

**Northwest Power and Conservation Council
Demand Response Advisory Committee
December 1, 2016**

Tina Jayaweera, NWPCC, began the meeting at 9:30. She welcomed the room, called for introductions and reviewed the agenda.

DRAC Charter

Jason Salmi Klotz, Oregon PUC, asked about the timeline for tool development to value and evaluate DR [Slide 6]. Jayaweera suggested that identifying barriers to development and developing policies/actions to resolve barriers [Slide 5] in the 2016-18 timeline would be appropriate. John Ollis, NWPCC, said some of this will be addressed in determining value streams but it's easier to design a tool after defining DR.

Rob Pratt, PNNL, noted the Council's paper that identified technologies that cross cut advisory committees like batteries or electric vehicles and asked if the day's discussion is limited strictly to DR. Ollis referenced the DR-specific goal of the DRAC, mentioning the Systems Integration Forum which will look at cross-cutting issues in the future.

John Wellschlager, BPA, referenced "Developing common definition" [Slide 5, bullet 1] and suggested changing it to "Developing common definitions" as DR comes in a variety of flavors, i.e. within-hour balancing, peak shaving, etc.

Attendee Share Out

Shauna McReynolds, PNUCC, represents IOUs and POUs in the region. PNUCC collects data on loads and resources and is interested in what data this body will collect.

David Nightingale, WA UTC, noted that WA UTC has looked at DR as a capacity resource and is interested in the value and integration of the resource. He hopes to tap DRAC expertise for help with IRP rulemaking.

Zeecha Van Hoose, Clark PUD, noted that Clark has participated in DR pilot programs with industrial customers and has a small water heater program about to start. She feels there is opportunity to support the region with I-5 congestion and provide tools for customer engagement.

Dave Costenaro, Applied Energy Group, stated that his nation-wide consultancy helps plan, evaluate and support DSM programs. He voiced interest in hourly and sub-hourly tool development.

John Steigers, Energy Northwest, described his organization as a public power aggregator of services and electric generation. He stated his organization wants to provide a pathway to public utilities that don't have the resources to participate in new technologies.

Tom Eckhart, UCONNS, stated that his company has participated in DR programs in CA and NY. His interest is in products and services that could benefit residential customers and has been asked by King County Housing Authority to look into projects.

Mark Osborn, Cadmus, noted his nation-wide consultancy's strength in M&V for EE and DR. He said he was brought on to assist in implementation, listing his accomplishments and his keen interest in interoperability.

Mike Hoffman, PNNL, listed his accomplishments and stated that DR is close to his heart as it encompasses systems reliability.

Rob Pratt, PNNL, stated that the Federal agenda is PNNL's primary focus but he brings detailed engineering skills about building energy consumption and DR to the group along with control and coordination schemes. He noted PNNL's work in building models both for end-use loads and the power grid. He called this work important to the National interest.

Bud Tracy, consultant, referenced his experience and stated he's interested in the value of DR and wants to see it pursued.

Josh Keeling, PGE, pointed to PGE's need for capacity and renewables. He mentioned the many DR pilots and programs presently running and stated that having the region on board drives momentum.

Adam Schultz, OR DOE, is the department's DR lead. He is interested in peak shaving benefits and a more expansive definition of DR in the medium to long term.

Jason Salmi Klotz, OR PUC, stated he wants to follow and add to the conversation along with gleaned ideas. He would like to see DR elevated to resource status and included in modeling efforts.

Bruce Lovelin, Central Lincoln PUD, described his company as a 38,000-customer utility on the OR coast. He is hoping to integrate system-wide and/or customer-wide DR projects and is interested in understanding the rate benefit to the customers.

Lee Hall, BPA, stated that Bonneville is building on program successes and learnings and expanding DR to distributed energy resources. He is interested in integration, referencing an integrated, demand-side management program which values and evaluates DR and DER. He expressed interest in sharing information, benchmarking and evaluation of the potential of the resource along with building partnerships.

Ahlmahz Negash, Tacoma Power, pointed to her expertise in pricing and valuing of DR. She stated that Tacoma Power hasn't needed DR but said there is interest in the technology.

Don Jones, Jr, PacifiCorp described the decade's worth of DR experience on the east side of PacifiCorp's system which equals about 300 MW. He said about 1/3 of that is on the customer side and the rest comes from irrigation customers. Jones said he's here to understand how this fits in the west.

Kyla Maki, MT DEQ/Energy Office, noted that Montana has little DR experience and the state's 26 Co-Ops and two IOU's offer different opportunities. She pointed to pilot projects and said her interest lies in defining DR broadly enough to incorporate the unique characteristics of rural utilities.

Carl Linvill, Regulatory Systems Project, stated that he has a long-time interest in DR and distributed energy resources. He also sits on the board of the Western Energy and Balancing Market noting an initiative to take up this topic in the CALISO.

David Lawry, Converge, stated that they are a residential DR provider and partner with utilities across the country. As a practitioner, he hopes to identify the challenges and barriers to DR.

Gregg Hardy, consultant, pointed to his EE research and policy work, referenced his experience with connect devices and noted the intersection between connected devices and DR. He stated he works with ENERGY STAR to help incentivize products to become DR capable.

Lori Moen, SCL, admitted that as a hydro-based utility they have little DR experience but want to stay engaged, follow the conversation and support customers with a few pilots.

Elain Markham, Puget Sound Energy, pointed to regional adequacy issues found in their 2015 IRP and noted that 121 MW of winter peaking DR would be a cost-effective solution. She plans on sharing information as they implement programs and joining the California ISO EIM.

Stuart Share, Navigant, referenced his company's work on the RPM which helped identify the importance of DR in the region. He noted his involvement in the Peak Load Management Alliance which developed a DR program design and training course.

Kevin O'Meara, Public Power Council, stated that DR is important to POUs and is here to help keep track of developments and progress.

Bryce Yonker, Smart Grid NW, noted that his group hosted a lively DR symposium which generated lots of interest. He offered to circulate a report from that symposium with the group.

Stan Price, NEEC, stated his company is a trade association for EE service providers. He said his interest is observing with a particular eye towards the integration of DR and EE.

Merrian Borgeson, NRDC, said that she is the lead on better planning for and valuing of DERs like DR in California. She stated that she hopes to learn and share information.

Suzanne Frew, Snohomish PUD, stated that they are starting their DR strategy and have experience with commercial/industrial customers and is exploring residential programs. She noted that her major concerns are where DR fits into winter peak and market changes.

Lea Fisher, Industrial Customers of NW Utilities, noted that she is tracking this process because industrial customers have substantial potential. She also wants to better understand barriers to DR.

Kevin Smit, NPCC, noted the overlap between DR and EE especially in load shapes and a Power Plan Action Item to develop data for them.

Carol Winkle, NPCC, stated that as part of the communication team she hopes to learn more to better engage the broader public.

Teague Douglas, CLEAResult, stated that she is working on DR and is interested in regional conversations about customer experience, evaluations and barriers.

Jennifer Light, NPCC, said as manager of RTF she is interested in exploring measures that provide both DR and EE and how the RTF can help define evaluation protocols. She wanted to be mindful of not duplicating DRAC work at the RTF.

Charlie Grist, NPCC, called attention to the similarities between the early days of conservation and DR. He said he's curious about how the Council's analytical capacity can help inform the issue.

Susan Haselhorst, ERS, said her consultancy is focused on the verification of EE and customer-side capacity management. She noted ERS's work with ConEd in NY.

Janice Bowman, Embertec, noted her work in EE and DR and the affordable option that her company's products provide.

Bob King, WeatherBug Home, noted that the company just changed names and is investing in connected home platforms. He said he's been interested in clean energy all of his life and sits on several boards.

Doug Samson, NRG Energy, pointed to partnerships with WeatherBug and Lockheed Martin along with 2.5 GW of experience with load under control. He noted his company's analytical and engagement tools and wish to keep engaged with the NW.

Bill Henry, EQL Energy, stated his interest is in creating common definitions as it will help with analysis and implementation.

Jeff Gleeson, Nest, said he was happy to share what the company has learned about residential DR, for example not calling it demand response. He mentioned successes in deploying regional DR and getting to Hard-To-Reach segments.

Chad Madron, NPCC, stated that he continues to want to be responsive to the DRAC's demands.

Elizabeth Osborne, NPCC, noted that DR touches on many policy issues in Washington.

Frank Brown, BPA, noted his work on DR since 1976. Jayaweera wished him a happy birthday from the room.

James Gall, Avista, pointed to past small DR pilots and the continuing use of DR as a capacity resource in their IRP. He hopes to study potential and looks forward to what the Council comes up with.

Mary Ann Piette, LBNL, noted that she runs the DR research center and has been working on open automated DR protocols since 2002. She discussed developing DR supply curves for CA, ways to value DR and new methodologies for forecasting DR. She offered to share the information and expressed her excitement with the results.

Quentin Nesbitt, Idaho Power, pointed to his utility's use of DR as a capacity resource since 2004, noting the 390 MW of DR considered a committed resource in their IRP.

Ross Holter, Flathead Electric, listed DR experience from the regional pilot: in-home displays, smart appliances and as a result chose an on-going residential water heater DR program. He stated his goal is sharing knowledge.

Tony Usibelli, WA Dept. of Commerce, noted his organizations interests: meeting greenhouse gas goals, improve electric grid and end-user resiliency and understand how DR fits in the State's investment in the Clean Energy Fund

Eckhart expressed approval that the DRAC includes regulators. He noted that there is concern that DR could negatively impact residential customers and the need to optimize customer interface.

King asked if the DRAC was exclusively looking at electric DR. Jayaweera answered that from the Council's perspective we are focusing on electric but we can discuss gas.

Hoffman noted that DR is old news for many people and noted the importance of connected, communicated devices. He also noted the need for new load research and an on-line version of ELCAP.

Ollis mentioned that in his past work, DR was looked at as just another resource and after his work on the Seventh Plan he became interested in how DR works within a utility. He expressed

interests in learning about the customer-side and the trading and scheduling market. Jayaweera said there is a lot to draw upon for future meetings.

BREAK

Sharing Demand Response Data

John Ollis, NPCC

Eckhart brought up recent RTF work that showed the value of capacity, noting that there is a fixed portion that is not counted. Ollis agreed.

Steigers called the origin of DR assets important when looking for barriers and potential. He suggested gathering the intended origin of the resource, be it residential, commercial or industrial. Ollis agreed but stated that he does not want to share commercially-sensitive data.

Nightingale questioned wanting 5 MW data, noting that some projects, like electric vehicles could be small but still reveal valuable information. Ollis clarified that the Council will take all data but was trying to be considerate of administration time. Nightingale suggested removing the restriction to free up the information flow. Ollis agreed.

Wellschlager stated that in order to make DR more commercial we need to push for more volume. He stated that 1 MW of information is invisible on the system and urged the room to find ways to encourage volumetrically larger amounts or people will be happy doing pilots for the next 20 years.

Keeling agreed but stated that the purpose of the data is to understand dispatch. He stated that he wanted big portfolios but didn't care if it came in small chunks. Wellschlager pointed to the difference between aggregated data and single-source programs that look at small amounts in isolation. Ollis admitted that he predicted acceptance and pushback to the 5MW number and suggested leaving it open for now.

Osborn stated that the Council is only looking at the transmission level and the distribution benefits to the system. He wondered if the feeder data to a distribution system that shows the effects of DR would be beneficial. Ollis answered that he is interested in all the data they can get to build a data warehouse.

Nightingale stated that distribution deferral of investments can be big on this resource and encouraged using feeder data. Ollis stated that the Council looks at distribution deferral credit for EE and was considering it for DR in the Seventh Plan. He said the Council is open to it but need more data.

Steigers voiced support for increased granularity, noting that DR generally comes in small pieces. Wellschlager agreed that aggregation is the future as it includes a large variety of loads but still puts something operationally meaningful on the table.

Hoffman asked when the cost of DR resources enters the conversation, noting that LBNL has good cost data. Ollis said cost will be looked at soon, but wanted to talk about definitions and classifications first.

Piette stated that the framework they developed in the cost data base is an open platform and is expecting DOE funds to make it national. Ollis read a question from the phone that asked if we are looking for cost data outside of the Northwest. Ollis answered that the Council is mostly interested in regional data but will also look at other data if it's not available locally.

Hall voiced agreement and stated that DR at scale is important for BPA purposes but acknowledged that DR at any scale is important for distribution offsets. He suggested delineating the DR by size and purpose but still look at the whole amount that is being developed in the Northwest. He then asked how we will get this information. Ollis stated that will be addressed in the presentation.

Keeling stated that notification time—how quickly you can dispatch a resource-- is a huge factor and asked if “number of hours contracted” [Slide 5, bullet 5] addresses that. Ollis answered yes, stating that he is looking for number of hours available and seasons available, agreeing that calling it “notification time” might be better.

Salmi Klotz understood that the Council wanted regional data but pointed to the value of lessons learned in program development, program evaluation and administrative challenges from soft data from other jurisdictions. Ollis agreed that there is value in this information and wanted as much as he could get. He then clarified that he is specifically looking for annual data that can be incorporated into planning and publicly show.

Hall offered a benchmarking study from across the US from 13 utilities and entities. Jayaweera stated that links to reports or websites can be published on the DRAC website. Keeling asked if we are looking at non-firm resources. Ollis answered that they want all of the resources and not limited to the firm-resources found in the Seventh Plan.

Jones stated that the Council asks for regional conservation progress reporting and suggested adding it to that. Light answered that the RCP information is collected over the summer which doesn't align well with adequacy work.

McReynolds noted that the RCP is a historic look back while the DR is forward looking. Ollis stated they will need a running total of both but agreed that the future look might be the most impactful.

Steigers suggested only considering the resource-buying entity and not the resource-creating entity to avoid double counting. Ollis called this a good point. Wellschlager agreed, stating that if something is acquired it is a real, not speculative, resource. Steigers encouraged the group to

keep a hard line between the DR and EE reporting. He agreed that there are many superficial similarities between the two but stressed that the methods and purpose are different.

Eckhart called that a good idea but stated that it puts a lot of the burden on the buyer and wasn't sure how it would work. Steigers cautioned against having multiple entities reporting the same one resource. He suggested seeing the resource and its use but not the pieces that make up the resource. Jones agreed that it made sense that the buyer does the reporting. Wellschlager added that the buyer has access to dispatch time, reliability and other relevant information.

Ollis stated that this makes sense for DR as a market product for peak shaving. He then asked how reporting works if DR is used for distribution deferral. Hall stated that distribution or transmission deferral depends on a peak-shaving product. Osborn stated that the key with distribution deferral is the peak may be at an odd time and unique to that transmission line. He suggested keeping the data separate and well explained.

Salmi Klotz suggested that the Council draft a strawman reporting template. Ollis agreed. Jayaweera asked if people want an on-line form or Excel noting that she would rather not have both.

Nesbitt expressed a preference for an Excel template and dissatisfaction with the word commercial as could be confused with commercial/industrial segment. Wellschlager added that we should agree on drop-down menus to ensure that data is bucketized correctly. Salmi Klotz suggested starting with an Excel sheet that can be added to and commented on to move the concept into something actionable.

McReynolds asked if there are any other places where this kind of information is shared. Jones answered that there is reporting on the East side of the system along with filling out WECC forms. He agreed that WECC is not very intuitive and favored Excel. Nesbitt agreed that this data is being reported publicly already.

LUNCH

Defining Demand Response

Steigers suggested adding ancillary services like frequency control to Ways DR can be used [Slide 4]. There were head nods of agreement. Ollis explained his intended broadness of the term "balancing" and the need for common terminology.

Wellschlager stated that from a trading floor perspective, reserves mean within-hour product balancing and/or contingencies. He advocated adding peak load management as a main bullet [Slide 4] with two sub-bullets: winter peak shaving and time-of-day transmission constraint management.

Fred Heutte, NW Energy Coalition, noted how the term DR is confusing as it defies traditional system management. He suggested thinking about it as a flexible or dispatch-able load and thinking openly about its value. Ollis agreed and asked the room to think about how the characteristics of a program translates into a value stream.

Negash referenced study by Navigant that found an emissions reduction benefit and a secondary benefit of accelerating coal closures and suggested they be added to [Slide 4].

Hoffman suggested the name Demand Resources.

Van Hoose said that, as a former industrial facilities operator, she found value in the non-dispatchable piece that encourages operating hour shifting. Keeling agreed, noting that customers value bill management, time of use management and things that technology enables. He stated that we may put them in for reliability purposes but they have ancillary benefits to the customer that should be captured.

Nesbitt stated that economic dispatch really means market price dispatch, noting that Idaho Power would have 0 DR if they were waiting for market prices to trigger the need. He stated that he's confused by having Economic Dispatch on [Slide 4]. Ollis agreed that economics might be the issue and dispatch has nested meanings.

McReynolds noted that the buckets of actions appear to overlap. She asked for a matrix of the kinds of resources and what they can do before going into modeling. Ollis agreed, explaining that part of the day's goal is to drill down into nuances and better define buckets.

Hall pointed to multiple value streams of the same resource which amplifies value. He cautioned against limiting resources to one bucket. Nightingale felt that [Slide 4]'s linear presentation inherently limits the value of the resource. He suggested using Venn diagrams or some other graphic representation to capture the full value.

Maki suggested integrating renewable resources as a value to add to the list.

Gleeson offered a thought on different value streams saying that he's seen DR and EE efforts work at odds with each other and suggested planning EE with DR from the onset.

Osborn suggested that DR assists with microgrids as it helps shed load. He stated that when a heat and power plant trips off line and dumps generation back to the utility it can trigger a significant charge. He noted that DR can mitigate some of that charge.

Hall noted that peak shaving often turns into load shifting and should be considered. Ollis agreed, calling it one of the concepts nesting in the term economic dispatch.

Steigers suggested defining DR by its attributes i.e. response time, notification time, duration, INC or DEC, firm or non-firm, where it's hooked up, etc., saying if you have a need you will look at a menu of what's available. Ollis called that a good list.

Dain Nestel, CLEAResult, stated that customer satisfaction is a key attribute and the group should address how to make it easy for the customer.

Costenaro noted that the DR resource comes with a time dimension. He suggested thinking about the time scale first and defining DR around that along with defining how granular--hourly, 15 min, 10 second-- the time scale gets.

Modeling Limitations [Slide 5]

Haselhorst noted that we are now talking about dispatchability noting that other resources could be used to manage load. She wondered if this is a definition break. Ollis called non-firm DR is just as valuable.

Pratt stated that we need to know how the size of the resource is estimated as a function of time of day or year as a 50MW space heater program is not useful in the summer. He asked to understand how this will be reported.

Henry agreed that dispatchability is an important distinction and aligns with other thermal or hydro resources that might need to be made for modeling.

Keeling asked that dispatchability not be a requirement of DR. He said that PGE considers time of use and pricing as DR. Ollis agreed that firm, non-firm and dispatchable and non-dispatchable are all part of the definition.

Osborn suggested thinking like an energy trader creating a transmission tag for DR. He acknowledged that there may be several different programs in the same BA that can be grouped and traded. He suggested building some programs into a transmission tag as a helpful exercise.

Heutte asked about speed [Slide 5, bullet 2]. Ollis answered that it's how many DR resources are represented in the model versus how long it takes for the model to run. Heutte moved to binning by cost, saying it will be difficult but necessary to make the model function.

Salmi Klotz stated that CA had similar issues and created a Generation Masterfile and suggested starting with that model. Ollis agreed, noting that staff models by thinking about obligations on the system. Salmi Klotz noted that in the Masterfile, attributes fit certain definitions that could be tweaked and used. He suggested getting in touch with John Goodin at CAISO for more information.

Key Value Streams for 8th Plan [Slide 6]

Wellschlager stated that DR creates another revenue source for the customer that can be significant as it helps the region sustain family-wage jobs.

Osborn pointed to grid resilience and disaster recovery as a value stream that is hard to evaluate.

Heutte suggested looking at value streams both internal and external to the grid. He stated that within the grid we can look at lower costs and security; outside the grid we can look at positive economic and environmental effects.

Eckhart asked about defining DR under the Charter and asked if key value streams fell under G and H in the document. Jayaweera acknowledged that G and H are about building out supply curves but this discussion is about defining DR within the framework of our modeling capabilities and use.

Keeling pointed to pilots that had a memo on how to approach DR cost effectiveness and offered to share it. Jayaweera said she would link to it on the DRAC page.

Pratt observed that balancing renewables is important. He pointed to the hard-to-quantify costs of acquiring emergency reserves quickly and suggested taking a stab at quantifying them for regional benefit. He noted opportunities to help balancing and ramping CA renewables and wants to do that without exhausting our DR resources. He then moved to wholesale value, noting that some BPA customers pay a monthly demand charge and will dispatch a resource to reduce the charge. He cautioned against possible double counting.

Steigers commented that [Slide 6] is well focused and the DRAC value is in finding information on other kinds of DR.

Heutte suggested looking at ancillary services like frequency response, voltage regulation, etc. and wondered where to draw the line to define DR. Keeling stated that these are still examples of DR. Ollis called this a valuable context.

Hoffman stated that he thinks voltage reduction and optimization is both DR and EE and wondered how you sort the values out. Ollis pointed to the nexus between DR, DER and EE might be addressed in the Systems Integration Forum. Jayaweera pointed to the RTF struggling with the same issues.

Hoffman liked Salmi Klotz's idea of a Generation Masterfile. Ollis agreed. Hoffman asked if the Council is looking at the value of ancillary services, calling it a big deal on most grid systems. Ollis stated that the 7th Plan didn't because the RPM didn't have a way to value it but did do a separate balancing and flexibility study. He said they would like to include it moving forward.

Ben Kujala, NPCC, agreed noting that staff evaluated the balancing, flexibility and value of DR on the narrative level. He noted the changes on the grid including CA renewables and thermal

retirements that needs better resolution. Kujala pointed to 7th Plan Action Items that called for better analysis. He also asked for better information on utilities' reserves.

Osborn stated that we should think about ancillary services in the value streams and functionality. Wellschlager noted that DR as a value to EE and a DR tool is sometimes mutually exclusive, pointing to distributive voltage reduction as an example.

Nightingale voiced approval for a Generation Masterfile and suggested going to a smaller, RTF-type panel for data going forward. He pointed to DRAC members who also sit or sat on the RTF who could help with thinking and the RTF's willingness to be a sounding board.

Nesbitt stated that Idaho Power is using generating resources as their deferral value while distribution value is much smaller calling them mutually exclusive.

Osborn asked to keep key customer value streams in mind when valuing DR which puts value on the marketing aspects. Costenaro added that there are other DR programs where you don't want the customer to know.

Grist pointed to Non-Energy Benefits and Non-Energy Costs of EE and wondered if there is a parallel here. Keeling agreed, pointing to TRC benefits.

Van Hoose stated that for Industrial customers there is no DR benefit to the customer. She stated that they are inconvenienced and noted that engagement is higher with EE but for DR the only benefit is the money coming in the door.

Heutte noted that the DR value for the end user looks different but argued that a combined package value from the utility can bring in more. He suggested thinking outside of traditional silos and addressing cross connections while avoiding double counting.

Keeling agreed but pointed to industrial and commercial customers who didn't monitor energy use until they started participating, calling this a customer benefit.

Eckhart stated that he thought that rate design balanced the cost of interruptions to industrial processes. Van Hoose stated that Clark PUD has a flat rate with a simple structure with no demand benefit. Keeling agreed that that made sense. Wellschlager spoke of a slice customer that had to lock schedules 30 minutes before the hour which sometimes causes them to pay for energy they don't use. He said they compensate them with a considerable monthly capacity payment.

Piette added that audits of large commercial buildings often find technologies that are EE/DR combined like controls retrofits. She noted that this works best in centralized and not distributed processes.

Lowrey moved the conversation back to value streams saying he sees it as what's on [Slide 6]. He noted that when the conversation gets too utility specific modeling becomes challenging, noting that the same could be said for the value of service lost to a customer.

Jayaweera asked if there is a way to quantify and value these areas in a way that can be modeled i.e. grid resilience.

Heutte spoke to looking at the value of lost load, noting that PacifiCorp looks at this for transmission planning. He admitted that it is hard to pin down saying that PJM has a hard time valuing DR even though it uses it to keep the lights on.

Haselhorst suggested that NY did some assessment of microgrids and offered the link.

Keeling noted his strategic asset management and T&D group uses a value of service estimate borrowed from CA which looks at the cost of loss of service from the customer perspective. He acknowledged that it is average values but called it a start.

Jayaweera noted that the Council looks at things regionally while some of these values are localized. She asked how to incorporate them.

Nesbit said that Idaho Power looked at value streams by asking what alternative resource, in this case a simple cycle peaker, would do the same work and start deducting from there to come up with the max value they're willing to pay for DR.

Ollis asked about diesel engines and asked for thought about comparing resources. Osborn answered that the question he grappled with is: is dispatchable standby energy a generating resource or DR, noting that the answer differed depending on who you talk to. He noted that DSG has benefits over DR: you don't have to get into customer's day-to-day operations but sell it as an improvement in reliability. He hoped this would lead to a DR platform as the infrastructure is in place to dispatch the load but pointed to pilots that found problems connecting to vintage equipment. He agreed that there is a duality to DSG. He stated that if air quality is good and you have customers with back-up generators why not use them as a grid resource as DSG is the lowest cost capacity resource on the system. He spoke of Intel's buy-in of DSG using it for lighting and HVAC.

Grist moved back to ways to value grid resilience noting INCs and DEC. He asked if DR gave more INC and DEC ability would it free up reserves which could be valued. Ollis asked the opposite question: how much does the amount used for peak open up the capability of the system to provide reserves.

Keeling moved to how to de-rate an avoided cost number noting that PGE struggles with the question. He stated they look at resource availability, how much notification time is needed and trigger conditions but he admitted that the numbers are made up to some extent. He stated that if the model is right you can still use it.

Heutte moved to Grist's question and stated that there is a difference between operational time and planning time when looking at reserves and different displaced resources will have different impacts i.e. a gas plant versus hydro or batteries.

Piette stated that she used E3's Resolve model with different levels of DR and solar for a CA study to find the value of DR.

Pratt suggested setting up analysis for different financial perspectives moving from BPA to the load-serving entity to the customer. He stressed that DR will not work unless it is at least neutral for all parties. He suggested then creating a money-flow map to guard against double counting.

Mike Starrett, NWPCC, noted storage examples where RTOs were encouraged to use smaller, faster responding resources for reserves and found that it freed up a portion of capacity. He then noted that WA UTC has a paper that looked into assigning value to storage that had many similarities to the day's discussion. The paper suggested looking to market data to provide a proxy value.

Nightingale moved back to Osborn's DSG discussion and asked if he looked at TRC costs at hospitals. Osborn answered that the value came from comparing it against Beaver 8 which was not in good condition.

Ollis asked the room to come back to definitions.

Heutte suggested adding better use of the existing grid. Negash suggested starting with the FERC definition and expanding from that. Hall suggested not starting with "new" transmission, or "new" generation as it might skew the conversation.

Osborn stated that the key differentiator of DR from EE is DR has a time frame which should appear in the definition.

Nightingale asked Lee to expand. Lee answered that we should start with the FERC definition: the reduction of demand for a period and purpose rather than what DR needs to do.

Heutte read the FERC definition: Definition of Demand Response: Changes in electric usage by end-use customers from their normal consumption patterns in response to changes in the price of electricity over time, or to incentive payments designed to induce lower electricity use at times of high wholesale market prices or when system reliability is jeopardized. He stated that we are talking about the value streams which is different.

Nightingale noted that BPA and the Council focuses on the transmission level while utilities focus on distribution and wondered if there should be two DR definitions or one that encompasses all.

Haselhorst noted that EE changes the forecast with a long timeframe that is a good tool for chasing loads. She stated that if you want to see a change in the forecast, DR is how you respond to that forecast.

Kujala noted that EE is not curtailment but DR could or could not be curtailment. He asked for comments. Tracy asked not to forget who the customer is: utility or a company or a farmer.

Steigers sees the distinction between EE and DR as intent. He noted that the intent of EE is to reduce energy consumption while DR's intent is to seek some other beneficial result over a specific time frame.

Piette stated that the three objectives of smart grid are a clean, affordable and reliable grid and DR can help with all of these objectives. She agreed with the discussion about EE and DR and shared terms from a CA study: Shape—response to prices, Shed—what we traditionally think of as DR, Shift—can be done with loads or storage and is energy neutral and Shimmy—which communicates load following and ancillary services.

Negash went back to intention noting that it is mentioned in the FERC definition.

Salmi Klotz stated that FERC 745 says DR must provide a benefit and liked the idea of identifying it.

Osborn moved to the curtailment aspect of DR saying that it's important and comes into play in microgrids more than big grids. Pratt wrote that curtailment excludes DEC's.

BREAK

Advisory Committees + Forum

Ben Kujala

Eckhart commended the day's conversation but noted that discussion didn't get into all of the barriers outlined in the White Paper. He asked if the DRAC will terminate after two years. Kujala answered that some advisory committees, like the RTF, have value outside of the power planning process and he envisions the DRAC in the same way. He noted that the committee will be around for as long as it's useful but as we move closer to the 8th Plan he hopes to see better supply curves and better information about potential.

Ollis asked about the Systems Integration Forum (SIF) on behalf of Pratt. Kujala stated that the SIF acknowledges the cross cutting between committees. He stated that the SIF is an opportunity to give due consideration to each subject in the Plan.

Closing and Next Steps

Jayaweera suggested that the DRAC meet quarterly. Heutte wondered if quarterly is enough. Jayaweera noted his concern and stated that more meetings can be scheduled if needed.

Jayaweera suggested meeting topics:

- RTF overlap with input from J. Light and RTF PAC
- Data Template
- Straw Proposal for a definition of DR
- Barriers
- CAISO Masterfile

Steigers asked if we should accumulate a library of resources. Jayaweera showed the Resources section of the DRAC page.

Wellschlager suggested staying focused and avoiding complexity so the results are implementable and doable.

Heutte suggested showing lessons learned about DR/DER from the Smart Grid Demonstration Project. Hall added that nine out of 11 utilities in that project had a DR component. He then said that there are research and technology gaps and pointed to a DR technology research roadmap noting that not every potential is equal.

Osborn suggested understanding the energy imbalance market as a topic. Linvill agreed.

Ollis adjourned the meeting at 4:00 pm.

Attendees on Site

Don Jones Jr.	PacifiCorp
Ahlmahz Negash	Tacoma Power
Lee Hall	BPA
Bruce Lovelin	Central Lincoln PUD
Jason Salmi Klotz	Oregon PUC
Adam Schultz	ODOE
Bud Tracy	Consultant, Idaho
Mike Hoffman	PNNL
Mark Osborn	Cadmus
Tom Eckhart	UCONS
John Steigers	Energy Northwest
John Wellschlager	BPA
Dave Costenaro	Applied Energy Group
Zeecha Van Hoose	Clark PUD
David Nightingale	WA UTC
Shauna McReynolds	PNUCC
John Ollis	NWPCC

Bryce Yonker	Smart Grid NW
Kevin O'Meara	Public Power Council
Stuart Schare	Navigant
Elaine Markham	Puget Sound Energy
Lori Moen	Seattle City Light
David Lowrey	Converge
Carl Linvill	Regulatory Assistance Project
Suzanne Frew	Snohomish PUD
Leo Quiachon	Energy Northwest
Merrian Borgeson	NRDC
Dain Nestel	CLEAResult
Teague Douglass	CLEAResult
Kiley Faherty	Puget Sound Energy
Kevin Smit	NWPCC
Lea Fisher	Industrial Customers of NW Utilities (ICNU)
Jeff Gleeson	Nest Labs
Bill Henry	EQL Energy
Doug Sansom	NRG
Robert King	Earth Networks/Weatherbug Home
Janice Bowman	Embertec
Charlie Grist	NWPCC
Josh Keeling	PGE
Jennifer Light	NWPCC
Mike Starrett	NWPCC
Susan Haselhorst	ERS
Gregg Hardy	Independent
Kyla Maki	MT DEQ/Energy Office
Stan Price	NEEC
Fred Heutte	NW Energy Coalition

Attendees via Webinar

Brian Dekiep	NWPCC
Brendan O'Donnell	Seattle City Light
Dave Backen	Evergreen Efficiency
Dave Warren	WPUD
Elizabeth Osborne	NWPCC
Summer Goodwin	BPA
Hossein Haeri	Cadmus
Jim Lazar	RAP
Kathy Moore	Umatilla Electric
Lars Henrikson	Seattle City Light
Lauren Gage	BPA
Megan Stratman	NW Requirements Utilities

Eli Morris	PacifiCorp
Carrie Nelson	BPA
Cory Read	Idaho Power
Deborah Reynolds	WA UTC
Danielle Walker	BPA
Frank Brown	BPA
James Gall	Avista
Will Price	EWEB
Tomas Morrissey	PNUCC
Tony Usibelli	WA Dept of Commerce
Rob Pratt	PNNL
Mary Ann Piette	LBNL
Quentin Nesbitt	Idaho Power