

Duquesne Light Act 129 Demand Response Subgroup Meeting – April 21, 2009

There were presentations being handed out for those here today so please get one. I would like to let the folks know on the phone that all presentations will be posted on our web site at: www.duquesnelight.com, go to the bottom right hand side of our web site there's an act 129 section, click on that and you'll find all of the presentations as I said on Friday.

I would like to take roll call as well in a moment but first of all I would like to say how important it is for participation today. We are beginning or involved in a process of creating energy efficiency in demand response programs that will hopefully change the face of our customer base for years to come. For this to be successful I need every one of you here and on the phone to provide your thoughts and insights so we can work together to make this a success.

So we'd like to do the roll call first on the phone please.

Good morning this is Pam Polochek on behalf of the Duquesne Industrial Interveners.

Alright thank you I'd like to go around the room please and I'll start to my right.

Cindy Menhorn -- I'm with MCR Performance Solutions.

Tom Brooks with MCR Performance Solutions -- I head up their energy efficiency policy.

Colleen Mackin -- I represent the residential customers, I'm part of the Duquesne Light Act 129 team.

Barry Kukovich -- I'm in customer care for the Duquesne Light.

Sandy Phu, with the VA Medical Center.

Ed Johnstonbaugh with the Westmoreland County Cooperative Extension at Penn State University.

Michael Jones with Transdec Technologies -- we represent solar energy.

Steve Moritz, with the Plan Consulting Group -- we're an energy efficiency and energy management consulting group.

John Choma, Energy Connect

Gene Ameduri, ENERLOGICS Networks

Chris Smith with Energy Technologies Group.

Dave Defide with Conservation Consultants Inc.

Fred Sargent of Sargent Electric

Richard Taylor with Imbue Technology Solutions -- we provide energy efficient lighting products and services.

Lynda Pekarsky with Duquesne Light

Ruth Delost, director of information technology metering and field operations at Duquesne Light.

Thank you everyone and I'd like to introduce Cindy Menhorn for MCR.

Demand Response Subgroup Meeting (continued)

Good morning everybody. What we'd like to do is we would like to talk about the demand response component of our Act 129 filing requirements and I'd like to give you a short review. If you were at our initial kick off stakeholders meeting, some of this will be repetition but I apologize for that but I think it's important enough that we'll just hit the high points once again.

We have set up the sub group meetings in a general session and a breakout session. We're going to talk a little bit more about what those breakout sessions will really entail so this is a work in programs kind of development of the subgroups, how we want to handle things, how we want to move forward with our programs. But I can't emphasize enough the importance of what Michele said, we really need your input, we really want your input, we welcome your input.

All right, so just a recap of the goals we have the requirement of achievement of 1% reduction in consumption within this service territory by May 31st of 2011, which ramps up to 3% by 2013. Now this is measured against a forecast ending May 2010 and that has been approved by the Pennsylvania PUC so we know our baseline and the numbers by which that has to be impacted are the 140,885,000 kilowatt hours in 2011 and 423 million kilowatt hours in 2013. Now that's on the energy side of the business. On the demand side of the business the reduction goal is 4.5% and that is by May 31 of 2013 within the service territory. Now that's measured against a June through September average of the hundred peak hours. So the target for demand reduction is 113 megawatts. Now included in the requirements of the act would be a 10% reduction coming from the government municipalities, educational and non-profit accounts.

Question: These percentages, are they across the state, does every utility have the same requirement or is it unique to Duquesne Light?

No every utility that has 100,000 customers or more is required to meet those percentages based on their forecasted numbers. So obviously the numbers are different but they have the same 1%, 3% and 4.5% if you have 100,000 customers.

All right now where does the funding come from? And this is real important to all customer classes but and this is something else that goes across to that last question, all of the EDCs. The EDCs are permitted to spend 2% of their total retail revenue from 2006 to use as revenue to implement the programs. Now for Duquesne that equates to a little under \$20 million per program year. The EDCs are in fact allowed to recover those dollars through the customer classes. Now how that happens is the customer classes are designed, the recovery mechanisms within the customer classes has to be related to the programs within that class. So in other words, a residential class won't be paying for an industrial program and an industrial program won't be paying for a residential program. Duquesne already has a team in place to look at the stimulus dollars to see if there's any applicability to those dollars that are coming out of the

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stimulus package that can be used for energy efficiency and demand response programs.

Alright. What programs qualify for inclusion in the plan? Well the PUC has dictated that as well. That programs that are part of this Act 129 filing requirement must pass what's called a total resource cost test and the- Larry and Tom will speak to that somewhat later in the presentations or the breakout sessions as to the components of those. If you aren't familiar with that those total re-re-cost tests please let us know and we will get into more details on that. The test includes all expenditures and what happens is the way the plan will work out is we'll optimize the available funding to achieve the greatest energy in peak demand savings. Duquesne hired MCR to work with them and their team on development of the potential that is out there. And this slide represents the potential energy efficiency and demand savings related to the forecast in the different customer sectors that are out there. If you look clear to the left there's a TRC value out there that speaks to the fact that the programs that are included in here that are just kind of very, very, very high level programs, meet the TRC test. Then you can see at the bottom where the achievable kilowatt hour and the 1% that is necessary to comply with the act is in fact met. Keep in mind there are some program descriptions in these presentations but they are merely put out there to facilitate discussion with all of you in terms of we looked at the potential, saw some programs that sort of made sense but obviously through collaboration with you they will be refined to a greater extent. So if you see something here don't be alarmed that it's a program that we have said we will implement, that's not the case. We put these out here to facilitate discussion.

With that I'm going to turn it over to Larry Barrett and he's going to walk you through the next few slides and determine how best we can facilitate discussion so that we have the best use of our time. Thank you.

Thank you Cindy. Good morning, my name is Larry Barrett and hopefully everybody can hear me here, I think that's pretty clear they can wave hands and if on the telephone you can't hear me let me know. I'm pleased to be here for several reasons. One is it's nice to see some familiar faces in the audience who I've known for many years and in many cases decades I suppose. Secondly I'm a native of these parts, although I don't live here now. I grew up in Ellwood City, Pennsylvania, some people may know that that's between New Castle and Beaver Falls. We're really not very well known except when I was in high school our football team almost beat a Beaver Falls football team led by a guy named Joe Namath who is very famous in these parts. Most of in the room I think are old enough to remember Joe Namath, a lot of people don't know who that is. And on the basis of that near victory and his only loss in high school, half of our football team got scholarships to play at schools other than Alabama. Nobody ever heard anymore from the Ellwood City football players, but we heard a lot more from that Beaver Falls football player.

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I'm here to represent MCR Performance Solutions and the work we've done to tee up if you will some discussion on demand response and so I'm going to proceed in roughly two parts. One is to give you an overview of demand response, although there are some real experts in this audience that I know are quite familiar with this topic. Then second, we've put together some programs for discussion purposes. It's the first point- and I'm going to read these slides since people on the telephone do not have a presentation, so I hope the folks in the audience here will bear with me as I read through most of the bullet points. But the first point that we make is that the Pennsylvania PUC requires that a demand reduction program be offered in each customer class and we define that as a residential class, commercial class, and industrial class and you'll see how we've done that later on.

Demand response includes 2 types of programs. There's all kinds of catechisms as to how you can divide these programs up. FERC; Federal Energy Regulatory Commission, positions them or categorizes them into 2 parts. One is they call it incentive based programs and the other is time based rates and they sound familiar but they're really quite different. Incentive based programs as we say on the slide here, refer to things like direct load control for air conditioners, residential homes, demand bidding where customers bid into the marketplace on an economic dispatch kind of an arrangement. Interruptible which some people make a distinction between interruptible rate programs, interruptible programs and curtailable load programs and capacity markets and there's also ancillary services. So PJM you're in one of the most robust marketplaces for energy markets in the country. You're with PJM with capacity markets, energy markets, ancillary services markets.

So one category is incentive based programs and the second FERC calls time based rates and those are things we are all familiar with; timer use rates, real time pricing, curtailable-or critical peak pricing. Our focus here is going to be on incentive based because that's the nature of the order that's coming from the Pennsylvania PUC. There are multiple benefits from demand response including more efficient use of the electric system in the short term. So to the extent that there's investment sitting out there in transmission distribution, generation capacity and we can shift some load of peak powers, we can make more use of that existing capacity. We're optimizing it, we're making more efficient use and not having to build to meet that critical peak and that's what the second bullet under this benefit category talks about. That is with the opportunity to defer additional generation transmission and distribution capacity. I used to work for a utility in the east that we had under an air conditioner load cycling program, 150,000 residential customers. Average reduction 1KW per customer, that's 150 megawatts, that's a power plant literally. The dispatcher could push that button and we saved building a power plant for 20 years, that's worth a lot of money.

Then improving system reliability as we all know there are critical periods, there are emergency periods and so to the extent that we have demand response resources

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ready and available then again we can on an hour's notice, 10 minutes notice, even 10 seconds notice under some demand response programs, we can respond to a system emergency. So it has that benefit.

And last but certainly not least I've listed here satisfy customers with additional energy services. It's certainly a true statement in the utility industry as well as the other industries-we want to give customers choices, we want to give them options as they are part of the electric system. So demand response gives them a program option in addition to what you're going to hear later about energy efficiency programs in other context.

Demand response has been cost effective, it's really been around for decades. Going back into the late 70's and early 80's demand response really took off in some parts of the country particularly with residential customers to the point where now 8% of U.S. customers participate in some kind of a demand response market. Eight percent sounds like a lot and it is, but that's largely residential customers. So you have programs like in Florida where they may have half a million people participating in an air conditioner cycling program or southern California where a quarter of a million people participate in a cycling program. So that adds to a large statistic but there's still a lot more potential.

In 2008 FERC estimates that 5.8% of the U.S. peak demand or the –if you add it all the peak loads of the U.S. together demand response could have served 5.8% of that capacity need, that resource need. EPRI recently completed earlier this year our forecast and they did a region by region analysis of demand response and for the region where Duquesne resides they estimate 5-8% is the potential for this region. So it's very significant. Now I'll push the up button or the down button to get to the next page? Down, so I pushed the down button.

And there is some local experience here in Duquesne's territory demand response, limited albeit but still some experience. There is a residential air conditioner cycling program that features a switch technology. I'll digress here and talk about well I'll come back to that later when I talk about program options. And there are 150 customers participating in that program which has been sitting there for about 5 years. Also because this utility is in the PJM marketplace there are curtailment service providers that are offering services and dispatching capacity and energy into the PJM marketplace. But there's still significant opportunities, there's air conditioning as a prime driver of course of peak loads and so that's going to be a main target of demand response programs in the residential and commercial facilities in particular. Lighting is also going to be a critical opportunity or significant opportunity for demand response, particularly of course in commercial industrial facilities, not in residential. Refrigeration in commercial industrial facilities is a major opportunity. One of my favorite examples-and when you get into demand response opportunities there's all sorts of imaginative

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solutions. It does not necessarily require big investments in hardware and communications and controls. One of my favorite examples is in Massachusetts a fish processing plant would of course have to have major refrigeration facilities. And every morning the fishing boats would come into unload their catch from the night or the day or the week before, and on days where the New England, ISO in New England power system needed capacity and was paying for economic dispatch, low and behold this fish processing facility would participate. They'd say well we're not going to run as much refrigeration today this afternoon. How'd they do that? They told the fisherman just leave the fish in the boat for another 5 or 6 hours before you unload it into our refrigeration plant and that saved them some load. It was already on ice to begin with. Low cost/no cost solutions can happen in demand response.

Another favorite example of mine is department stores and shopping centers, they can easily control some lights during some peak hours and make it a P.R. benefit so when a customer comes into that mall or comes into the department store and they notice that maybe the perimeter lights are off and maybe not all the escalators are working and not all the elevators are working they'll put a little sign out in the lobby and say we are participating in so and so utilities peak load management program or something like that-all kinds of win/win opportunities.

Of course a major opportunity is industrial processes to the extent that an oxygen furnace, an electric hard furnace or a production line or a processing facility can put off their load or not start up that day, major opportunities for peak load reduction. And of course backup generators which are found in any critical facility, a military facility, water, waste water treatment, large buildings, military bases provide an excellent opportunity to reduce load. And in fact in a lot of the curtailable load programs or the economic dispatch programs of some of the ISOs around the country, backup generators make up 20-30 or even 40% of the load reduction that's achieved under those kinds of demand response programs.

So our programs that we're going to look at here are those that are carefully targeted, proven performance and are cost effective and we're going to recommend for discussion purposes programs, a direct load control program which is dispatchable and a capacity and bidding programs that are voluntary and economic. A typical demand response regime could be as I've indicated on here that you may call on these resources 10-15 days a season, usually we're talking here summer in the afternoons for 2-5 hours to reduce their load, so an average of 48 hours per summer. Some utilities run these programs and they may only call on these demand response resources once or twice during the summer season, others will call on them 15 or 20 times. But for purposes of analysis we assume 48 hours per summer to do some benefit cost analysis.

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Normally we would have some breakout sessions and we may do that yet but before we do breakout sessions I wanted to at least outline the programs that we've put in here to stimulate some discussion and what I'm going to do is talk about the program or a brief description of what the program is, what the incentives that we assume for benefit cost analysis purposes, how it might go to market, the delivery options and some estimated funding goals and budgets and then we'll take your comments. Oh I should say, if there's any comments now let me stop, see if there's any discussion or questions before we move along. I see one right here.

John Shoma, Energy Connect. My question in this probably is something you're going to cover, or maybe not. The PA Act 129 has 2 parts we're talking just demand response here, there's also energy efficiency. So you; Duquesne Light's required to have one of each right? So one demand response program, one energy efficient program per class.

That's correct.

Okay so today what you're talking about, we're really hitting demand response only?

Right, and then this afternoon we're having the commercial and governmental subgroup, which will involve energy efficiency, maybe you can stay for that as well.

Okay that was my question.

Does that help?

Yes. I wanted to make sure that the 2 things tied together under the act and how they work because we're just looking to focus on this demand response although they are related. Thank you.

To combine the question with my answer here we'll just repeat it in the sense that the presentation this morning is specifically on demand response, which is required by the act. They'll be other presentations dealing with energy efficiency also required by the act.

I have a question as well.

Yes sir.

Gene Amadory, Inner Logics. The demand response programs that you're talking about; for example that last bullet point you said 10-15 weekday afternoons.

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What kind of dispatch time are you going to be providing to warn people that this is going to occur?

In the case of the residential programs that I'm familiar with at least, the customer has already volunteered in the case of a residential direct load control, which is probably where this really applies, residential direct load control air conditioner cycling program. The customer signed up ahead of time, typically, to participate, they get the control device which we'll talk about later and they don't really know when you're sending a signal out.

I'm talking more about the commercial and industrial.

In a sense there's no advance notice. In commercial/industrial we really didn't drill down that far, so it could be 10 minutes, it could be a half an hour.

Then in addition to that-

It could be a half a day you could have under some of these programs a day ahead market that you're bidding into or you could bid into a real-time market the next day.

In addition to that though, the PJM programs for capacity and energy are those going to apply as well? In other words could a customer actually double dip? So in other words could they get paid for the PJM capacity as well as the capacity from Duquesne?

We haven't addressed that either. That'd be a good discussion point here I think later on in our discussion. How would you balance it?

I think the answer to that is that the PJM program exists without Duquesne Light stepping into the fray. So there, it doesn't, it's a separate program.

No I understand that.

You can do, it can count toward Duquesne Light's goal.

It can or cannot?

It can. It exists without Duquesne Light.

So PJM is trying to get say for example energy efficiency where you're going to get paid in the capacity market for 4 years. So if you participated in that in PJM's goal, doesn't that meet Duquesne's goal as well? I mean if I were you guys, I'd count it.

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We'd love to count it, we'd love to –

It stands on its own.

No, no but still you're participating in-

The administration says that you can't claim anything that wouldn't exist unless you; Duquesne Light invested in it.

Okay so in other words if you helped assist that investment to provide a capacity reduction, Duquesne would count that?

Right.

But PJM would not? Is that what you're saying?

You know I think that it's something we want to talk with the commission about but they were fairly clear and as the gentleman said, that if there was a program that was already in progress that we couldn't actually utilize that.

Could not?

Right. However we do informal things or _____ made easier to _____ load, you know you do extra information work for PJM and other _____ like _____ and you know maybe come to some kind of decision between the two of us that we could utilize some new programs. (only on microphone at end of sentence. Various inaudible words)

Yeah you'd think that if you were enhancing it there would be some way to count at least part of that.

Right and I think too though I mean if customers signed up already with PJM they might have an annual contract or something so we could look again at next year when you go to sign up you know between the March and April timeframe you know for the June start of the DSR, that maybe we could do something if we were enhancing that. But we don't have any kind of determination on it. So far the commission kind of wanted to leave that on its own to PJM.

I'm going to try to summarize things here and I may get corrected. But so the discussion for people on the phone call was for demand response program particularly say for commercial industrial participants, how is that counted? Could they get double credit both for PJM purposes as well as Duquesne Light purposes and I guess what I'm hearing is no that's not the case that anything that we as Duquesne put together in the

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demand response arena has to be unique to Duquesne and it can sell into the PJM market but we can't sell twice. So that would be one of the things that we really did want to talk about here. I mean I could imagine a regime, I'll plant the seed- I could imagine an option where we have independent curtailment service providers or customers who are participating in the PJM market on their own and then we could have partnerships between Duquesne and other customers and has a partnership, they would participate in the PJM market but they would be separate. My colleague here Tom Crooks is going to chime in so this is a good discussion I think.

Thanks I just wanted to kind of create an opportunity, maybe a placeholder. You know as we're moving forward, we're talking about some fairly plain Jane demand response programs, direct dispatchable, direct load control programs. But as we move forward we want to you know open up or solicit your input on whether there is an interest in an economic dispatch program where Duquesne could serve to facilitate the market and actually increase participation in PJM programs and where Duquesne could facilitate the market by making advance metering available, or have access to customer bases through their customer organization which isn't ordinarily available to CSPs. So here's an opportunity where we want to say oh wait a minute we would have an interest in a role where Duquesne would provide that service and we could look at that as a DR, demand response, option as a program option going forward. So it's good to have it on record in this public workshop that there is an interest in that kind of program configuration.

Okay thank you Tom. So now I'm going to turn to-

I have one more question.

Oh excuse me.

The one thing I would about what you said and I'm sure you're right, you've researched it and you say _____. My worry would be you'll end up competing with PJM's programs. For example if PJM is offering 50,000 megawatt capacity and you're combination ends up being 25,000, you won't see any _____. I mean I'm just saying make sure you're aware of that because you'll end up competing with PJM and I don't think that's what the PECO wanted or the PEC wanted.

In this situation what we're talking about if this were to be – option, program option, in facilitating the market the economic benefit all comes from PJM, so nobody is double dipping or double counting. What we're doing is facilitating participation of PJM program that but for these activities would not be taking place.

Yeah but the point I'm making is Duquesne has got a score card so you've got to be cautious of that, that's all I'm you know, you run it the way you want to run it,

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I'm just saying be cautious of that because you know let's say you hit your number of 113 megawatts and it's all a PJM program, you're score card was 0.

So in that scenario, would Duquesne serve as the CSP within PJM? Is that what you're envisioning?

No this would be something that we'd have to work out. Duquesne is a CSP, they haven't been an active CSP. Maybe as we develop program definition we'd want to be you know opening up and RRP where competitive curtailment service providers would provide under subcontract a function of administrating the program and this would be a new program, not an existing PJM program. This would be a new initiative undertaken by Duquesne to facilitate that market. And I don't know these answers and it's not up to me, I'm their consultant and I don't make those decisions but we could you know throw these on the table and discuss this and see if there's an interest in this program configuration and advance it, move it forward.

But this forum could help identify those _____?

That's exactly what it's for.

And for the benefit of our listeners I'll try to summarize that too because it helps me keep myself straight. The most recent discussion I think is there's consensus that Duquesne's program is unique, has to compete in the PJM market against other resources that have bid into the PJM market, and to get counted to use the score card analogy-to get counted on the scorecard we have to be able to show; Duquesne has to be able to show that they've brought some additional, incremental resources to the market that cannot be counted against whatever resources may be provided into the market. I think that's a fair summary.

I'm going to turn now to just a brief description of 3 possible program ideas. The first one we've got listed here we call it here; residential air conditioner cycling. And target customers in terms of the general program description are going to be residential customers, single family homes with central air conditioning. Most programs stay away from apartments and condos because those units are smaller. Single family homes tend to have larger air conditioning units. And owner occupied is also a criteria that sometimes gets applied to these homes. It's easier to deal with an owner occupied situation than an owner/tenant situation particularly if the tenant is turning over every year or two and they're participating in a cycling program, they don't understand it or have agreed to it.

The load cycling equipment we assume for purpose of analysis is a switch similar to what Duquesne's already used in the 150 in their pilot program, with one significant difference and that is it has an adaptive algorithm. Some of these programs for instance

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will adopt a 50% cycling strategy, that is they'll cycle the air conditioner off 50 minutes out of every 60 minutes- excuse me 50% out of every 60 minutes, so 30 minutes on, 30 minutes off, that kind of thing. For some homes that are running full bore say a 95 degree day or a 98 degree day, you're going to get some pretty good load reduction, those air conditioners are running if they're properly designed . For other homes it might be over designed or have a higher set point on their thermostat. When you do 30 minutes on and 30 minutes off, or 15 minutes on, 15 minutes off, you're going to get into a natural cycle where you may not get any load reduction from those oversized units. So what an adaptive algorithm does is it looks back at the time that you're initiating a cycling event and tries to figure out, well out of that past 60 minutes, how many minutes were you running? And so each individual home may have a slightly different strategy targeted still at that 50% load reduction. But some homes may get cycled off more than others in order to try to get that load reduction down. So these switches have become much smarter if you will, with internal logic that allows them to look back over the last few minutes and the last few hours to see how the air conditioner is operating to get some load reduction, so that gets you additional load reduction.

Now the other major technology out here for air conditioner cycling switches is thermostat technology, where the utility will give the thermostat away typically to the customer and in exchange for that, it's a programmable thermostat the customer has complete use but in exchange for that, then the utility exercises control over the peak hours and the peak days that they want to do load curtailment and that's become a very popular technology. Customers like that programmable thermostat. The distinction in technology platforms is some of them have 1 way communication, some of them have 2 way communication. A one way communication the utility sends the signal out to that thermostat, it adjusts the set point for the air conditioning or adjusts the cycling strategy and the utility hopes that it's achieving some load reduction. There's 2 way designs to these thermostats so not only does the signal get sent but then there's a response back and the utility literally in real time can see how many of those units that they're interrogating have actually responded and are operating.

The thermostat program also typically has another advantage over the switch and that is that there's a prompt on the screen of that programmable thermostat that lets the customer know that the curtailment is going on or their light comes on and it will say curtailment and the customer can go and override it in most programs. So there's 2 generic types of technology; the switch technology and the thermostat technology. The switch technology has the advantage it's a little, it's cheaper, it's easier to install in that you can go to that customer once they've signed up, to their home and put the switch on, they don't need to be there because it's installed on the outdoor compressor of the air conditioning unit. Whereas a thermostat technology you've got to arrange an appointment with the customer and get into the house, put the thermostat in and so the installation costs as you can imagine are higher for a thermostat technology and the thermostat itself costs more than the switch. So for purposes of our analysis we

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assumed an expansion of the current switch technology that Duquesne has been using. And then the utility will call events depending upon their needs for system reliability and for buying power on the wholesale market or trying to sell into the wholesale market.

The incentives are variable but typically about \$30-\$35 a summer per air conditioner, per participant. So if you had a home with 2 units, they'd get 2 times that amount. We've assumed here \$8 a month for 4 summer months or \$32 dollars. Some programs offer a higher incentive if the customer agrees to 100% cycling so literally that means that the air conditioner is turned off and you can pay sometimes twice the amount of an incentive to get that reduction and you get more load reduction. Typically these programs are marketed through direct mailing programs, telemarketing, utility bill inserts, web sites, call centers and of course you want to reach out to public groups through civic clubs, churches, neighborhood associations go get participation. And some of these programs get some wonderful rates of participation. It's not uncommon to get 15, 20, 25% of the homes with central air conditioners to participate.

Delivery-typically that's a contract resource so we're not assuming that Duquesne has to hire people to install the equipment, maintain the equipment, you use contractors for that. Contractors will also provide a turnkey service, they'll do the marketing, they'll run the call center and some contractors will operate a full system where you contract with them for say 100 megawatts of capacity and they do everything to get that 100 megawatts. So there's all different, there's several different kind of business models to run a residential program.

I then looked also at what I call a small mid-size commercial industrial air conditioner cycling program and this is targeted to customers that are up to 300 KW. But the predominant size is going to be customers under 100 KW and again I'm assuming a switch technology here, a load cycling switch just for air conditioners. So think of eligible customers as being barber shops, doctor offices, small retail stores, small offices often these have residential type air conditioning units of 4 ton, 5 ton units. But this could also be applied to a fast food restaurant that's got 3 or so rooftop package units for air conditioning purposes, or even larger operations that might even have 5 or 10 packaged RTUs; rooftop units for air conditioning. And again I'm assuming for purposes of analysis that they've got a switch at no charge and that we paid them \$8 a month for 4 summer months assuming a 50% cycling strategy. So if you had a customer with 4 units, 4 times \$32 adds up to \$128.00 if my math is correct as the incentive that they would get for that participation. And we could offer a higher incentive if it's 100% cycling and it might be we'll do some market research and some more research to find if that \$8 a month might be too low for the Pittsburgh region. We might have to boost that up to a higher in terms to get the participation that we're interested in. Again direct marketing, bill inserts, public meetings would be how we would recruit customers and then again the delivery could be through contractors at different levels including just the installation or also at a higher level the marketing call center, the higher level the dispatch.

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The third program I looked at would be what I call a large CI or commercial industrial curtailable load program. The target customers there are going to be accounts over 300 KW and we would probably put a criteria for participation on there that we'd want at least 200 KW of load reduction to participate in the program to make it worth our while for them to participate. We would require the customer to have a communications system that would allow the utility or curtailment service provider to communicate with that customer when events are called or when we want to dispatch that load into the marketplace. End uses-the advantage here is going to be that we're not just focusing on air conditioning but the end uses could include lighting, ventilation, refrigeration processes, virtually anything that the customer can manage in those peak hours, in those hours when it's dispatched. The utility will call the events when they need it for reliability or economic dispatch. And the incentives if there's some equipment to cost for participation, metering costs for participation, part of the incentive could be that the utility would pick up that whole cost or that they would split it with the customer so that the customer is going to have some investment if you will, some skin in the game to participate in this direct, in this load response program, or curtailable load program. The incentive will be based upon the reduction so if a customer is able to reduce 2 megawatts they're going to get one level of incentive, if they can reduce 3 megawatts they're going to get a higher incentive and that is something that can be contracted in advance with the customer and it can also vary from event to event. So one regime is that the customer gets paid, they may reduce 2 megawatts on one day and you call them a week later and they may only be able to reduce 1.5 megawatts and you can structure the program to allow that flexibility or you can structure the program that has a minimum performance level. We always want 2 megawatts and you can have some penalties associated with failure to meet that 2 megawatts if you want so there's all different ways again-business models to work with customers on what the incentive is. Then the incentive would be tied in some fashion to what the wholesale market price is. So for purposes of our benefit cost analysis we've actually did, we used the PJM capacity market cost to develop our benefit cost analysis, we used PJM's energy cost to come up with our cost benefit analysis. So we assumed that this program would be cost effective bidding into that—we assume that we've found that this program would be cost effective bidding into that PJM capacity market and energy market.

The marketing here obviously is going to be a little different. It's going to be more one on one, person to person with key account executives if the utility is involved or if there's a curtailment service provider. The utility could supplement that with bill inserts, call centers, and web sites to help build awareness, provide information. But that's going to be more of a commercial marketing, industrial marketing strategy. Here again the delivery could be handled purely where a contractor does any installation if there's monitoring and communications equipment that's required for this program and the utility wants to maintain total control they can hire a contractor to put in that information communication system or they can step back and say no we're going, we don't want to

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be that hands on, we will hire a third party, we'll work with a contract maybe with a curtailment service provider or a handful or curtailment service providers. We might help make the introduction to the customer, we might help close the deal, we get a consideration that the curtailment service provider gets a consideration, the customer gets a consideration. All of that would have to be worked out as how this benefit gets divided between the utility, the customer and a curtailment service provider. So there's again all kinds of business models that we could conceive of in terms of that load program.

This is just a summary of the 3 programs and the forecast that we made in terms of numbers of participants for residential load control, we assumed that by the third year of the program; third year of full implementation we would have 4,100 participants and that's assuming 1% of the eligible customers; that is those with central air conditioning, 1% per year per participant. So after those many years we'd have 3% of the homes, single family homes with central air conditioners assumed would be in the program, that'd be 4,100 and that would provide a megawatt reduction of - I wrote it down somewhere else but I didn't write it on here-of about 5 megawatts. So those 41 homes we would hope to get 5 megawatts of load reduction.

Under the small-mid commercial industrial load program again we're using a switch on air conditioners and those small customers we're assuming again a 1% penetration per year in terms of 1% of the customers. There's 54,000 customers Duquesne has roughly in this category of under 300 KW so if we can get 1% of those a year signed up we would have 2,160 customers by May of 2013, that would give us 8 megawatts of load reduction.

Then for the large commercial industrial program we're assuming that we could get- there are about 900 customers that fall in the category of over 300 KW and if we could get 2% of those a year which I think is pretty modest, that would be 18 the first year, 36 the second, 54 and we could get an estimated 13 megawatts out of those participants. Just showing here through 2013, we've actually done analysis through 2020 assuming we would keep ramping up the programs, we'd keep recruiting but we've cut it off for purposes of analysis at this level.

The utility costs estimated here under the residential load control program, all of them together would be about \$1 million dollars a year by the third year, residential load control would be \$456,000 out of that, small commercial load control program costs would be \$414,000 large CNI, commercial industrial would be about \$188,000 and this is assuming, these costs are assuming any costs the utility has to bear for the equipment. So for example on the switch the cost to put in the switch, the cost of the switch for residential cycling, it includes marketing costs, it includes program management costs, it includes measurement and verification costs and it includes some failure rate and replacement rate. So we've tried to anticipate the costs and all these

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costs, take all these cost factors into account and particularly for the large CNI curtailable load that's where, depending on what business model we approve as to whether the utility really bears these costs or whether a third party provider may bear the costs and then it gets recovered through whatever the contract arrangement is.

So with that I will stop and I guess take questions and comments and my colleague I think Tom Crooks is going to help me with this, but I see we have a question here right now and I'll repeat the question for the purpose of the audience.

When you talked about the programs and the utility and everything, Duquesne is not allowed to solely run these programs, right, I mean they have to be done by somebody else right? Like you couldn't say well we're going to do all these things ourselves through our own methods with our own people? Am I right?

The requirement is that Duquesne has to hire certain CSPs. There's no specific delineation as to how those CSPs have to be utilized but you know from a practical standpoint Duquesne is not in the business right now of running all of these programs?

Well I asked that because some of the utilities have some of these programs in place that people participate in now which is the second question. Anybody that's in now, doesn't count moving forward right?

Correct.

So if you looked at and said we have X amount of customers, if they're participating today, I'm talking larger industrials, they already are in there? You can't go back to them and say okay now we want you to go forward with us again?

Right but the large that are in there are in there through PJM, the only programs curtailment programs Duquesne currently has is the residential air conditioner and it's very small, very minimal.

I'm talking more about the larger guys because I know people that are in the program so, you know, when you start looking moving forward then they really don't help you with what you're up against.

Right and there's a couple things to keep in mind when you think about people who are already in the programs. If they're already in the program, we can't go back and count them, okay. Now what we can do is develop programs or modify programs and put an investment in and take the credit.

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Which is the energy efficiency side as well because they do tie together right because you put in some more energy efficient equipment and you're actually producing an additional curtailable load right? So they are because when you add up the numbers you're saying 5, 8 and 13 that's not quite 113 so there's more. I'm trying to get a handle on where the rest of its coming from I'm assuming that's where it comes from.

Demand response is a challenge the way the numbers lay out right now.

But you are absolutely right, when we do energy efficiency measures there will be some depending on the measures some conservation demand response effects from it.

But I mean we're talking about a 5 and 8 and 13 megawatts -- that's 26 megawatts and you're saying you're on the hook essentially for 113?

Both energy and demand benefits associated with energy efficiency. With the forecast programs, the programs that we'll be ruling out in the workshops addressing energy efficiency, we'll demonstrate that using the forecast energy efficiency programs we can achieve the 113 megawatts of demand reduction without the demand response programs. Because there is some uncertainty as to those 100 hours and how we're going to count those 100 hours and we can't be uncertain as to achieving the mandated reductions. So there will be demand reductions associated with energy efficiency which will meet those mandates.

To his point, though, we still are required to submit demand response programs for each class.

So, to you, do you envision it as being 1 person to make it simple, 1 person doing both that says well we're a guy that does a lot of energy efficiency stuff and we're going to go and offer these programs and part of thing is we're also going to do the demand response with it. I mean is that a benefit to Duquesne? I mean I would think it probably is but...

Yeah I think most programs and if you look across the country are all leading in this direction and that is toward an integrated energy efficiency demand response, renewable energy, one stop shop approach to customer service and so to the extent that a contractor becomes the implementer of energy efficiency programs and is able to do both, that's good for the customer. On the other hand we need to differentiate the demand response program and so it needs to have its own programmatic offering. So if you will it will be more of an arrow in the quiver approach than which you could provide or direct the customer to you know how to participate in those programs rather than being the same program.

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One of the new acronyms these days relative is called IDSM, everybody knows DSM stands for Demand Side Management. IDSM is Integrated Demand Side Management. In some parts of the country that's gotten to be a mantra because utilities offered demand response programs, they offered energy efficiency programs and within the organization they were separate silos and they really didn't work with each other and the commissions have now encouraged utilities, let's get these things integrated. So I think one of the duties and opportunities Duquesne has here is that they'll be able to design these programs on an integrated basis so that they can be more comprehensive, more cost beneficial and how it plays out internally in terms of organization, accounting, those kinds of things can be worked out, but from a customer perspective it's definitely a good thing.

Ruth DeLost of DL question for attendees who represent CSPs in PJM: Once you get the foot in the door, I mean that's the tough thing is to get a new customer in a sense, would you like to go forward with energy efficiency too? Are you offering any of that now as you go in as a CSP with PJM, are you offering energy efficiencies along with the DR.

No. I think what you have to be careful of is doing what you do well. So there are a lot of companies that are performance contractors that are performing energy efficiency and provide the payback and in some cases provide financing. Then there's the market piece which is the either capacity or the energy that you know typical I don't know why Pennsylvania ever came with it but CSP in the sense of curtailment service provider as opposed to a conservation service provider, that you don't want to end up competing with people who are going to bring business to you and I think that's what the concern is. So if a performance contractor is out there and they're offering energy efficiency and we're offering payment for capacity or facilitating putting you into them market, now I'm going to end up competing with them because they're saying you're offering the same products that I am. So you have to be careful and I think it's the same thing with Duquesne. There's no reason that Duquesne couldn't be an aggregator of these accounts, it's just something that's not your focus right now. But my concern is if I look at these dollars and you're going to spend \$20 million a year roughly and now you're spending a million dollars in 2013 on DR, my assumption from just the weighted dollars that means \$19 million is going to energy efficiency, \$1 million is going to DR. So my interpretation of that would mean that you're focused more on energy efficiency. Is that a fair statement?

I guess the thing is, as mentioned before, we're kind of in competition with PJM and so we know it's not easy for us to see what we can get our arms around with DSR right now.

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Yeah but energy efficiency you're going to compete with them as well because with the 4 year capacity payment you're going to do the same thing. That's why I'm saying you've got to be very cautious because if you don't get your dollars up to at least close, why would somebody participate in the Duquesne program and then you'll be end up sitting here holding the bag saying: "Hey I got this \$20 million I'm collecting it from my rate payers and oh by the way I've delivered 4 megawatts." Somebody is going to rap somebody's knuckles. That's all I'm getting at is I think there's got to be a way and I think you hit on this, was if I have an existing account that's an industrial for example that's doing whatever and now I go in and assist them with a better metering solution, more access to the market, more whatever, and now that 10 megawatt of response from this big steel plant becomes 20, you certainly should be able to count 10. But that's not my rules, I'm not making that, but I'm saying if I were you, I would say here this is the reason they went from 10-20 because we went in and did XY and Z and therefore we should count that 10. I guess I would say from a standpoint of the way you're developing your program I would certainly push for that. Then the same thing with energy efficiency, you're going to see a number of these performance contractors that are in the Duquesne market that are executing energy efficiency if you tie in with them then they'll start offering an additional incentive that takes a payback from 4 years to 3.5 which all of the sudden brings maybe additional solutions or performance, conservation alternatives that enhance what they were doing that's certainly something that you should be counting. 113 megawatts is not a slam dunk so you've got to start looking at some of these things to be able to do that.

In the energy efficiency side it's easier for me I guess that's maybe because my focus is energy efficiency but we all taut what it is we know about. But you know we have very clear causality associated with what we're doing. We have EM&V protocols in place which ensure that we are counting what we actually influence and have happen. We'll have specialized programs which are tailored to meet the barriers associated with specific market segments entering the, participating in energy efficiency programs. These don't exist, they're not out there being offered right now. So while there is some if you were to look at it from some perspective, competition with an existing energy efficiency market we'll be able to show clearly causality and incremental growth associated in energy efficiency. This is the design of the programs. The demand response area again, I'll defer to Larry, that's the reason he's here on our team. But our difficulty with the demand response has been you know kind of retroactive one what you did in the top 100 hours versus being able to go out and target and achieving reductions that you can point to and prove. So when it comes to allocating money to achieve mandates, you're going to put the money where you know or you feel safe that you're going to be able to justify and prove that you did what it is you were supposed to do. There's more difficulty doing that and I think it's a, I think it's a regulatory legislative legacy which is not a good one. Because I think really the very useful demand

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response capacities need to be valued and emphasized. They're not under the current operating rules. They need to be. They're not. And in as much they're not we have to achieve a mandate in reductions.

Well, I think you're right. I think the real key on all of these is the M&V. But it's, you know, you're very comfortable with conservation or energy efficiency where we're more comfortable with the demand response where you know it's a baseline is a baseline. So to me if I take the PLC the ____ peaks or whatever and now I deliver a 10% reduction on that based on meter data from your shop, that's no different to me than taking a low profile and then applying into it an energy efficiency that showed you had a 7% reduction in those hours. I mean I'm questioning why it's any different.

It probably isn't and I'll defer to your expertise and that of Larry. One of the questions I have and I was interested in the earlier discussion we had, you know, having this opportunity to have you here and get your influence on our program designs – what we've talked about are kind of plain jane off the shelf kind of direct load control program switches and thermostats and curtailment, you know. Is there an interest on the part of you as potential implementers in a program wherein you'd be working on economic drivers, economic load control or facilitating or participating in a program that Duquesne would facilitate whereby you could implement programs using their metering and data and customer access. Is there an interest in that?

Absolutely. I think that the real key here is providing, you know and I'm sure you guys want to put – I mean every account you have you want to have some sort of automatic meter reading but you're restrained by the amount of money you have to be able to do that. And so every time you add in another layer that allows you to get a little farther down the path I mean certainly makes a lot of sense. But I mean I just kind of did a real rough math and said okay if the next two years you get 20 million a year, that's 40 million dollars divided by 113 megawatts, I mean it's 350 bucks a kilowatt. I mean that's a pretty good deal, it's a heck of a lot less expensive than a coal fired plant. You know so I think the program that I would say and I'm sure the public utility commission looked at it, if you can affect what you want to do for 40 million or 60 whatever the number is, it's pretty good, it's a pretty wise of spending the rate payers money. And I think that's what you guys are looking at. But I think all I'm saying is – we would be more than happy to help you but you've got to be real cautious here because there's some pretty good programs out there with PJM, there's a 4 year going forward now energy efficiency payment for capacity. Those numbers are setting the bar pretty high, so you are going to have to be cautious that as you develop your incentive program that you at least are comparable because the market is getting better and better educated all the time.

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Yeah, I've seen EE programs lately that have like a \$100 per KW kicker along with the EE incentive that goes along with it, so that it motivates. I've also seen control mechanisms where if performance contractors, or contractors implementing energy efficiency programs don't meet a certain ratio of demand vs. energy, then they don't meet their performance threshold and don't get paid. So there is – there are different ways of turning down the screws that I've seen used and capacity is a big part of that. It's got to be.

DL Question: Gene, are there things in the PJM program that you would like to have changes or things that we could do to enhance it if we would partner with CSPs to get extra curtailment?

Oh absolutely. You know the biggest key is the metering. So the farther along that you are from the standpoint of whether it's a web based, you know, for example a number of the utilities that have web based solutions now, I don't get that meter data until tomorrow.

And so the idea of getting metering data quicker into our software solutions and what not, a huge enhancement. It's a huge enhancement for the customer to say okay, if I effect my load reduction right now, if I'm not going to see the meter until tomorrow I don't even really know exactly what I did. So most of these large industrials have their own metering system layered on top of yours, which seems kind of silly, doesn't it?

Yeah, we'd pass it down to a PDR, Pulse Data Recorder, so you would have the KYZ pulses and know immediately what's going on. And so if Duquesne Light set up their CNI customers we could pass information down you know to PDRs, post things on the web then, day after that was reconciled data. Now here's where Ed Johnstonbaugh is going to jump in and keep us straight here with what the – what the commission said. Would you as CSPs say, look, here is what I was able to gather this year for our DSR program because these are the things that Duquesne Light has offered to help we can, you know, get another 50 megawatts or something?

Absolutely. And I think probably the biggest key are some of the things that you were just mentioning, but the other biggest key is that the CSPs and Duquesne Light be on the same side of the table. So in other words, if as an aggregator we are in talking to a customer and you know good news for you, most of them say gee, I'd like to talk to my Duquesne rep and see what he says. So what you need is a positive statement from the Duquesne rep who says hey, these are good programs, they help hold wholesale market prices down, they are good for the whole economy, blah, blah, blah. That's what you really need. So in other words it's not a huge, huge effort on the Duquesne part, it's just that you are saying the positive things. We are supporting these, and as a matter of fact we offer you

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know these other programs or whatever. And so the kinds of things that I think you know Duquesne needs to do is part of it's a mindset to say hey, you know, we are very supportive of this, we don't want anybody to get ripped off, we want to be supporting you. And in addition to that these are the kinds of things we are offering. We are going to have a meter solution that's available in 2010, and this is how it's going to work. Now it might cost you something, here's the benefit that you are going to get.

Oh yeah, right. And so let me ask one other thing. If Duquesne then would step in and not only you know have the metering solution, be able to pass real time KYZ pulses down, what if when you signed up your customers in PJM if Duquesne offered something once we get all of the folks that are in the Duquesne zone, so all of your accounts you sign up, and we aggregate everything for you, we say here is the forecast day ahead for your customers, you know and then put that out someplace where you aggregate all of the customers that you, Energy Connect, has signed up, or you, Energy Logic or whoever, I mean would those types of things be helpful to a program?

Absolutely.

Yes, because remember the market is getting very sophisticated, you know. Not necessarily here, but in other parts of PJM there are many, many block and index customers, there are many day ahead, you know, people are buying in the forward market and all of that. Now, the large accounts, you know like U.S. Steel is going to do that, but you are finding that many, many universities are able to do that now as well. And so I'm not saying University of Pittsburgh does, but they certainly could. And so those are the kind of things that ultimately, especially because you know Duquesne not only in generation, you know you are really a pass through, right?

Right.

And to a degree what you want is your customers to be – have lower costs and all of those things so that they are more successful and they build more and add more jobs and whatnot. So the more you do to get their costs lower, if it doesn't cost you any money the better off you know Duquesne is as well. So I mean these are all positives, there should be no negative out of this.

Okay, yeah, and I think it's the things that we need to explore with you what type of information you need, when do you need it, how could Duquesne partner so that we could take advantage of these.

Sure, we can talk offline.

Demand Response Subgroup Meeting (continued)

DL Question (for the CSPs). What do you find the biggest hurdle you have when you go in to talk about a customer about any demand response program? Is it their understanding how it's going to impact their process? Is it just – just tell me how it's going to impact my bottom line? I mean what's the biggest hurdle that you have to get over?

A couple of things, but one of the things that most people immediately say is I can't do that. Okay, I can't shed load for that amount of time, I just can't do it. And so then you starting asking them, well, okay, you know what is your business? You know of course make steel, make bottles, make whatever and ultimately if you talk to the CFO what's his business, it's to make profit. So now what you've got to do is get it into an equation where you know how many dollars do I get from demand response, how many dollars do I get from energy efficiency? And once you start breaking it down and looking at it from a – it's a financial sale is what it is. Once you get down to that point and if I shut that steel plant down I don't make steel today, but I got paid you know \$40,000 of megawatt in the PJM current rules for this year, is that more money than the lost production? It's probably not more money than the lost production, but if I'm only making 3% on a ton of steel profit, it's way more than the lost profit. So it depends on whom you are talking to and how you are presenting this.

From a standpoint of once you get past those kinds of concepts, most of these sales, not – nothing is easy, but at least it's to the point where you have a 50/50 shot at it. And then of course what do I have to do to implement it, you know, the metering, you know I have a built-in automation system, how do I do that? How do I operate it, on and on and on. But you know, there are many, many ways to do it, it's just a matter of in a lot of cases it's a collaborative sale because you've got to have you know a number of departments within these organizations buy into it.

Now do they want – do they want to be able to at the end of the day say no, I can't do it now. Do they want that ultimate decision power to say yes or no if they sign onto a program?

Well, it depends on the way the contract is written.

No, I know it depends on how the contract is written to implement it, but I mean as far as their desires, do they – a lot of them want that ultimate veto power?

I think given the infancy for some of these customers, this is often when you are going in to talk to them, it's the first time that they've been down this path, and they want that. Right? But after the first summer that they've been through it they realize that it was not near as disruptive as they might have thought it would have

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been, and actually embrace it and become more flexible. Where we are now in the marketing and the promotion of demand response what you find is in the initial sale, which a lot of what we are going through with our clients throughout all of PJM is they feel like they have to get sign-off, nobody wants to step out and take this great risk that they are signing a contract which is going to force them to do something at some point in time where they are not going to have control over their building. But after the first season they've been through it, it becomes why didn't we do this earlier? So a lot of it is just where we are in the education process.

DL Comment: After you are in the first year you that are all CSPs that have been in PJM, once you are in the first year, isn't the second year so much easier when they see their PLC drop. I mean if you've actually curtailed during the peak hours I mean it's got to be – their capacity just you know drops down to so very little, to a third of what it was. I mean you'd think then you could say you know not only are you curtailing, but look what you've done when you curtailed in these 5 peak hours, your capacity costs have dropped out of sight too. I mean it's just...

Well, that all, that all benefits from it. But this is – this is very similar to when deregulation first started, right? In the early years nobody wanted to trust that this was a program people wanted to embrace. And those first movers really felt like they were stepping out into a whole dark void of what does this really mean? But we are seeing it, for example we have a lot of, a lot of my clients are in Chicago, in the PJM market in Chicago. Com Ed has done a great job helping to promote that program. They have their own program similar to what you are talking about here. So a lot of the customers out there, and by the way I don't know if you've looked at the Com Ed-PJM relationship but that might be one for you to investigate because they are allowed to “double dip” in that marketplace, they can participate in both the utility program and in the PJM program. So from that perspective there is – their customers there are much more comfortable with the notion of when they are approached on the PJM side that they've been doing this with Com Ed for quite some time.

Just one other thing, when you are asking how you can help or what you can do, having information to put in front of the customer also helps when they say aw, we can't do this. There is no way we can do this. But if you have a year's worth of historical data that's legit from Duquesne, from their meter, whatever, then you can put that out there and show them day after day after day the opportunities that exist and put that into some kind of format that they can understand. We don't get that because we have to ask for it and we have to beg for it, we have to pay for it. And so we don't do it, because we might do that with 10 people and none of them do it so it becomes – all right, you either get it or you don't. Does that make sense?

Demand Response Subgroup Meeting (continued)

Yeah, I think the thing, John, is you know, on the larger customers -- 300 KW and above -- of course we have interval data, and until we you know get into the smart metering or spend more on our metering we don't have that interval data for the people even to share with the CSPs, it's not like we're saying oh no, I can't give you anything, I don't have it to give you. I have the daily information that we can apply a profile to, and certainly you know send that out but there's nothing that we have hourly unless we turn the meters on for that.

I didn't realize, that you have 900 customers that _____.

Well, let me say this, yeah, the larger customers, close to 900, you know, 300 KW and above were required to pull back interval reads.

But that's very manageable is what I'm getting at from your standpoint.

For those 900 yeah.

That should have been available since deregulation though, the hourly load data where it is recorded, and where it's not recorded you just work off the class load profile.

Right, that's what I'm saying you know, if it's not we pull back daily reads and I guess you know we'd have to apply a profile.

900 customers that you are collecting this from that – that you want to maybe display to them hourly if they wanted to look at the data from last hour right now, that's not a huge IT effort. I mean I know it is.

Let me say this. I talked to the IT lady.

I mean it's not 10,000 customers.

Yeah, it's not 10,000, but once again, I mean if we call the meter you know nightly and bring back interval reads, because you are paying for that, you know that cell call or landline, depending on what's out there at that customer.

The bandwidth.

So calling them every single hour, you know, trying to back call that and you know go through the data and edit everything and put it out in the web is you know aggressive. So even for 900 customers. I mean I'm thinking that for those types of customers if you have the meter out there that has the KYZ and time pulse in and we pass that down to a

Demand Response Subgroup Meeting (continued)

PDR or something you'd have you know the minute by minute information and then at night when we back call things the next day we could present you know all of the load data, hourly load data that would have already been edited. So I'm thinking for those who need things immediately that would be the way to go.

I'm going to ask if there is anybody on the phone that has any questions.

This is Pam, and I don't have any questions, but not having the presentation I am interested really in kind of your cost benefit analysis on the large C&I and once I see that I might try and get in touch with you all to work through that.

That's fine, Pam.

Well, we are in a VA hospital, so actually I talked with the PJM before programmer, and then they are talking about response demands, but because we are a hospital so I don't want to have you know some meter of the surgery or something so they will cut off you know the loading demands. But I want to ask is this program – how many times would we be asked, maximum, to be reduced?

This is Larry Darrett. That will be variable I guess. Hospitals often view themselves as unique but just like this gentleman said back here sometimes once they're in programs like this, they learn how to do things they hadn't thought of. Most hospitals for instance have backup generators.

Yes, we do but that generation –

A lot of times those participate in those demand response programs for instance. So how often would they be called? It's going to depend perhaps on a variety of factors. For instance, it could depend upon how high the wholesale market price is. Some years it may be maximum who knows 200 dollars a megawatt hour, 300 dollars a megawatt hour, you may have no events but it might be it might be 2000 dollars.

No, I mean how many times? How many times, maximum, would we have to reduce? In PJM, they say the maximum is about ten times. For eight times, it would be just 4 hours maximum.

Right and I showed that on a slide earlier. It could be ten or fifteen times per summer.

Because we have generation, you know, backup, but we don't want to get the generator – it's maximum you know using it because that's an emergency generator.

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All those refinements have to be worked out with environmental rules and other kinds of rules but typically on a load control program or curtail able load program, it's not necessarily economic to dispatch 10 or 15 times in a summer.

And that's typical. You know, keep in mind we're just talking about broad programs, the specific parameters of Duquesne's programs have not been designed yet. So we don't know if it's 10, 15...there could be a design parameter around you signing up for something that is a certain dollar amount for ten curtailments, another dollar amount if you're willing to go 15 curtailments, so those are the things that we've yet to design into the program. So we'd be interesting in knowing from you what you could actually be comfortable with.

What if you know if you call and then we can't, that time we can't. Then what happens?

Depending on the design, there could be a penalty associated with that if you signed up for the higher level and you can't curtail or if you signed up for the lower level, maybe there is no penalty, maybe you have the option – I've seen programs designed where you have the option to be called but you can deny that call twice a year, something like that.

Okay, so that program would be later, you will present later right?

Yes. But what I would encourage you to do is to give us a conceptual idea of your comfort level and we can't guarantee that that will be in the design but if you like the possibility that maybe there's 2 times you can be called within a 12 month period that you can say no if you like, you know, that you'd rather get a penalty if you said no, you know, the tolerance level I guess is what we are trying to monitor.

Anyone else on the phone have any questions? No. I think – was Pam the only one on the phone? Okay, all right. Let's have some more questions here in the room, we have about 20 more minutes so we'd like to make the best use of our time.

Did you all that came to today's workshop know what this was about? This was demand response and it was –

We are getting a lot of yeses.

Good, that's encouraging. Thanks.

DL Question: They were talking about Duquesne working with curtailment service providers, CSPs, do you have any thoughts on whether – how that would work? Would it work with one only, or multiple CSPs in different market segments? How do we try to

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develop that relationship with CSPs? Do we do a competitive bid process of some sort? And say maybe –

Do you mean curtailment service providers? Or conservation service providers?

Oh, I meant curtailment service providers, yeah.

Well, curtailment service providers, a PJM entity, if you want to play ball with them you do, if you don't you don't.

You take the test and you play ball, right?

Right, that's a PJM phenomenon. I would offer a question here, you indicated that the commission has come out in favor of incentive-based demand response. You've indicated that the commission has adopted or thrown their weight behind the incentive based demand response program, any feel for where you saw that? And the reason I throw that out is because they've also said that for each customer class you will have an hourly price rate.

I think, Ed, at this point in time what we were doing is we were looking at the potential that is out there in designing programs to begin facilitation of the discussion. To the extent that there's a lot of interest in incentive based programs, that might be a way to make a filing to kind of get – get the PUC interested. I don't think there is anything in the regs that precludes that.

Okay. The reason you know I bring that up is because you've talked about in the residential world just the basic switch, on/off or a programmable thermostat. And to the notion that was brought up here about the VA Hospital as an example, an alternative to air-conditioner cycling is precooling. If you are working in an hourly price world, then you cool your domain at the appropriate pricing and you let it ride through the peak price hours. So I mean that's – you mentioned integrated, integrated demand response, that's in my view what integrated demand response looks like. It's taking into consideration the changes in the market pre and post peak hour and teaching your equipment to respond to that, which would go to the necessity or the fear of multiple interruptions over the course of a summer. If your equipment is dynamically operated and buys the energy at the lower price hours, then you don't have that fear of lack of capacity during this interruption period.

It's sort of like the fish ice example, isn't it.

And there are some programs in the country that are doing just that. And some of the curtailment service providers in this room are probably doing some of that with their

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existing customers, so they are precooling in the morning to coast through the afternoon. One of the features of some of these programmable thermostats is to have a price signal feature, so that if the customer sees a price of say 10 cents a kilowatt hour the thermostat is programmed to stay at 72 degrees in cooling, and if the price is 15 cents a kilowatt hour then it goes up to 76 degrees. And if the price is 20 cents a kilowatt hour it goes up to 80 degrees, and if it's 25 cents turn off the air-conditioner. That –

I agree with you, Larry. As a matter of fact, and Cindy may recall this, Allegheny ran the only real time pricing program in the state back in the early parts of this decade that ran that type of equipment. So that's what I'm – I guess my point is, is been there, done that and I'm just trying to see if you've got anything on the horizon that's taken us to the next level in terms of opportunity, or is that the ball is in the court of the conservation service providers to put legs under those types of programs for you.

I was just going to say that I think the way this has rolled out for Act 129 is first you have the energy efficiency and DSR filing and then there's the filing for the smart metering which has the real time pricing and time of use for every single rate plan. And that filing you know hasn't happened yet, I mean we're just in the comment period. And so a lot of those programs that you're talking about of course require us to have the smart meters in so you have the integral data so you can do your cooling, so you can pass down that price information and so on and so forth. So is it on the horizon? Yes. But I think it might be a little bit later...

But I mean to that point I think what Ruth is getting at is, you know, with that, those technology advancements, there's additional opportunities to have more sophisticated demand response programs which is I think what I'm hearing from you. Something more along the lines of what – home area networks or what were you thinking?

Well it was kind of what – I'm just reiterating in a roundabout way what I mentioned to you before the start of the program today and that is in order to get to your program numbers, you cannot take anything off the table. And you know these types of opportunities, rolling out for example an hour pricing backup with technology which you pointed out needs to be part of the program, is going to put more opportunities on the table to meet those kinds of goals then you will if you limit it to compressor switches and the more – I don't know what the – I don't know when the start of that technology dates back to but I was in the utility business for about 25 years now and it's always been, depending on where you're at in the country, something that's been available.

So what I hear you saying is that we should leverage and look for opportunities to integrate the new smart metering initiatives with demand response and energy

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efficiency as is intended, as an integrated whole package to be able to do this. To really get the bang for the buck we're going to have to get to make these goals, we're going to bring in all of the tools.

Well and just to fill out an example of a potential opportunity, solar photovoltaic just happens to have a peaking characteristic in a daily profile that kind of lines up with what will be your or Duquesne's peaking load at any given peak summer day. And that technology just happens to be included in what the commission considers to be an appropriate approved measure and how does that integrate with this and you know that lends itself or the need to have smart meter associated with it. So that you can value the actual contribution.

Right. I think the challenge we can meet is defining the avoided cost in terms of a total resource cost test. Is this a cheaper thing than a supply side alternative. If it is and we can prove it.

It is a supply side alternative.

It is but under the regulation as you clarified or you pointed out, under this regulatory construct although it is a supply side alternative, photovoltaic that is, it is being treated as a demand side resource and can be applied in these programs both demand response and energy efficiency. The question is, is under those circumstances, is it cost effective when compared to the supply side alternative.

Well, and that's the price that you have to identify. Is it worth 5 cents or is it worth 10 cents a kilowatt-hour to put into your bucket of avoided or saved energy. But once again when I roll into other components that support that type of technology out in the marketplace like an alternative energy credit – having 5 to 10 cent contribution on Duquesne Light side of the equation just goes into support the other pieces of the mechanisms that make those systems happen. Do you follow me there?

I hear you, I hear you. It's interesting I mean if we have 10 cents a KWH annualized that we can contribute towards, towards making something happen. But really the cost is 50 cents. But you can get 25 cents from this fund over here and 5 more cents from this fund over here, you only have 10 to make the difference. Can we then use energy efficiency or demand response money to close the gap. That's what we have to look very closely at.

Well and that's another thing that goes back to the directive from the commission, the commission says that each utility will maintain an active list or current list of alternative funding sources. So you need to have a go-to list for where hospitals, schools, municipalities, private industry, businesses, can go to

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see what they can find that helps them support the ten cents that Duquesne light -- I like that number -- is willing to contribute toward an example of a solar photovoltaic system or some other alternative generation facility. So you know that -- we're not looking at and you know, in a lot of cases these measures aren't going to be only Duquesne Light stand alone measures. There will be matching funds either from project owners, business owners, whatever that go in to making these measures, the implementation of these measures occur.

I think that what you need to be careful of and that is the definition of solar resource cost tests. And if we look at the California Standard Practice manual which has been adopted by the commission and TRCs definition within that manual, we're talking about the cost of the technology plus admin of the programs, incentives don't weigh into it. So because you're taking from society and giving to society, they consider it to be a transfer cost, they don't count it. So under the TRC cost test you take your total cost of the equipment plus the administration of the program and you weigh whether that in its net present value is cheaper than the supply side alternative. And that's where you're going to run into problems with a photovoltaic in an EE or DR program under a TRC cost test.

It's an accounting practice, I can relate to that. There are ways to work those things out too.

If there is some definite concession on the part of the regulator that says yes, this is how you will treat this differently but so far we have the TRC and the TRC is defined as it is.

(inaudible comment)

Right now under the regulatory compact, as I understand it, we cannot use environmental externalities benefits to the cost effectiveness calculation. So carbon --

(inaudible comment)

It may be beneficial because you are collecting all the data as it is right now.

Can you expand on that a little bit? I'm not sure I'm following what...

You know it's a pretty basic calculation. You can say if I reduce so many kilowatt hours and you know, I'll use, again, it's a little hokey in the sense of where did that kilowatt come from, was it coal-fired, was it nuclear, whatever. But anyways, most utilities and I'm sure Duquesne has a number that says for every kilowatt-hour I produce so many pounds of carbon. Now if I, in our system now and we take the energy efficiency that you're going to talk about this afternoon, if I reduce how many millions of kilowatt-hours to what it was, there's going to be a

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related carbon reduction. Okay, right now that's trading for four dollars a ton in the U.S. and 13 bucks a ton in Europe but based on some of the legislation that's coming out the value in the U.S. may be greater than what it is in Europe. We don't know, no one knows. So is that something that you are at least going to be mentioning to your customers to say, in addition to help provide these funds that help you get over the hump on some of these investments, we will and some utilities are saying we get all those renewable energy credits. In some cases they're saying you can keep those, in some cases they're negotiable. So far, for example in Arizona, a gentleman over here is on the solar side but in Arizona if you provide a solar system that's grid connected, Tucson Electric and Arizona Public Service, they get the renewable energy credit.

Depends on the laws in place. Because you're mixing renewable energy credit and carbon credit.

No, no, I was just giving it as an example. I was giving an example. But what I'm saying is – you Duquesne can say to somebody I'm going to take, you know, because okay, you're not.

There is – in the alternative energy credit world in Pennsylvania -- there's a tier two credit that all energy efficiencies would fall into and the commission generally has ruled that the project _____ -- the guy whose key opens the door only to those credits not being sold.

No, no, I agree with you. But what I'm saying is if you're tracking this for him and you're offering him one more service, is that something you want to consider. I just threw it out on the table.

It is one of the things I forecast, energy efficiency potential and it's one of the things that I quantify in each program design. So we know, SO₂, NO_X and CO₂ on every kilowatt hour that we say that we're saving so it wouldn't be a big – it would be easy, in fact it would be – we should do it. It's a no cost, yes, we should definitely do it. I agree.

But it doesn't necessarily mean money in your hand.

You know if you take a look at some of the new standards and one I was looking at particularly were the ISO standards and the 14000 series, a family of ISO standards. Most companies are familiar with ISO 9000 where they know they have to comply with the quality assurance standards to be able to sell internationally. Well, there's – the ISO 14000 are addressing environmental impacts and 14000 six specifically greenhouse gas. And so as companies want to sell into foreign markets in the future, if they're noncompliant they're going to find themselves isolated and out of foreign markets. So

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being able to prove greenhouse gas impacts through such things that you're talking about is very valuable I would think.

Larry, before we got in this discussion you had asked the question about the CSPs and how you would you bring them into this and whether you would do an RP and I just wanted to – in my head as you were going through the presentation, I was thinking through that issue, right. And if I read it right as you were going through the numbers you were projecting by 2012, 2013, 26 megawatt of available load in this program.

In those 3 programs yes.

Right. So I mean I think you just got to look through it and so if you outsource this to a CSP or a group of CSPs, what are the sales marketing costs, what are the operational costs versus the benefit of bringing in 26 megawatt of service load within this territory. And especially when you're looking at a 5 megawatt load under the residential program, which is where most of the sales and marketing costs would sit, to go out and achieve a 5 megawatt peak load by the year 2012, 2013. You've got to balance that out and say, what business model that does make sense under and how would you go about supporting an organization, a company that would want to be willing to take on that responsibility with dollars where would the – you know what kind of revenue would they get if they were wildly successful in this program versus the risks they'd be taking to dedicate resource to it. So as you were going through your presentation I was trying to run those calculations kind of back of the envelope and I think that's go to be the single biggest consideration when you think about how do you partner with a company who would take on that and what risks would they take versus what would the utility be willing to support.

And to build on that a little bit some utilities, if I'm on here, some utilities assume that marketing risk, if you will, and take the lead on bill inserts and direct mail and there is figures anywhere from 20 to \$25 per customer recruited to \$50 per customer recruited that they anticipate they would have to spend on marketing. Well, you can say well let's write a contract for the curtailment service provider, conservation service provider, we'll pay you the equivalent of \$50 per customer recruited and build that into the contract. But I was thinking more in terms of the larger because there is a pretty good market out there now for contractors that will provide at least for direct load control for air-conditioners in residential, there is some good experience now that's developed where that's contracted out. And under one business model the utility does the marketing, and under another business model the contractor does the marketing I think. But I was thinking a little more on the commercial/industrial side does Duquesne want to consider having multiple partners on that, or pick one under some kind of a competitive basis and use and work with that contractor as the aggregator, or how do we think through how

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best to get as many customers participating with as much load reduction as possible participating? I think that's kind of the goal cost effectively, how do we tackle that?

(inaudible) 13 megawatts. It's not worth you know and if you want to do an RFP that's fine, but somebody has to have the platform, you know the nominating bid, the dispatching reconciling platform. Once that's done, if you had you know 4 or 5 CSPs participating in that and all getting 3 megawatts; but you know you have to have a lead. You know that lead could work with other people, but if you didn't have a lead you know – I could speak for myself, I wouldn't be interested. I mean it's just too much work and too much effort, you would be better off – and that's what I was getting at early on. You'd be better off selling them into the PJM program for capacity. So what you would want to do is setup you know one lead CSP that Duquesne's reps are taking with them, and that CSP, and again I hate these terms because we are talking curtailment service provider as opposed to conservation service provider. Now in the afternoon when you talk about energy efficiency, that might be a different topic, you might want to have 2, 3, 5 whatever, and you might want to have specialists in lighting, specialists in HVAC, specialists in industrial as an example. B I think from a standpoint of the tradition PJM curtailment service provider it should be one, because this market is too small.

Pick one with the size of production that we're talking about. But if we went after 100 megawatts what would you say?

It would be different, that would be different. But 100 megawatts, that's – what is your peak load, 2000?

About 3000 megawatts.

Industrial is what percentage of that? The 900 accounts what do they represent?

About 21% of the energy.

One way to think about the potential is if Duquesne has got 3000 megawatts as their peak load and if the national opportunity is 5% of 3000, there is 150 megawatts potentially in our service area.

But my question was how much of that is industrial and commercial? I know you have the numbers somewhere, you just don't have it.

(inaudible)

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Yeah, the energy is 50% commercial, 21% industrial and the balance, roughly 30%, is residential. So if the load follows that. Not necessarily but you know in that area.

Pretty close.

Any other questions, comments, concerns. Was this helpful? It was certainly helpful to us, I can speak to that. Absolutely. I think – anybody on the phone have any final comments, questions, concerns?

Nothing additional.

Okay. One final comment by Michelle?

Yes. I just wanted a final comment, if you have any comments, concerns, issues you'd like to get back to us we have our website, it's act129feedback@duqlight.com. And that does come directly to me. So thank you again for your participation, we look forward to speaking with all of you again. Thank you.