, and hence significantly underestimated potential just because they got the baseline wrong.

Fortunately, here in Florida we have a lot of very good baseline data. Many other jurisdictions where we have worked we have had little to no baseline data to work with. So, again, I commend the work that has been done in the state in the past and on the study to focus on that, and I think there has been a recognition of the importance of that kind of information all along here in Florida.

So what we do here is we take the total baseline consumption and we estimate the total square footage, say, in the commercial sector, and then we look at what the different saturation levels are. What is the saturation of electric heat, what is the saturation of electric water heat, cooking, all of those things. And then we have to confirm and sometimes refine any estimates of what that baseline consumption is, and then we can start applying the energy efficiency estimates to that.

So once we have a handle on, okay, the average consumption for commercial lighting in the typical office building is 4.5-kilowatt hours per square foot, that's the number that we are going to start then saving off of. So then we move on to applying our estimates of what the engineering feasibility of the measure is, what the percent savings opportunity is, and another critical variable, what percent of the market has already adopted the measure.

So take compact fluorescent lamps, or T8 high efficiency fluorescent fixtures, a chunk of the market has already adopted those measures. We don't want to double count that, so we remove the portion of the market that has already adopted those measures.

So that is fairly straightforward, but very data intensive. That equation is being operationalized on these couple of thousand combinations that, as I mentioned before, have measures in market segments. And we do that for both energy and summer and winter peak demand.

Now, when we do that, though, that's what we call our basic, our nonadditive. That's the first step. Because there are a lot of energy efficiency measures that compete with each other for the same kind of application, or interact with each other, and I'll explain that in a minute, you can't sum the results of that first calculation that I just showed you, because you will have double counting.

The simple example of this kind of double-counting or problem that has to be addressed is with respect to interaction. Say you are looking at the potential of a high-efficiency chiller, which is a central air conditioner for large commercial facilities, and a shell measure that reduces the load on the building, say you are applying window film. Well, if you take the savings of the window film measure as applied to an inefficient cooling system, and then you take the savings from the efficient cooling system, you don't want to add those together, because that's not the same as applying the window film to reduce the load and then applying the high-efficiency air conditioner to the reduced load so the savings will be slightly less. So that's just a step that has to be gone through.

The other cases of competition interaction is you may have two or three different ways to get to the same efficiency level in the market. And in a technical potential study we have got to kind of simplify. We are not going to try to model every possible measure and decision in the economy, so there are some decisions that get made between Flavor A, Flavor B, and Flavor C that really get you to the same place.

So what we do to handle this interaction to avoid a lot of this double counting is we develop what is called an energy efficiency supply curve. Sometimes it's called a conservation supply curve, which is fairly analogous to supply-side resource curves. And basically what we do is we have to determine in ordering for these measures from -- usually we do it in terms of the economics, so we will typically apply the most economic measures first in this sorting order and the least economic measures last. So we apply them in a sequential order to deal with these interactive effects. And I can take questions on that later, if you want. But the result of that is that it gives us a controlled estimate of technical potential that doesn't have this double-counting problem.

So I think I am just going to go on and show you a little example here. This table just shows what we actually do is we start with, as I mentioned before, an estimate of the total consumption in a particular segment, so this could be commercial lighting, and in this example this segment has 425 gigawatt hours of base consumption associated with commercial lighting. And the EUI, the kilowatt hours per square foot, the normalized characterization of that consumption, its intensity, the energy intensity of that load is 4.3-kilowatt hours per foot. From there we start to apply these different measures, and every time we apply a measure we recompute what the sector level EUI now is that we have applied this technical potential.

So, the first row, the T-8 with electronic ballast starts with the starting seed value of the current consumption of 4.3-kilowatt hours per square foot. The second measure now is an occupancy sensor which is the control technology that is going to turn the lights off when the room is unoccupied is an example of that interaction. If you took those savings as compared to the original consumption of 4.3, you would get a higher technical potential than if you took those savings after you have applied the more cost-effective high-efficiency fluorescent measure, the T-8.

So the recomputed EUI after the T-8 measure, the first measure that is applied is the 3.4-kilowatt hours per square foot, because now we have saved 20-something odd percent of the energy by first applying the high-efficiency fluorescent fixture. So the base case upon which the next measure of savings is calculated is reduced, and so on. So that's how we start with the total consumption, and we make sure that we are always sharing down from that in a way that is internally consistent and avoids this double counting problem.

The next slide just shows after you have done that for all of these different combinations of hundreds of measures and dozens of market segments you can compile all of those results into an energy efficiency supply curve. And this is not the results for this study. We have those later in the presentation, this is just illustrative.

So it shows on the left axis, which is what we call the levelized cost of conserved energy, so that's taking the incremental cost of the measure and levelizing it over the measure life with a particular discount rate and then dividing it by the energy savings. So those are dollars per kilowatt hour saved.

And then on the bottom axis we have the cumulative savings in gigawatt hours, and you can also look at that as a percentage basis. So that's showing that for less than five cents a kilowatt hour in this example there is a little bit over 9,000-gigawatt hour of technical potential. So that's the background on the technical potential.

I'm not presenting -- we're not presenting today on the methods unless you want to later in the day, or whenever you would want. We can also present a little bit on how achievable potential gets handled. But the focus for today was technical, so that's what we have on that. And we will move on to some of the initial results, unless you want to do interim questions.

CHAIRMAN CARTER: Commissioners, at this point do we have any questions, or do you want to proceed further? Let's proceed. Just as an FYI to those that are participating, again, there may be other interested persons, when we do the questions and answers we will obviously give an opportunity for those questions, as well.

Thank you. You may proceed.

MR. TING: For this next section we are going to review the data development, development of the inputs for the study. And I think Mike mentioned that most of the heavy lifting in the tech potential analysis is really on this front end in data development, and we wanted to spend some time reviewing the data sources that we used because there were many, and a fortunate part of this study is that there is a lot of primary data available in the state of Florida through the utility efforts over time in R&D and program administration as well as organizations like the Florida Solar Energy Center and the University Research Group.

So this slide just kind of reviews at a high level the types of input data that go into a bottom-up baseline analysis and an energy efficiency measure analysis. So kind of the key parts of baseline data are counts of actual number of customers, or housing counts in the residential sector, estimates of floor area, square footage by building type in the commercial sector. The end-use energy intensities, these could be kilowatt hour per dwelling in residential or kilowatt hours per square foot in the commercial sector. The saturation of different types of end-use equipment, for example, central air conditioners versus central heat pumps. The load shape of end-use equipment, that refers to how the load changes over the course of the day and over the course of the year typically by hour. And then, of course, the other key piece in the baseline analysis are the actual utility sales and peak demand from a top-down perspective based on sales. And, you know, in these studies these serve as the top-down control totals so that we make sure that our bottom-up baselines are reconciling within reason to actual top-down utility sales numbers.

On the measure side, we had a couple of slides kind of summarizing this earlier, but we need data on the measure costs, the dollars per unit, the amount of labor dollars per widget needed to install the measure, the relative savings that the measures provide on a percentage basis, estimates of the feasible market shares of measures from an engineering and practicality point of view, and then, finally, the saturation of those measures in the current stock in time zero, meaning today, so that we don't double count a potential resource.

This next slide, and this is much better to read on the handouts, I apologize for the people that don't have a handout. I probably tried to put too much information on here.

But, again, it's expressing the level of segmentation that was used in this analysis and most bottom-up frameworks. And, you know, at the high level we have residential, commercial, and industrial sectors. Within each of those, three different building types in the residential sector, about eleven building types in the commercial sector, and I think about 15 or 16 different industrial subsectors, existing and new construction, and then in each one of these sectors 10 or 12 main end-uses. So we slice and dice across all of these dimensions in the analysis. A lot of little numbers as we like to say.

This is a table just summarizing the units of some of these baseline data and how it varies a little bit between sectors. Numbers of household, square feet of floor space, share of households with technology X installed, et cetera.

So on the residential side we're just going to go over where these data came from for this particular study. Customer counts and total annual sales to residential customers. These came directly from the utility Customer Information System and billing data. The end-use saturations and technology densities, the primary source for this study, we leveraged the results of the Home Energy Survey, the 2006 statewide Home Energy Survey, which I believe was mandated by the Commission, I think. And that was about 1,200 residential on-site surveys statewide and six of the seven utilities that were in the scope of this study. That gave us a tremendous starting point for the residential end-use baseline analysis. These were done on a utility specific level. The sample sizes, however, in some of the utilities were too small to get a statistically significant result. So what we actually did, we had about 800 points, seven or 800 points in the FPL service territory, and then for the rest of the utilities we actually aggregated them together and did a population weighting to come up with a statewide average result. And we did some comparisons between the utility-specific results, and there wasn't a tremendous amount of variation, so we felt more comfortable with using statewide averages for the equipment saturation and some of the baseline end-use inputs.

Gulf Power and JEA also provided the really detailed results of a couple of internal saturation studies that they had done recently, and both of those surveys had sufficient sample sizes to support using utility-specific estimates for those two service territories to supplement the 2006 statewide results from the home energy survey.

Now, on the end-use energy intensity side for residential households, for HVAC and water heating these are the kWh per household numbers. Itron has been supporting FPL's program research and development as well as evaluation activities for about the past ten years, and so we were able to leverage a lot of the previous work that Itron had done for FPL in support of their programs estimating in-situ energy and peak demand for heating, cooling, and water heating loads.

Those analyses were done at the climate zone level, by building type, and by different base technologies. So, for example, central air conditioners versus heat pump systems, separately for those. We did make some adjustments to those previous estimates that Itron developed for FPL for space heating and water heating in particular. And the logic behind that was that for the northern and central climate zones of Florida, FPL's service territory in northern and central Florida actually has slightly different weather patterns than the rest of northern Florida and the rest of central Florida.

And so we used heating degree-day data for each of the other utility service territories in northern and central Florida to construct some scalers for the space heating and water heating UECs that were developed specifically for FPL in the past, and so we had to do some weather adjustments for the other service territories because of significant differences in heating degree-days.

Similarly for water heating. The inlet ground temperatures and the water temperatures in the FPL service territory are pretty high, usually around 80 degrees. And based on some data, ground water temperature data that we had for the other service territories, we also constructed some scalers to account for lower average inlet water temperatures in the other service territories in Florida. Both of these adjustments resulted in slight increases in the space heating and water heating UECs in the other service territories.

For lighting and appliances we used a variety of Florida-specific sources. We leveraged the study that is being done by the Florida Solar Energy Center for Progress Energy. I'm sorry, that was done by FSET for Progress Energy a couple of years ago. They actually monitored a couple hundred homes in the Progress Energy service territory. We also leveraged some results that were Florida-specific results that were available from the Energy Information Administration's residential Energy Consumption Survey in 2001.

For electronics, which is a growing -- you know, electronics plug loads in households, which is a growing end-use in general nationwide hasn't been the subject of a lot of analysis in these types of technical potential studies in the past. For this one we were actually fortunate to leverage some recent work that has come out in the past couple of years. These are kind of at the national and regional levels. They are not Florida-specific, but these studies are definitely one of a kind and very good.

One was an actual field measurement. Some plug load monitoring that was done in California recently for the California Energy Commission, and the second one was a nationwide study that was done by Curt Roth (phonetic) from TIAC LLC (phonetic), and Curt has been doing assessments of consumer electronics saturation consumption in the U.S. for the past six or seven years. He is probably the best at what he does in that area. So we were able to leverage these relatively recent studies to be able to specifically treat things like TVs, PCs, DVD players, VCRs, set top boxes.

On the commercial side, to get at the baseline customer counts and annual sales, the first task was to create that baseline for the 11 building types and to get those top-down control totals, but by building type rather than for the total commercial sector. And to do that, what we used was the information on SIC codes. SIC refers to the Standard Industrial Classification. And we used a mapping that we have developed over the years that maps detailed SIC codes to building types. And so the customer billing data contains these SIC codes and allowed us to map commercial sales into these 11 commercial building types.

Now, this level of SIC data wasn't available for a few of the utilities, and this presented a bit of a challenge. What we did to deal with that is that we actually matched, we leveraged -- the census produces data on full-time equivalents, this is kind of employment statistics by SIC code by zip code. And so we were actually able to use census data at the zip code level to be able to come up with these estimates of FTE by SIC type, and then we matched that to kWh per FTE estimates that are available from the EIAs commercial building energy consumption survey. This was the 2003 version of the survey. So we used this matching between FTE by business type by zip code with the kWh per FTE by business type to be able to distribute total commercial sales across these 11 building types for the utilities that didn't have complete SIC data.

So using that method we got to a complete baseline by building type for all the utilities. On the end-use energy side in terms of EUIs and saturations and load shapes, again, we were fortunate to be able to leverage some previous work that was done for FPL. This was done by a consulting group formerly known as RER, which is actually part of Itron now, but they did a pretty extensive, about a thousand point on-site survey of commercial and industrial customers in FPL's service territory circa 1996, and it was pretty -- it was a significant effort. A thousand on-sites, building energy simulations for each site, and then they scaled those results and population levels. So we were able to leverage that data significantly for this study for the commercial baseline, and we also supplemented that with some more recent information and market assessments in California available from FPL's commercial and industrial programs.

Now that said, the utilities for this project realized early on that even though we have this data source available circa 1996, that commercial markets are pretty dynamic, and they agreed to collect some primary data for commercial customers, and that takes the form of a 600-point on-site survey that is now wrapping up. The survey was conducted in the service territories specifically of FPL, Progress, and Gulf Power. That survey is being administered by KEMA, who's a subcontractor to Itron for this study. These surveys are going to provide, you know, refreshed data on building characteristics, end-use baselines, and in particular for this study the current saturation of energy efficiency measures since the commercial markets for commercial lighting, for example, have been very dynamic since 1996.

And the way that this is going to impact the technical potential study and this study going forward, as I said before, it is wrapping up, it is not quite out of the field. They are going to be out of the field by, before Christmas, so in the next ten days or so. All the data entry and analysis is scheduled to be completed by mid-January. At that point what's going to happen is that we are going to use the results of the survey to basically true-up the baselines that we have constructed based on this 1996 vintage data.

The impact that that is most likely to have on the current set of results that we have for the commercial sector is -- probably affect the distribution of the efficiency potential a little bit more than the total level, so kind of a shifting around between end-uses and between measures.

What will affect the level, the total aggregate level of potential will be any revisions to the current penetration of energy efficiency measures. So we have developed some estimates for the current penetration of measures, but it is largely based on anecdotal evidence. So any significant differences between what we have developed now and what we are applying now and what comes out from this survey work, that will affect both the distribution and the level since that is a pretty strong filter in the technical potential analysis. This is just to give you an idea of how the survey work is going to affect the numbers that you are about to see later on.

On the industrial side, again, we use customer-level data on SIC code on business activity type to map sales into 16 industrial subsectors. And, again, these subsectoral totals serve as the top-down control totals for calibration purposes. End-use shares for the industrial sector came from a national source, the Manufacturing Energy Consumption Survey, again run by the EIA. And, you know, the manufacturing sector, in general, tends to -- within subsectors tends to be more homogenous and less regional specific compared to residential commercial sectors. And, in general, there is not a whole lot of region-specific end-use data for industrial customers. This is a national source that is being applied to actual sales in the Florida service territories.

We are also able to leverage large customers that have interval meters in Florida. That is sometimes 15-minute data, sometimes hourly data, but that gives us very customer-specific load profiles that we are able to integrate into the analysis. And we had interval data, I think, for four of the seven utilities, so it was a pretty large set of interval data to use to develop industry-specific load profiles. So that's the baseline kind of data development and sources in a nutshell.

Now I'm going to talk about the measure data side. This slide is, again, just a review of the units that are associated with each of these variables, and the variables being cost savings, saturation, and feasibility. These are all pretty straightforward. Dollars per unit on the cost side, percent savings for energy and peak savings, saturations are, again, a percentage in terms of percent of households or percent of floor space. Feasibility is also a percentage.

Now, I have a couple of slides just on kind of the scope of the measures that were analyzed. They are kind of three categories of measures, retrofits, replace-on-burnout, and new construction with some examples. Retrofits are ones that you can do immediately, like a screw-based CFL, or a maintenance measure, or a control measure. Most types of insulation measures are also retrofit. If you don't have ceiling insulation, you can go up in the attic and put it in. You don't have to wait for any other event.

Replace-on-burnout refers to types of measures that are typically where the opportunity presents itself, typically at the end of a useful life of a piece of equipment. So, central AC, a chiller, a water heater, a pool pump, or windows.

New construction refers to opportunities that usually happen in bundles and happen at the time of construction. Including there are some packages like ENERGY STAR® homes, which is a set of guidelines, or there are opportunities for integrated system design. Those opportunities typically only present themselves at the time of construction.

So in terms of the scope of the measures, in general in these types of studies we try to limit the scope to measures that are currently available in the market and that have some kind of independently verified cost and savings estimates. We tend not to use manufacturer claims as the sole source of cost and savings data, and we also generally don't consider a whole lot of emerging technologies, particularly ones that haven't been commercialized yet.

For this study it's noteworthy to point out that we did consider several measures that are likely to face some near term constraints in terms of availability, product availability in terms of capacity on the distribution and contractor supply chains. These measures in particular are SEER 19 central AC units, a system known as a hybrid desiccant-DX cooling system, which is a replacement for package rooftop units in commercial buildings. Solar water heating is certainly an advanced technology. Its costs have not come down dramatically over the past few years, so we still tend to think of it as emerging. Heat pump water heaters, the same story. They have been around for awhile, but the costs are still pretty high. There is still some progress to be made in heat pump water heaters for the mass market. But those are on the measure list.

So this slide just kind of quickly reviews the process that we went through on the measure list, because it was definitely a collaborative effort. The utilities constructed -- had a minimum list that they wanted examined that was itemized in the RFP for this project. Itron also offered up additional measures that were not on that minimum list on the RFP, and these were based on measures that we had analyzed previously in other studies in other jurisdictions. There were additions that came from current programs in Florida that were additional to this measure list, and then there were even additional measures that were provided just by members of the collaborative.

So once we had this comprehensive list of measures that we wanted to include in the study, Itron did the initial assessment of the data availability for each of these measures and the assessment of any modeling or data issues that might be problematic, and this was a process where we went through our assessment, we submitted that to the collaborative, we got comments back, we had multiple conference calls. I think Kathy was probably subjected to a couple of those. But it was a fairly long and iterative process that got us to the end to where we are now, and the end is that we are about 276 unique measures in this study, 70 residential, 92 commercial, 114 industrial. Fifty-eight of those measures are quote, unquote, new in the sense that our shop had not previously included those measures in any recent studies. The bulk of those are in commercial, but also a significant share in the residential sector.

Now I'm going to kind of briefly go over the main sources that we used for the residential, commercial, and industrial sectors. And there's, again, too much information on these slides for folks in the audience who don't have a handout. I apologize. I will just go over this quickly.

On the measure cost side for the residential sector, we used a lot of program data from FPL and other service territories. In Florida, we leveraged the California DEER database. DEER stands for the Database on Energy Efficient Resources, which is a multi-year multi-million dollar effort cofunded by the California PUC and the California Energy Commission. That is developing measure cost and savings data for hundreds of measures and keeping those. That has been updated, I think, four times since 2001.

We used ENERGY STAR® calculators for ENERGY STAR® related measures, and we also leveraged, to the extent possible, estimates produced by the Florida Solar Energy Center, particularly for some of these advanced shell measures like radiant barriers and sealed attic measures.

On the savings side, a lot of the same sources. For certain types of measures we were able to just use engineering calculations. For example, for savings from a change in fixture wattage from going from a T-12 to a T-8 fixture, for example, or a change from an energy factor of .8 to an energy factor -- of .6 to a .8 energy factor for a clothes washer, for example. Those are fairly straightforward.

For window measures, we used the RESFEN model, which is a fenestration model. RESFEN refers to residential fenestration, which is windows, which is a building simulation model that was built by Lawrence Berkeley National Lab. It is publicly available and very easy to use for estimating impacts from shading and advanced window measures. Again, we leveraged the DEER database, ENERGY STAR® product specs, and the TIAX study refers to the Curt Roth study on standby power for home electronics.

For measure saturations, the 2006 Home Energy Survey provided several key estimates of current measure saturation in Florida. We also used some program tracking data. There were some measure-specific, some measure saturation data available from the 2005 REC survey that had Florida-specific estimates. And, again, the saturation surveys done by Gulf and JEA over the past couple of years we were able to leverage to do some measure saturation estimates.

On the commercial side, a lot of the same sources. I think I will just point out the main differences. Actually these are all fairly similar. ADL refers to Arthur D. Little, which was the firm that Curt Roth worked for before it was acquired for TIAX, so the same author. Actually these are much the same sources on commercial.

Just skip right to industrial. For industrial measure data, most of the sources are, again, national sources. So primarily there are some energy efficiency market characterizations that were done by KEMA for the California IOUs circa 2001, 2003. Those data coupled with these long series of case studies, industrial case studies that were published by Lawrence Berkeley National Lab from '98 to approximately 2004, the market characterizations done by KEMA plus these industrial case studies done by LBL form kind of the lion's share of the measure cost and savings data that we leveraged in the potential study. There are some other key secondary sources, including the USDOE motor assessment and the USDOE compressed air market assessments.

So that gets us through the data development part of the presentation. It's 2:10, do -- just checking with the Commissioners, do you feel like you can keep going?

CHAIRMAN CARTER: Man, this is about as exciting as watching paint dry here. That was uncalled for, wasn't it?

Let's see if we have any questions from either the bench, or staff, or any of the parties that are here today. I guess Mr. Kelly as well.

You're it.

MR. TING: All right. So now we actually get to look at some results now that we have talked about --

CHAIRMAN CARTER: Oh, exciting stuff. Woohoo.

MR. TING: We get to look at some actual results. So, first, we are going to just go over the baseline, which is where a lot of the effort went. This is slightly cut off. So this just shows --

CHAIRMAN CARTER: I have a question.

MR. TING: Yes, go ahead.

CHAIRMAN CARTER: Michael and Michael, is that coincidental, or is it just y'all's stage name? Is that how you guys do it?

MR. RUFO: We spared you the last study we did. We have another Mike in our group, plus we had a Mike client. We published a paper at ACEEE with the four Mikes, so you guys have it easy today. You have only got two.

CHAIRMAN CARTER: Wow. I feel honored. Mike square. Okay.

MR. TING: Did you have a question?

CHAIRMAN CARTER: That was it. You missed it.

(Laughter.) You may proceed.

MR. TING: Okay. So here is a top-down look at the baseline. These are really some basic disaggregations. The chart on the left has the share of total sales, the in-scope total sales by utility service territory. FPL makes up a little more than half, Progress about a fifth, Tampa Electric about 11 percent, and everyone else right around 5 or 6 percent.

By sector, the residential customers make up more than half of the total sales in the seven utilities. Industrial, pretty small relative to other studies that we have done, 7 percent. These are the same type of chart by sector. This time it is just breaking down the summer coincident peak, the summer system peak, and the winter system peak, which are fairly close to each other. I think they flip-flop actually every year depending on the weather.

But, again, residential actually makes up a larger share of the summer peak and the winter peak. On the summer peak it is because of AC loads in the households. On the winter peak it is because of space heating and water heating loads in households. So that's probably stuff you have already seen before.

Here is our value added. So here is the picture. On the left this is the baseline for the residential sector. This is just in terms of annual sales, annual kWh. On the left is by building type, and this mostly reflects the structure of the residential customer base. So it's about three-quarters single family dwellings, and so energy consumption is almost 70 percent from single family homes, multi-family, 25. By end-use, heating, cooling, and ventilation, which is the HVAC, accounts for a little bit over a third of total annual sales, water heating about 13 percent, and lighting 12 percent, and then a whole slew of smaller end-uses.

I will point out that that other miscellaneous load is 8 percent. That's a load that is growing nationwide across the board.

CHAIRMAN CARTER: Michael, let me ask you a question.

MR. TING: Uh-huh.

CHAIRMAN CARTER: I notice with your residential you're saying that it's pretty fairly standard. In the context of the usage, is that standard as it is national?

MR. TING: The distribution of end-uses?

CHAIRMAN CARTER: Yes.

MR. TING: Is it is definitely kind of heavy on HVAC demand and sales, mostly because of the cooling loads are just almost year-round.

CHAIRMAN CARTER: Thank you.

MR. TING: And I just wanted to point out that what is referred to as plug loads generically, but that includes both other miscellaneous on this chart as well as the major electronics. We are just able to track TVs and DVDs and VCRs in that group separately from the rest of the plug loads, which is a growing part of the total end-use picture.

The next slide is the same end-use diagram for summer and winter peak. And here the story is pretty clear, on the summer peak, air conditioning is 68 percent of the total household peak demand. In the winter it says HVAC, it is actually all heating. And most of this is heat pump and resistance heating, so it's strip heaters, base board heaters, and residential heat pumps.

The only other thing that pops out is on the winter peak side the water heating load at winter peak is significantly higher than at summer peak. The winter peaks about 8:00 in the morning when water heating loads are ramping up, everyone taking their showers in the morning.

CHAIRMAN CARTER: Is that just the volume or the time?

MR. TING: It's the time of day. That happens to be coincident with when water heating loads are -- I don't know if it's the peak, actually, for water heating load, but it is certainly -- that's when everybody is doing it at the same time.

CHAIRMAN CARTER: Okay.

MR. TING: On the commercial side, again, the chart to the left is showing the breakdown of annual sales by building type, and on the right it is the breakdown of annual sales by end-use. The breakdown of sales by building type, again, largely reflects the distribution of floor area across the different building types. So office buildings make up a large share of total commercial floor area, and you see that in the breakout in their share of total sales.

On the end-use side, lighting and cooling make up the largest shares of total electricity consumption. The miscellaneous category actually includes space heating in the commercial analysis. It also includes things like compressed air, motors, process energy, so it's a bit of a mishmash. The heating load is actually fairly small within the miscellaneous category, but you will see later that it has -- commercial heating shows itself at winter peak, and that's about the only time when it becomes a significant end-use in the commercial sector. A lot of commercial buildings cool year-round. I think this one is probably cooling right now.

Here is the same breakdown of commercial end-use this time from the summer and winter peaks. Again, cooling takes up a large share, a larger share of summer peak demand than annual sales. Winter peak, again, as I mentioned, that miscellaneous piece of the pie on the winter peak is actually mostly space heating demand at winter peak. And the same is true actually with the ventilation piece of the puzzle. At winter peak some of that is related to heating demand.

Here is yet another breakout. This one is for the industrial sector.

CHAIRMAN CARTER: Let me ask you this now. You said that in Florida the industrial sector is smaller, but in the components of the industrial sector in Florida are they fairly consistent percentage-wise as they are in other states?

MR. TING: Yes. And the differences that you might see in the aggregate for the industrial sector in Florida has more to do with the mix of industrial activity that's in Florida rather than any difference between, say, a paper mill in Florida versus a paper mill in Washington. It has more to do with the mix of paper mills and electronics, factories and textiles and food production.

MR. RUFO: I would say the industrial mixes. You have got a lot of food production as you can see there. It is similar to California, whereas say in Texas you will see a lot of petroleum and chemical.

MR. TING: So on the left you can see that food production accounts for 17 percent of industrial sales, electronics and chemicals make up about 10 percent each, some paper and some minerals, stone-clay-glass. And the chart on right, again, has the end-use breakout. A lot of these are process end-uses on the industrial side, so you can see the process drives pumps, fans, process heating and cooling make up for significant shares, whereas the HVAC and lighting loads make up a relatively small share, about 20 percent, 21 percent over all.

Now, that changes quite a bit when we look at summer and winter peak for industrial customers, then HVAC and lighting account for the bigger -- well, HVAC accounts for a bigger share in the summer peak. It's interesting in the winter peak, the process drives and pumps make up significant shares, and we looked into this and it appears to be mostly scheduling of industrial processes as opposed to any weather-sensitive type of phenomenon.

That was a quick review of the baseline, and now we are going to roll through some of the results. And we are presenting all of these in the aggregate level, and if we want to drill down into more detail we can do that, but this is still quite a lot of information to digest.

CHAIRMAN CARTER: Questions, Commissioners, at this point?

Thank you. You may proceed.

MR. TING: So we are going to start with the residential sector, and up top is kind of the high level number. The tech potential estimate for residential energy savings is about 36,000 gigawatt hours. We'll show you how that relates to baseline demand in a little bit. The way that is shared out by building type is pretty consistent with kind of the overall share of single family versus multi-family dwellings in the state. Single family is 71 percent of total potential. By end-use is the chart on the right. This one does not really reflect a one-to-one relationship with where the baseline energy use is, and it's mostly reflective of kind of the difference in the level of energy efficiency opportunities that are available by end-use. So lighting accounts for a significant share, central air conditioning and heat pumps account for significant shares, water heating accounts for a very significant share of energy savings potential in the residential sector.

And these are, again, tech potential savings by end-use for summer and winter peak in the residential sector. Both of them are dominated by HVAC measures, and they are actually labeled, unfortunately, central AC, but that includes savings on the heating side in the winter peak. I apologize for the mislabeling.

MR. RUFO: It's really resistance heating.

MR. TING: Resistance heating, yes. And so the measures that are affecting that are both upgrades in the efficiency of the AC or heat pump, going from a 13 SEER standard efficiency all the way up to a 19 SEER central AC, or a 17 SEER heat pump, as well as a whole host of measures affecting the building envelope, advanced windows, double pane low e windows, ceiling insulation, sealed attics, wall insulation, a whole host of tune-up measures related to HVAC systems. And you see here while lighting accounts for 16 or 17 percent of the energy side, it accounts for a much smaller share for peak savings relative to the rest of tech potential.

This chart, this one is not going to be -- I don't think it's in the handout, the version that you guys got, I'm sorry, but we wanted to show this. This is the relative savings by end-use. By relative savings we mean this is the relationship between the level of tech potential that we estimated by end-use compared to its baseline energy use. So, within water heating, the total tech potential that we estimated for water heating measures on the energy side represents about 50 percent of baseline energy use. And on the peak side it is about -- summer peak is about 70 percent and winter peak is about 45 percent.

So the top line shows you where the total numbers are for the residential sector, and it's about, I think it's 38 percent on energy, about 41 percent on-peak, summer peak, and around 27 percent for winter peak. Again, I'll present that number at the end on a table, but this gives you an idea, and you can see how there is a lot of -- you know, by end-use there is a lot of potential in water heating, a lot of potential in lighting. A lot of that is CFLs. And the heat pumps and central AC, like I said, those are the high SEER units as well as a whole host of HVAC maintenance and building envelope measures, insulation, windows, et cetera. Appliances, there are a lot of ENERGY STAR® appliances, refrigerators, dishwashers, clothes washers. And the plug loads area again the ENERGY STAR® TVs and VCRs. So this is just to give a little bit more depth to the picture that you saw earlier.

Now, at the end of the day, all that analysis produces a supply curve. This is the supply curve for this study, although we cut off the Y axis at 50 cents, so it actually keeps going almost straight up after 50 cents there. But we didn't want to get the axes -- we wanted to make them readable. And this is just showing the results for this specific study. I think the real take away point is that CFLs are not only a significant part of the resource, but they are the cheapest part of the resource. So all of the cheapest, from a marginal cost perspective on the lower left-hand part of the axis, and as you move to the right the resource gets incrementally more expensive from a levelized costs dollar per kWh perspective. So this is, again, for energy. We also have supply curves for summer and winter peak demand.

On the commercial side. Again, on the left is technical potential for energy savings by building type. This does reflect, again, the kind of distribution of floor area. A lot of potential in the office sector, restaurant and services sector, and the retail sector.

The chart on the right is again by end-use. The lion's share of tech potential savings in the commercial sector are lighting. Mostly linear fluorescent lighting and cooling, this includes high-efficiency packaged units as well as high-efficiency chillers and other types of built up systems.

In terms of summer and winter peak, the technical potential in the summer peak is almost entirely lighting and cooling measures. On the winter peak, it says ventilation, that's actually mostly space heating savings on the commercial side. It's a ventilation measure, but they actually reduce heating loads, so a bit of a misnomer on that label. And the lighting share is high because lighting loads are high at 8:00 in the morning.

Again, here is another chart that you don't have in your handouts, but this is showing the same thing as we did for residential, and this is just the relative technical potential by end-use in the commercial sector. Again, the water heating, the relative potential in water heating is high, and that's mostly kind of the upper bounds of what solar hot water can provide, usually around 60 or 70 percent of load.

And the lighting savings on a relative basis are more modest than in the residential sector. In the residential sector the relative savings are mostly reflective of CFLs. In the commercial sector, it is mostly reflective of T-8s, which have a slightly lower savings percentage. CFLs typically save 60 or 70 percent relative to an incandescent bulb, whereas the high-efficiency T-8s might save on the order of like

30 percent. So this is, again, just to show how that potential, kind of the relative savings of the measures by end-use kind of stack up.

The top bar is kind of the bottom line for commercial sector. When you have energy savings potential of about 35 percent, I think, and a summer peak demand reduction potential of around 40 percent.

And this is the supply curve for the commercial sector. It is more dense than in the residential sector, and that is just because there are 11 building types and 100-odd measures per building type, so it gets a little dense. I think the take away from here is, again, a lot of the resource is on the lower part of the Y axis in terms of levelized costs, CFLs, fluorescent lighting, certain parts of the cooling measures, relatively low levelized costs per kWh saved. And this one is also cut off at 50 cents per kWh, so that one keeps going up and to the right.

And the industrial technical potential, again, the same story by end-use. It is fairly reflective of the end-use baseline consumption and demand. A lot of potential in pumps and compressed air, and a lot of opportunities in lighting, although lighting load in the industrial sector is fairly small.

The summer and winter peak breakout of tech potential in the industrial sector. Again, dominated by pumps. Lighting accounts for a significant share, and that just reflects the fact that lighting upgrades are readily available and applicable to much of the industrial market, even though it's a fairly small part of the baselines, but those opportunities are there in abundance.

This is, again, showing where, you know, the really significant opportunities just on an end-use by end-use perspective of pumps and compressed air. The lighting opportunities are also there, and these are again mostly fluorescent linear fixture type of measures, high-efficiency T-8s, high bay T-5s, which usually produce around 20 or 30 percent savings.

And the industrial supply curve. I'm just going to skip that one.

I'm going to bring this all back in terms of the total. The bottom line is about 58,000 gigawatt hours is our estimate of tech potential for energy savings amongst all three sectors across all seven utilities. By utility it's distributed almost identical to their share of load. By building type it's also fairly reflective of the distribution of residential, commercial, and industrial, although I think commercial accounts for a slightly larger share of potential than it does for baseline energy.

The same picture both by summer and winter peak. And this, again, is largely reflective of the share between residential and industrial and commercial on-peak.

There is the table that kind of sums up all of those high level numbers. Across all three sectors our estimate of the total technical potential for energy savings is about 34 percent of current sales. I'm sorry, you don't have this one in your handout either. About 34 percent of total sales, that's from an energy perspective. Summer peak tech potential of about 40 percent and winter peak tech potential of about 28 percent. There's a little bit of variation in these relative savings across the utility service territories, but fairly consistent.

And so those are the full set of high level results, and we just have a couple of slides to kind of wrap up this part of the presentation. In terms of kind of contextualizing these results relative to everything that we've learned about consumption and demand in Florida, the results reflect a couple of key aspects of baseline consumption and demand in the Florida utilities.

In the residential sector, it is nearly an all-electric baseline in Florida, meaning the gas share on the heating side is almost insignificant outside of Gulf Power's service territory. So we're talking in the order of 95 or 98 percent all-electric systems for heating, cooling, and water heating. That factor reflects itself in the results.

Another aspect of the results that's important to take note of is that the measure list itself was fairly heavy on HVAC measures, and so that also accounts for kind of the large relative potential you see for HVAC measures particularly for on-peak potential in summer and winter peak savings.

I think in general, at a higher level than those two previous points is that the measure list, the scope of the measure list was pretty wide for this study. It was pretty ambitious. It certainly cast a wide net on the efficiency side. I mentioned these technologies previously, SEER 19 AC units, SEER 17 heat pumps, some advanced geothermal heat pumps, and some other systems. It's likely that those advanced technologies are going to face some near-term constraints in terms of their supply from a manufacturing and distribution and contractor perspective, and that is just a caveat to understand as we move forward with the study.

We wanted to briefly mention uncertainty. There is uncertainty associated with all of these studies no matter how well they are done. It is an inevitable truth. I mean, there is kind of three basic sources of uncertainty. It's in the baseline data, the measure data, and in any type of forecasted data. Forecast data refers to change in the customer base going forward.

We are not quite sure how things are going to evolve going forward in terms of end-use consumption and the demand for energy services. Plug loads was one example that I mentioned earlier, so that is an example of uncertainty in forecasting.

In this study we were able to leverage a tremendous amount of primary data, particularly for the baseline analysis. So in that respect the relative uncertainty in the baseline data for this study is likely to be a lot lower than any recent study that we've done with this Itron/KEMA team. And so, you know, it took a lot of manhours to be able to work through all the primary data, but the payoff is that the certainty surrounding the baseline is pretty good, and it's noteworthy for this effort.

So that said, that was what we had prepared for the energy efficiency potential analysis. What's left is to talk about the demand response piece, which is about 10 or 12 slides.

CHAIRMAN CARTER: Hang on a sec, Mike. Cool your jets for a second.

Let's do this. We have been going for a couple of hours. Let's give the court reporter a break, Commissioners, and we'll come back in about ten minutes. We're on recess.

(Recess.)

CHAIRMAN CARTER: We are back on the record. And when we left, we were getting ready to get into the technical potential for peak savings from demand response.

Mike, you're on the air.

MR. RUFO: Go ahead to the next slide. Okay, that's me.

We'll talk about demand response. Here is a recent FERC definition. Changes in electric usage by end-use customers from normal consumption patterns in response to changes in the price of electricity over time, or to incentive payments designed to induce lower electricity use at times of high wholesale market prices or when system reliability is jeopardized. That's a definition.

Demand response has many different faces, many different elements. This is a NERC characterization, and over here we see this demand response broken up into dispatchable and non-dispatchable elements. And under the dispatchable you see controllable, direct load control there on the left. And in the non-dispatchable area we have pricing elements. You know, demand response is really a continuum of a lot of different kinds of programs from interruptible programs for large industrial to time-of-use pricing and everything in between.

In the work that we have been doing so far, we have been focusing on direct load control, critical peak pricing with control technologies, and pricing time-of-use. I think really a little bit more on the critical peak pricing side with time-of-use an underlying aspect of the critical peak pricing.

So just some conceptual issues between energy efficiency and demand response. Energy efficiency is sort of a one stop, not really, but in this simple overview. The customer adopts the technology or they don't. Oftentimes in DR you have got this two-step process where step one is participation in a program enrollment and step two is actually taking an action as part of that program. So it's not always the case that folks who enroll in the programs take action, or take equivalent actions, or take even the same actions from one demand response event to another. So it's a bit more variable.

Cost and benefits. Demand response is really a function of customer behavior, which is in response to some kind of economic signal. So, you know, technical potential for demand response is sort of an odd concept because the whole nature of demand response is really as an economic resource. It's a willingness to play for pay. You could say the technical potential for demand response could be 100 percent of load, right? How much are you willing to pay me to reduce my load. You know, for the right price, you know, if you'll pay me more than I make in my every day business, I'll turn it all off. But it gets a little bit absurd at those kind of prices.

So this concept of technical potential for demand response is a little bit tricky. It's really an interim step, again, on the way to estimating program potential. And in this case even more than the energy efficiency, some assumptions have to be made at this step that are, you know, probably moving us towards the achievable side of the spectrum.

So how are we looking at DR? We are looking at DR in these three kind of bundles. Communication technology, how the messaging and information is carried to and from the customer, so some of the different ways to do that are full scale advanced metering infrastructure systems, two-way AMR systems, one-way AMR systems, one-way just stand alone direct load control systems. So this was sort of a utility communication backbone element of the process.

And then once you are at the customer's site, then you have a set of customer infrastructure technologies that come into play. So they are the switches for cycling, or shedding space heating or cooling, so-called smart thermostats, other types of automated energy management systems, and such that can turn off or shed load in response to a price signal, or to just an event signal.

And then you have the economic part of it, what's the motivation for the customer, whereas what is the price signal, where is the incentive or the rate of return being generated. Is it from an incentive program or is it embedded in the inner price signal. And the price signals themselves are programs. You can have demand response effects with no enabling technologies, simply with prices. And what we are doing in this analysis is we are interacting these things to try to capture the whole spectrum of how the synergy between all of those elements, because they are synergistic, the pricing and the infrastructure.

So the engineering approach that we talked about with the bottom-up analysis of energy efficiency, it's analog here in our DR analysis. It's looking at the availability and roll out and timing of when different communication networks might be available, as well as when these customer, the trajectories of penetration of some of these customer enabling technologies, when they might be available to capture potential.

The economic potential when we get there and the achievable will be a function of the economics from the customer and the utility's perspective, and we'll take into account like we will on the energy efficiency side other factors that come into play that influence customer adoption, besides just, you know, the direct economics, the satisfaction with the technologies.

CHAIRMAN CARTER: Mike, let me ask you a question.

Is there a break point to where you get maximum participation, and then a break point where people say, you know, going back to your pay to play technologies, is there a break point to where on an incline basis, because the economic variables do provide incentives for that, but then you get to a point of diminishing return where you have kind of captured all that you can get from that. Is there kind of a break point for that, or is that not part of what you did?

MR. RUFO: Well, when we get to the achievable part, we'll be looking at those kinds of trade-offs on demand and supply curves.

CHAIRMAN CARTER: If I forget it, would you remind me at that time?

MR. RUFO: Yes. I mean, at this stage we are just doing the technical, so I don't know when the -- I guess sometime in the spring they will be --

CHAIRMAN CARTER: 1492. We'll do it again in 1492.

MR. RUFO: Well, my understanding is after we get through this technical, then we will do the achievable and the economic. But we could talk about that a little bit today. We are happy to -- I think, hopefully we are going to wrap up here soon, and we will have some extra time, and we can move into some of those achievable methodologies and issues. Which, you know, that is really where the rubber is going to meet the road with all of this is when we start talking about, well, what are customers going to do in response to all of this stuff.

So there's another way of looking at demand response it just strictly from a price elasticity point of view. There is a lot of econometric analysis that has been done about price elasticity and you can calculate the price elasticity effects of these alternative, you know, rate structures. But, you know, econometric analysis that look backward are limited, too, because they are based on the infrastructure and technologies of the past. And what we want to do is kind of leverage the useful information on price elasticity, but marry it to some reasonably -- you know, some meaningful forecasts of changes in technology infrastructure.

So here is just, again, an analog to the equation that we put up before for energy efficiency. You know, pretty similar. You have got your number of households, you have got the saturation of the end-use that you are trying to estimate potential for. Let's say cooling, or whatever it may be. You have got the base demand, peak demand for that end-use or equipment that you're targeting your program around, and then you have got the demand response. That's all on the baseline side.

On the DR side you have got what percent of the market is tied to a particular communication network already, or might have that network rolled out to them over some reasonable time period. What percent of the market, you know, has the choice of particular types of pricing options; what's the customer DR technology penetration rate, so what percent of the customers already have energy management systems or will have energy management systems in five or ten years; and then what's the percent savings associated with those price signals and enabling technology combinations.

So there are a lot of issues that underlie forecasts of demand response potential. We would like to kind of do the

DR work. The same with the energy efficiency, but maybe even more so here as kind of a scenario analysis. So we have developed some initial straw-man values, the Itron team has, and has been getting feedback from the collaborative on those values. And then we want to frame a high and a low forecast of DR potential under a set of different assumptions about the future.

So the work in progress, or the draft technical potential, DR results we have here, we're looking at the potential ten years out. So the reason that we're doing that is to -- in the final analysis we'll show the potential year-by-year, but for today we wanted to just show the end-year potential after some of these infrastructures would have had more time to roll out.

So here are some of the kinds of control technologies that we're looking at so far. Residential space cooling and heating switches for cycling and shedding, smart thermostats. In-home displays, those are displays of -- realtime displays of consumption that can sometimes affect -- there's a number of pilot studies showing that consumers having access to realtime information instead of just monthly bills on their consumption will help them learn how to manage their energy use better.

We've got switching technologies for water heating and pool systems. In the commercial and industrial there is automated control and direct control for HVAC as well as lighting and nonprocess loads. You know, one of the big issues with demand response technologies is, you know, the extent to which customers are willing to allow their equipment to be shed or cycled and how noticeable that would be. So there has been a fair amount of work over the last five years in the C&I sector trying to develop automated demand response technologies that try to be as invisible as possible to the end-user so that the shedding that's taking place is very distributed and strategic and done in such a way that it's not that the customer suddenly feels a big loss of energy service.

But there are some customers who are, you know, likely going to have concerns about any automated third-party kind of demand response. And if you are in an industrial setting and you are manufacturing a sensitive piece of equipment, you are probably -- it's going to take a long time, if ever, that you are going to get comfortable with a third-party automatically, you know, shutting down your batch processing.

However, you may be willing and have procedures in place to do that yourself in response to a particular price signal. So, again, there is a whole spectrum here between, you know, very automated type of impact and an impact that's fully controlled by the customer and varies from time to time in response to their trade-off between the price signal and their own production.

So, again, on the critical peak pricing, we looked at two scenarios, a high scenario and a low scenario, representing different levels of market penetration and availability of dynamic pricing tariffs. So this shows a few of the underlying assumptions in the estimates so far. These are the percent of the applicable load associated with different end-uses in the residential and nonresidential sectors and then with the different types of control technologies.

So you can see in the first cell there that's saying that 20 percent of the residential customers would be on some kind of direct cycling strategy for their HVAC equipment. In the commercial sector, 60 percent would be on some kind of automated control strategy.

In the residential you can see there's competition in the HVAC side. There's, you know, direct cycling, turning off the air conditioner, there's shedding, just reducing the cycling time for the air conditioner, and then there's the smart thermostat, which does something similar, but it just -- it floats the temperature from the customer's set point a few degrees. But they all accomplish the same thing, it's just different ways of doing the same thing, although the level of savings can typically vary.

So from those estimates, in addition to the infrastructure penetration estimates, which were on the last slide, these are the initial estimates of what the peak load reduction opportunities are for each of these different combinations of end-uses and control strategy.

As far as the different types, now here is how we then start to combine those control strategies with the pricing, so you can see the cycling and the shedding doesn't require any special tariff, so you can do those with the flat rate tariffs that are out there by and large for most customers already. The smart thermostats are typically combined with a critical peak pricing kind of program, so the incentive for the customer is embedded in the price signal, so their willingness to let that temperature float a little bit is in exchange to their motivation to reduce that critical peak price effect. The same thing for the water heating and the other preset control strategies.

Automated control in the commercial sector similarly tying that to critical peak pricing, because the price is its own incentive for the customer to develop these custom strategies, the ones that work best for that individual customer, and that also creates a natural market for third-party providers once that price signal is there. The customer then has an incentive to reduce that on-peak cost and that provides a natural price signal for them to work with energy service companies or utilities, you know, whoever it may object to come in and provide advanced energy management and information systems that can be used to provide this reduction in peak load in direct response to pricing, often in an automatic way built into the software that does the building automation.

This shows the initial distribution of customer load on these various tariffs. So most of the residential and the low penetration scenario for the pricing options -- is that in their packet? Yes. Most of the customers remain on the flat rate, 90 percent on the flat rate and only 10 percent on the dynamic critical peak pricing rate. In the high penetration scenario, it goes to 50/50 for residential and 65/35 for the nonresidential. And, you know, these are assumptions that are easy to change. We could pretty easily do more than two scenarios on demand response varying these assumptions accordingly.

So when you interact all of that information and assumptions, and estimates of base load and infrastructure penetration, and enabling technology, and tariff distributions, these are the initial estimates we're coming up with for DR potential for each of the utilities for summer and winter, and we'll get to on a relative basis.

Then this shows for each utility how that potential is breaking down among these different combinations of technology, enabling technologies and tariffs. So you can see there for FPL, most of the potential is in the AC cycling and shedding with the flat rate, and I believe a lot of that potential is already captured unless this is incremental. Yes, this is not incremental, so those programs are the largest in the country as far as I know. So most of that potential there is already captured, but then some of the other potential that is incremental, there's smart thermostats with critical peak pricing, and some of the other CPP potentials.

On the C&I side, most of the potential showing up under the automated control rather than the direct load control. C&I is not a great application for direct load control. You know, there are some applications there, but not a lot. Most of the applications are going to be in these automated customized control where the customer figures out what they want to shed when and they program that themselves in response to the price signal.

So from this initial set of assumptions we're seeing a peak demand potential reduction of 5 to 6.5 percent under those two, that range of scenarios. Most of the potential in the cooling and heating, which is where most of the baseload is.

Some the caveats on where we are at so far -- and this work is not as far along as the energy efficiency work is, but it's picking up speed. But some of the caveats special to DR are that we have not yet incorporated the use of on-site generation as another way of responding to DR events or price signals, so that's something that can be done, I think we are planning to do. So a number of customers have backup generation.

Now in some jurisdictions you have got to make sure that you only enable that backup generation to run, obviously, within whatever constraints there might be on the running of those units with respect to any pollutants, criteria pollutants in particular basins and such. I'm not positive myself. Do you know if we have those kind of constraints? I don't know that there are any.

The DR potential that we have here is not including the current large C&I interruptible programs yet and we need to roll that in. The direct load for C&I assumes a 10 percent reduction in peak demand. I think the other things here we have already gone through what those assumptions are. You know, there is certainly a lot of uncertainty about how these technology infrastructures both on the utility backbone side and on the customer side may or may not roll out over the next ten years. You know, it's a little bit of a chicken and an egg, because that's the thing that, you know, you want to direct your policy objectives around.

But unlike energy efficiency -- there's a natural market for energy efficiency that's out there every day, right, there's all of this equipment that's for sale. With demand response, the potential is very tied to the types of tariffs and price signals that customers face, and the technologies will -- there's some tariffs that are enabled by technologies and there are some technologies that are enabled by the pricing. So it's much more interactive and driven by policy, I think, even than the energy efficiency. There's more of a natural market for energy efficiency than there is for demand response at this point.

That's pretty much it on where we are at with the DR so far, and that's the end of our planned slides. We have backup slides and are available to take questions on anything that we have covered today.

CHAIRMAN CARTER: Thank you.

Also, staff, just make sure that we get a complete set of all the slides to all the Commissioners' offices.

MS. LEWIS: Yes, Chairman, we'll have those slides placed in the docket file, and we'll get a copy to your office.

CHAIRMAN CARTER: Okay. Commissioners, questions at this point?

Commissioner Skop, you're recognized, sir.

COMMISSIONER SKOP: Thank you, Mr. Chairman.

Just a quick question with respect to Slides 67 through 70, and I apologize if they don't exactly match the presentation, because I seem to be having some page problems. But on Page 67 on my book, the slide was entitled DR technology and applicable tariff in 2018, and it lists the various DR control technologies and the respective proposed tariff.

And in terms of looking at the results on the follow-on pages, would it be correct to understand that the most potential exists in terms of the demand reduction that would be AC load shedding and AC cycling?

MR. RUFO: Yes, that's what we are showing so far.

COMMISSIONER SKOP: Okay. And with respect to having the smart metering infrastructure where it would -- or smart thermostats which would allow the consumer to override settings and turn on the AC, or program those appliances or air conditionings accordingly due to critical peak pricing or pricing signals, that would also facilitate the demand-side reduction?

MR. RUFO: Yes.

COMMISSIONER SKOP: And just one more follow-up question. In terms of implementing those areas on a forward-going basis, and I know this is just a potential study, but I just wanted to get your thoughts and feelings with respect to a mechanism for implementing those type of demand-side reduction initiatives. I know some of our utilities or IOUs currently do that in terms of load shedding on a voluntary basis, and I think that's a great thing, but for that to continue would it be appropriate to, perhaps for new construction, to require some sort of load shedding be installed within the building code, or so forth and so on to kind of leverage and take greater advantage of those demand-side reduction technologies not only for the benefit of the utilities, but for consumers?

MR. RUFO: Well, I think with respect to new construction, you know, that's the classic lost opportunity potential area with respect to, you know, any technologies of interest from a public policy point of view. So we talk about lost opportunities in new construction a lot in energy efficiency, and now people are starting to talk about that more with respect to things like demand response and PV for that matter. You know, anything where there is an opportunity for -- where it's going to be a lot less expensive to install the technology or the infrastructure at the time of construction than it will be to go back five or ten years later and retrofit it. So I think that like some of the other opportunities, there are costs saving opportunities to incorporate these things, you know, right out of the gate in new construction, and that there would be benefits for utilities and consumers.

That begs a little bit of the question of, you know, timing, when that infrastructure would be -- if you weren't rolling out that infrastructure territory wide, you know, at some point you still need to integrate it with your overall strategy for your customer class.

COMMISSIONER SKOP: Thank you.

Just as a follow-up to that, I understand that with respect to new construction, some of the technologies listed on Page 67 such as the advanced smart metering and other electronic load controls and various wizardry, you know, certainly would drive costs, but I guess I was looking at it as low-hanging fruit.

I know that for demand-side reduction that the utilities currently are able to install those controls on AC and so forth and retrofit rather easily, so to me the cost would not seem to be substantial for those type of technologies. And I guess I was looking just as a first order of magnitude whether doing that on a preconstruction type of thing would have value in terms of providing a benefit. But, again, not resulting in a substantial cost because, again, that type of technology is readily implemented and immediately available.

MR. RUFO: I think there is definitely a cost reduction opportunity there.

COMMISSIONER SKOP: Thank you.

CHAIRMAN CARTER: Thank you.

Commissioners, anything further? Staff. Any questions from staff? Any questions from the participants?

Thank you so kindly. I do appreciate the perspective that you presented on both DSM as well as the energy efficiency. Very thorough. Thank you.

MR. RUFO: Thank you.

CHAIRMAN CARTER: Ms. Clark, good afternoon.

MS. CLARK: Good afternoon. Thank you, Mr. Chairman.

I only have four slides, and I think you'll get them loaded in here pretty shortly.

I'm here on behalf of the seven FEECA utilities which were listed in the Itron study, and you'll be happy to know our presentation is very brief. I'm just here to give you an overview of where we are in the next step of the goal-setting process, and that is the status of the development of the economic and achievable potential for the demand-side management.

CHAIRMAN CARTER: We'll take a little break. I thought we could kind of schmooze on into it. We're on break for seven minutes.

(Recess.)

CHAIRMAN CARTER: We are back on the record.

MS. CLARK: Mr. Chairman, if I can digress from the presentation for just a minute.

CHAIRMAN CARTER: Digression is always appreciated, particularly at a time like this.

MS. CLARK: Well, I had two things I wanted to ask, and ask for confirmation from the two Mikes from Itron.

First of all, as I understand it the study is not final, so the numbers in there are not final. That will be part of your final draft. Would that be correct?

MR. RUFO: Correct.

MS. CLARK: The other thing is the numbers that you gave on the demand response, that represents total numbers which include current programs, is that correct?

MR. RUFO: It includes the AC control, but not the large interruptible programs.

MS. CLARK: So we just wanted you to be aware of that when you are looking at the numbers in this draft report.

CHAIRMAN CARTER: You may proceed.

MS. CLARK: Well, I'm here to give you sort of the status of where we are on the next step, which is the development of the economic and achievable potential for demand-side management.

The memorandum of understanding that was used for the technical study has been amended now to address economic and achievable potential. All the parties have agreed to the amended MOU, and we are in the process of getting signatures.

The parties are working on the statement of work to be done for the study, which should be finalized by this Friday. Based on the scope of work, we estimate the development of the economic potential will be done in January, with the achievable done in April, and then the utilities will finalize their DSM goals and start to prepare their goals petitions by May. Starting in May, excuse me.

The utilities plan to use the results of the technical potential study to determine the achievable potential. As I indicated to you last workshop, this is a multi-step time consuming process and we think by continuing the existing collaborative and working through this process, we believe it will be less contentious at the back end, and we are hopeful that that will be the case.

However, by using a collaborative process, it has and will impact the time required to complete the various studies. As the gentleman from Itron indicated, it has been a comprehensive study and they have had multiple conference calls to work on a consensus. And reaching a consensus certainly takes time, but we think it pays dividends by getting everyone on board as we move through the process.

Now, next to each of the activities we have indicated the time we anticipate it will take to complete each one. The first step is to determine a supply resource plan with no DSM beyond 2009. This becomes the basis for determining when the generation needs are that the DSM will be compared to in determining cost-effectiveness. Once the supply plan has been determined, the economic potential is then developed. This involves determining which DSM measures are cost-effective when compared to the supply side alternatives.

The outcome of the economic potential analysis is a set of measures that are cost-effective under each of the Commission-approved cost-effectiveness tests. This provides the input into the achievable analysis. This flow chart shows the achievable potential analysis being done for the two existing Commission-approved cost-effectiveness tests in combination with the participant test. Those two tests are the Rate Impact Measure test and the Total Resource Cost test. These are key to determining participant levels which are key inputs in the achievable potential analysis.

At the completion of the achievable potential analysis, the individual portfolios are then compared to the supply plan. And then the last step in the flow chart shows the actual preparation of the utilities' goals.

The date you have on this flow chart is consistent with what we requested at the November 3rd workshop. We have since talked to staff and been given information about their proposed schedule for getting the goals done and in effect by 2010. We understand that they could be comfortable with a June 15th filing for the goals, and I have indicated to staff that the utilities could as well be comfortable with that June 15th deadline for filing. I think that's a Monday.

CHAIRMAN CARTER: Staff, just kind of give us a layout of the schedule, please.

MS. FLEMING: As far as a layout, would you like all the dates or just the utility filing date? Because I believe initially the utilities were requesting a July 1st date which would entail moving the hearing to a month later. Currently we have hold dates in August, and that would require moving the hearing to September. However, the Commission calendar doesn't have any availability for a hearing of this nature in September.

What we are comfortable with, based on the schedule, with keeping the August hearing dates is to allocate -- allow the utilities to file June 15th. Staff's initial proposal was May 1st, and so we feel that the June 15th date is a good compromise, and that should work for all parties involved, including staff.

CHAIRMAN CARTER: And that would work -- that's consistent with maintaining our current schedule as well as being able to get things done?

MS. FLEMING: That's correct. With keeping the hearing tentatively scheduled where it is in August, that will afford an ample time for briefs as well as for staff to file its post-hearing recommendation and have the order issued by the end of the year.

CHAIRMAN CARTER: Okay.

Ms. Brownless, good afternoon. How are you?

MS. BROWNLESS: Fine, thank you. I'm Suzanne Brownless here for the Florida Solar Coalition. We have filed our intervention in these dockets today, Chairman. And if I can understand, the June 15th date is the date that all testimony and goals will be filed, is that correct?

MS. FLEMING: That is the date for the utilities' direct testimony and goals, that's correct. There will be separate dates for the intervenor as well as for staff testimony, which will be -- we have those, but I would feel more comfortable putting those in an OEP.

CHAIRMAN CARTER: Okay.

MS. BROWNLESS: And then the hearing date would be -- the tentative hearing date is when?

MS. FLEMING: The current hold date is August 24th, the week of August 24th.

MS. BROWNLESS: So all parties would be conducting discovery based upon the final testimony in a little bit more than a month, 45 days, is that correct under the current schedule?

MS. FLEMING: That is correct. However, staff has already sent out discovery based on the utilities' information, so parties are not precluded from sending out discovery as of today.

MS. BROWNLESS: Thank you.

And as to that point, as I say, we did file our petition for intervention today and that will be provided to all the parties today electronically as well as by mail.

I know that the Southern Alliance for Clean Energy also has a pending petition for intervention. I don't know if the utilities will object or not. Of course that's their prerogative, and they have ten days in which to do so. But if we could get our interventions ruled upon quickly after the ten days passes, then we would have the ability to ask our interrogatories and do our discovery now. And if that comes to pass, that's great, and I can live with the schedule.

I think without a formal order granting my intervention, the utilities would be legitimately -- would be able to legitimately say that they didn't wish to honor any discovery that we put out ahead of time. So that's my only concern.

CHAIRMAN CARTER: Okay. We will govern ourselves accordingly with the dates that staff has given us, and with all deliberate speed we will make things happen.

Staff, anything further?

MS. FLEMING: I believe with respect to -- as far as the dates, staff will now -- with the consensus of the parties, staff will move forward with the OEP and set forth all those dates so all parties are on notice as quickly as possible.

CHAIRMAN CARTER: Okay. Ms. Clark, did I cut you off?

MS. CLARK: No. She has covered the dates, and we understand what they might be tentatively, and that the hearing date is tentatively -- I guess it is the last week in August, so we believe we can work with that.

CHAIRMAN CARTER: Staff, any procedural matters or closing matters, concluding matters? Hang on a second.

Commissioners, is there anything further? Thank you.

Staff, any concluding matters, closing matters, or --

MS. FLEMING: Well, with respect to any procedural matters, if any party would like to file any post-workshop comments, we ask that they be filed by December 29th.

CHAIRMAN CARTER: Okay.

MS. FLEMING: And that's all we have.

CHAIRMAN CARTER: Okay. And you have already -- all of you have been given the dates and all like that, and we'll look at whatever pretrial orders that we need to deal with.

Staff, just get with the prehearing officer and all things are possible. It's the holiday season.

Anything further, Commissioners? Staff?

Hearing none, we are adjourned.

MS. CLARK: Thank you, Mr. Chairman.

(The workshop concluded at 3:52 p.m.)

STATE OF FLORIDA)

: CERTIFICATE OF REPORTER

COUNTY OF LEON)

I, JANE FAUROT, RPR, Chief, Hearing Reporter Services Section, FPSC Division of Commission Clerk, do hereby certify that the foregoing proceeding was heard at the time and place herein stated.

IT IS FURTHER CERTIFIED that I stenographically reported the said proceedings; that the same has been transcribed under my direct supervision; and that this transcript constitutes a true transcription of my notes of said proceedings.

I FURTHER CERTIFY that I am not a relative, employee, attorney or counsel of any of the parties, nor am I a relative or employee of any of the parties' attorney or counsel connected with the action, nor am I financially interested in the action.

DATED THIS 23rd day of December, 2008.

Ruth McGill / for

JANE FAUROT, RPR
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