*[Speaker: Kristen Ardani]*

**Cover Slide:** Thank you everyone for joining us for today's quarterly meeting of the Distributed Generation Interconnection Collaborative, or the DGIC. My name is Kristen Ardani. I'm a solar analyst here at NREL and I'll be moderating today's discussion. The topic for today is: Improving Data Transparency for the Distributed PV Interconnection Process – Emergent Utility Practices and State Requirements.

**Slide 2:** But before we get started I just want to walk us through a few logistic. Participants are joined in listen only mode but please do participate and use the Q&A panel to ask questions concerning the webinar. We'll have a few minutes of Q&A between each presentation and then a longer Q&A session at the very end. To ask a question simply click the Q&A box in the GoToWebinar toolbar and type your question in the Q&A box. The webinar is being recorded and will be posted on the DGIC webpage following today's presentation.

**Slide 3:** So really the purpose of today's meeting is to look at emergent protocols for data reporting related to the interconnection process. And to look at how tracking and data reporting for interconnection requests is evolving with rising PV volume, and then look at two specific state contexts and examples, the first being Hawaii; an overview of Hawaii's recent efforts to improve the interconnection process and also to make interconnection data publically available.

And then hear an update on Massachusetts Service Quality Metrics for PV interconnection and how it's being implemented to driver faster interconnection time for PV.

**Slide 8:** So with that I want to take the opportunity to introduce today's invited speakers. First we have Emerson Reiter. Emerson is currently a project leader at NREL where he works on rate design, policy and utility-related topics. He's also involved with the Department of Energy's Tech-to-Market Program conducting research on and providing technical assistance for Island Nations.

Prior to joining NREL Emerson was with PG&E where he worked on analysis and advocacy within the CAISO wholesale energy market and supported the company's integrated resource planning process. He has a master's in atmosphere and energy and bachelor's degrees in environmental engineering and East Asian studies from Stanford University. So we will kick off today's discussion with an overview presentation from Emerson.

And then we'll hear from Joslyn Sato of HECO. Joslyn Sato is the interconnection improvement transformation lead at Hawaiian Electric. She has been supporting interconnection process improvement efforts over the past year and has grown a passion to helping the company and industry move forward. Joslyn is also pursuing her doctor of management in organizational leadership. And her passion comes from her moto: lead to empower, learn for a lifetime, and believe to achieve the unthinkable.

And then our last presenter for the day is Michael Conway. Michael Conway is Borrego Solar's director of grid integration based out of the New England Regional Headquarters. Though ongoing engagement and state level initiatives, Michael aims to influence technical standards and policies surrounding interconnection grid integration. Through those initiatives Mike identifies strategic pathways and highlights new market opportunities around the rapidly evolving intersection between distributed generation and the traditional grid.

Michael is a technical expert on interconnection practices across the country and is currently vice-chair of the Massachusetts Technical Standards Review Group. And so Mike today will be talking about some of his work for that Technical Standards Review Group or TSRG. So with that I want to turn it over to Emerson Reiter of NREL.

*[Speaker: Emerson Reiter]*

**Slide 9:** Thanks Kristen for that introduction and welcome to everyone. Good morning, good afternoon, or whatever may be applicable to you. So I'm going to lead off by setting the stage here with some background on existing interconnection performance reporting and what some of the benefits could be to reporting on timelines.

**Slide 10:** And when I'm talking about interconnection performance reporting we're talking about things that are specifically related to distributed generation mostly and what's going on in that space. So the agenda of what I'm going to run through: just a little bit of distributed generation context followed by some potential benefits of this reporting, and then profiles of the four existing reporting programs.

**Slide 11:** As background I think everyone in the DGIC is pretty well-familiar in what's going on in distributed generation at the moment.

But just to provide some additional context here I've put up two charts. On the left is the cumulative number of solar PV net

metering customers in the U.S. as reported by the EIA through their Form 826. And so this shows a really strong increase month over month in the number of net metering customers throughout the U.S. And this is a customer-driven kind of nationwide demand. And then on the right is the result of that.

So this is incremental net metering customers for the three California IOUs. In each month if we take the addition of a net metering customer as a proxy for a net metering application these utilities are processing 1 to 5,000 applications a month not counting ones that are rejected or withdrawn or things like that. These are just the ones that are completed. It's really indicative of what the processing burden is and how it's growing over time.

**Slide 12:** More applications can also lead to longer delays. And this chart is pulled straight from a paper recently published by our very own Kristen Ardani tracking how installations were making it through the processes in a number of different states. And so this table shows residential and small commercial installations and how they performed in the after-location review and approval timeframe across five different states.

What I've circled in the dotted lines here are the number of applications that actually exceeded the regulated requirement in these states. Her residential installations you're seeing percentages 40 to 60 percent are exceeding the timeline. And in the small commercial sector you're seeing something around 40 to 50 percent exceedance. This is the impetus for or one of the arguments for having a more open and standardized reporting process for interconnection timelines.

Now I'm going to jump into a few of the benefits here. I think we typically think of this type of reporting as just benefiting installers. They can get more systems out there.

**Slide 13:** But I wanted to mention that there can be benefits to a number of different organizations through this process: the utilities, regulators, installers, and customers. And this little graphic here is adapted from our blog on this topic. If you'd like to see a fuller explanation of what these benefits are explored a little bit more please check that out.

But I'd just like to talk through the sample ones I've pulled out here. For utilities the first opportunity is improving customer relationships by providing a more accurate estimate of about how long the process is going to take if this information is out in public.

And it's being drawn from to provide the estimate of service to customers that's beneficial to that customer experience. For regulators this is an opportunity to identify barriers to policy success.

If you're in a state with a solar carve out – RPS with a solar carve out or a DG set aside – and you're seeing through this reporting that interconnections are not being processed as fast as you thought they should be that's an early warning sign that hey maybe we're not going to meet our target. We might need to take some corrective action here. For installers having a better sense of about how long it takes to get a system installed might give you a better opportunity to schedule both labor and assets. Getting things to jobs at the right time could really provide some cost savings.

And then the last group customers could advocate for shared supply options. If customers can see that their neighbors or people in their local area through this reporting are either taking a really long time to get interconnected or being charged a really high fee is because the system needs to be upgraded every time someone installs a new system. They could advocate for a community solar or shared solar option and say, "We'd rather not do DG in our area because it's already a really high penetration and very costly. So let's go with another option.

**Slide 14:** I'm going to jump into quick profiles of the four existing programs. The first one is California and they have a kind of text-based report. It's the only one of the four that's aggregated up to the utility level. So you can see what's happening in each of the three IOUs areas. And they also have a unique emphasis on the screening process for applications. Each of the utilities reports what are the screens that are being filled most often by interconnection applications? And what are some of the possible remedies?

**Slide 15:** A little sample text on the right here from SoCal Edison's most recent report says, "Please indicate the top three most frequently failed initial review screens in descending order." These are some of the screens that are being failed by the interconnection applications. And then they've got a few suggestions for potential remedies as well.

**Slide 16:** The next program I'd like to mention is Hawaii. And I'll draw a distinction here. This won't be the one that Joslyn will talk about later.

This is a preexisting I guess Rule 14 program where it's more akin to the other states in that it's reporting on installations that have already occurred in the previous year. And this one tracks individual installation and the dates that meet your process milestones: when interconnection was first requested, when the application was received, when ECO conducted the technical review, and finally when the agreement was signed.

I think it's illustrative to look at some of the older formats.

**Slide 17:** I think this program has been in place since 2002 and had this older format in the top left where it's very text-based because there were three applications the first year that this existed. They only needed information on three installations. And most of those early ones were CHP combined heat and power facilities. And so as time went one, as the volumes of installations increased, eventually it evolved to this format in the lower right where it's table-based. It's listing the dates of each installation going through various phases. And it's also mentioning the capacity of each installation.

**Slide 18:** The next program I'll mention briefly is Massachusetts. Massachusetts has a spreadsheet format for the data and very specific geographic resolution. And it's got a very detailed timeline information as well. So it draws distinctions between more phases than several of these other reporting regimes. It also differentiates between utility and customer-driven time to complete stages.

**Slide 19:** I'll show a snapshot of the table here. On the left in the blue dotted areas you can see that not only does each installation have its own entry it's being identified by the town and city, the zip code, and even the circuit name which it's on. That gives really good resolution on the geography of these systems. And then on the right in red you can see the allocation of times to complete each phase by party responsible.

Some of these are taking longer because maybe the customer didn't complete the application for a while. Or maybe a few of these are taking longer because the utility needed to spend extra time with it. But you can see that the responsibility is being allocated through each of the responsible parties.

**Slide 20:** The final example is New York. And New York has kind of mixed formats for these. Each utility reports independently: some in spreadsheets, some in PDF. And they also track individual installations. But they also have a unique emphasis on the costs

that are charged for interconnection; both the cost of the utility and to the customer for both interconnection and system upgrades. And then the CSIR is a review process as well that some applications go through.

**Slide 21:** So when we look at data from New York most of the time – This is a sample from Con Edison in the Bronx area. Most of the time the interconnection time is zero. You can see some of these have $350.00 fees. I believe that's either for systems that aren't net metered or some of the larger ones that required details study. But you can see what I've highlighted in orange. These two 500 kilowatt installations are going to require over $100,000.00 in interconnection facilities to be installed.

That's interesting information to have and to keep track of as perhaps more and more systems are installed if the interconnection were a system upgrade costs start to rise. Right now they're mostly $0.00. But if they start to show up that would be indicative of coming system challenges or high penetration levels being reached.

**Slide 22:** We conducted kind of a qualitative comparison of these. I'll say for this table the idea is generally that more dots are better.

But this is a rough adaptation of our blog. Please go explore that if you'd like to learn more about what's being reported in each place.

Slide 23: And with that I'll say questions – please submit them – but we're not going to get to them right this moment. I'm going to hand it off to Joslyn to tell us more about Hawaii.

*[Speaker: Joslyn Sato]*

**Slide 24:** Thank you Emerson for that background and aloha to everyone across the globe.

**Slide 25:** Today I just want to talk about our continuous Interconnection Improvement Project. As we've seen there are a lot of changes happening and requirements for data and reporting going on. So today I want to talk about the development of our Integrated Interconnection Queue which is a new data reporting that we released this year.

And then also I'll share with you folks our current Interconnection Improvement Project.

**Slide 26:** Just to give everyone a little bit of an idea this is the percentage of customers that have PV currently in the State of Hawaii. As you can see some of the numbers are fairly high compared to others. But it also shows that there's a lot more room to grow which means that there are a lot more customers that can come through interconnection programs for us to continuously manage within our processes.

**Slide 27:** When looking at the different programs and processes and managing the installations we put together the Integrated Interconnection Queue. And the reason why it's called integrated is because it is a unified queue looking at all the projects at the distribution level that combines all requests, regardless of procurement programs. So this includes everything that qualifies under our Rule 14 process which includes the standard interconnection agreement, net energy metering, and a feed-in tariff.

We've brought all of the programs together and put them in one queue. Some of the key benefits we've realized immediately were that it provides better external transparency of application status and position for the customer, for developers, or anyone out there that's interested or in the current queue. It also allows for improved internal management of the various procurement programs because now that we have all the programs consolidated in this one queue we can also better manage our resources and look at different aggregate levels to understand what's coming ahead and what's already been implemented on the system.

There are many valuable benefits both internally and externally through developing this queue. And our first queue was actually published on January 31. It's being published currently every month.

**Slide 28:** So putting together a queue that's integrated that involves multiple companies and multiple programs this has many challenges. Several challenges include first we had to deal with three companies.

We have Hawaiian Electric, Maui Electric, and Hawaiian Electric Light. Just in any case companies have different interpretations different ways that they do things, different processes and workflows. There are also the multiple procurement programs that go through different requirement in workflows. In addition we have a lot of manual tools and resources available to us. So a lot of

the data collection and data sharing was very minimal because we didn't have the tools to help us be standard and consistent.

When we started developing the integrated queue we ran into a lot of challenges because of all of our differences in variance. We put together a team to figure out how best can we become internally aligned so that we can be transparent and provide this valuable data to the customer? First we looked at the existing processes. What existing data is out there and what reports internally and externally are we currently using that we can leverage so that we didn't have to start from scratch and we didn't have to spin our wheels to figure out how to get where we wanted to be.

So in order to do this and to mitigate the challenges of multiple companies and multiple procurement programs we've put together a joint collaborative session and a joint team which had representatives from each procurement program, each company, and each stakeholder involved in the process. We used a lot of in person collaboration as well as virtual collaboration so that we could understand and share best practices to help us get to an integrated queue.

Once we did the kind of data finding we developed standards. We look at what does that queuing process need? How can this queuing process work to include identifying a queue number and how applications get assigned this number and how they get placed in the queue. We also developed standard and consistent status codes. You know one of the challenges was there were different processes and workflows. And in order to be transparent and to report on an integrated queue you have to have data that's consistently captured, consistently formatted, and consistently reported across everyone.

So we developed standard status codes that represented the key points within the Rule 14 interconnection process. We also looked at other data content and format and had the tri-companies and all programs come into an agreement of standards and consistencies. Once we built the standards then we were able to develop the IIQ reporting process as well as identifying specific roles and responsibilities.

Again, because we have limited data sharing and manual tools it was important to develop one standard process that would be collected, consolidated, and reported. So this actually took a lot of time, a lot of communication, and a lot of training for the SMEs as well as the call centers so they could be ready to guide customers

through the IIQ on the website or answer any questions regarding the IIQ.

We also did share some external awareness with the solar providers so that they too knew that there was this tool out there that could be used. It took about a five-month period for us to get all the data collected, established, all the foundations to begin reporting in January.

**Slide 29:** Some of the IIQ features: initially when we first started developing the IIQ because there were so many challenges we did kind of think about some of the formats that currently exist – looking at just the spreadsheet or an Excel. But we really wanted to bring that value and that transparency to the stakeholders. We looked into building a more interactive type of format on our website. At the bottom of my screen you can see that there are several links.

Feel free to go to one of the links and look at the IIQs and play around with them in person. Again these are posted every month on each company's website. We do have three: one for each of the companies. It does allow for searchable fields and each field when you hover over it does have a clear definition of what it means. We have thinks like the queue position, and agreement ID. And the agreement ID is what we provide to the applicant.

That's the ID that they can use to search for their application in this queue. We also list the procurement program project developer ID number. Now this number is something we also had to improve and create during our project. We wanted to allow developers to search for all of their projects that they currently have going through the process. And we didn't want to have their names out there to prevent any type of competition or just to again have that transparency and let them see what information is there.

We established a process to assign project developers and an ID number that they would get told when they sent in an application. And then they could go to the queue, input that number in the filter search, and all of their projects would pop up. They could easily see where all their projects were at at one time. We also list the system size and then circuit name. I'll get back to the circuit name. Review status: the review status is this status code that we developed across the companies to measure where in the process – against the Rule 14 steps – that a customer was in.

You may see that there's this CAR code. And what this code represents is that the customer has an action that's required. So we

wanted to make sure we highlighted Customer Action Required so that when the customer looked at their status they knew that we were waiting on something for them, whether it was another document, or information. It was kind of like a reminder so they could touch bases with the company and check in if they weren't clear what they were missing or to let us know that they've submitted it.

We did want to start to put in codes that show the difference between the customer action and the utility to again bring that transparency and help everyone be more involved in the process. Then we have date interconnection application received, date determined completed and valid, and then several columns that would indicate if a project needed to go through an interconnection representative study – so when it started and when it was complete.

These fields were actually leveraged off of a previous report that we were submitting to the commission reporting on IRS projects. We kind of leveraged both reports so that the resources wouldn't have to pull separate data, that they could pull all the data at the same time that could be sufficient for multiple reports.

The IIQ on the left side is actually the entire queue for each company. You could look and you'll see that there are thousands and thousands of pages. You can look in there and see where you are in the entire queue. Then when you click on your circuit or if you search by your circuit name what would pull up would be the circuit queue position. This tells you on your circuit this is the number that you are in line to go through the process.

You could easily know where everyone's at before you if everyone's in an initial tech review stage. If you're just thinking about entering interconnection process you could actually search through your circuit name and see where a customer is at. If it shows they're in a supplementary view then you kind of have the expectations knowing that when you submit your application you're going to have to go through that review stage.

This circuit queue position actually provides the customer a little bit more predictability and expectation of where they're at and what to expect when going through the interconnection process. If the customer does not have an application in and they wanted to check their circuit queue position we do have other tools on our website like a locational value map that allows the customer to punch in their street address. We'll provide back the circuit name so that they could use this tool to again search and get that

understanding of where things are at in the entire queue or on their circuit.

**Slide 30:** So by doing that we did actually get a lot of good feedback that it did provide this data transparency. It does allow the customer to have this prediction. But we feel like there's so much more we can do with improving the way the interconnection process moves, the data transparency. We created a program called the Interconnection Improvement Program. And basically what this program looks at is interconnection success and balancing the customer experience and program performance.

To do that we need to look at the people process and technology and make sure that the people process and technology are adaptable and flexible to the future of what interconnection holds. As we all know there are many changes and unknown forces coming ahead of us that we need to always ensure we can adapt to and be flexible to continue to allow customers to achieve their interconnection needs.

The program focuses on several items. First it's mainly to improve the customer experience. Again going on just the reporting of the IIQ but looking at the entire interconnection process, and establishing tri-company program consistency and standards. Also gaining that great transparency and guidance. The IIQ was just the first step for transparency. And we plan to expand more transparency and guidance and education for the customer and stakeholders.

We also want to implement an enterprise end to end tool. And what this tool will do is allow for online functionality and process efficiencies from application intake to tracking application status as well as workflow management and automated communication. Data integration and automation for application processing and technical assessment would also be achieved through an enterprise solution. So again it's having one source to pull data that's needed and then share the data throughout the process with the necessary stakeholders.

We also want to improve data management. Looking at value added metrics, value added reporting, and allow us to have the data to do more proactive planning. A lot of times we've noticed that we've been doing reports and producing reports based off of different individual needs or requirements. And so when we did the IIQ the first step it was to look at what can we leverage that

were already doing? And we did find a lot of overlap in the different datasets that we were capturing amongst different reports.

The goal for the IIP – which is the Interconnection Improvement Project – is to find value added reporting, to do a little bit more consolidation, and be able to streamline and capture data that's meaningful to the user. And last is to establish joint problem solving and collaboration. The interconnection process involves many different stakeholders throughout the process both internally and externally.

Each person has a need and a value that's meaningful to achieving interconnection success. In addition each person brings different perspectives and expertise. So we want to establish joint problem solving and collaboration not only internally with the company departments and across the tri-companies but also externally with the other utilities amongst the industry with people like NREL and the DGIC as well as our Commission and other stakeholder partnerships.

We're all facing the same challenges and issues as well as expectations with interconnection that together we can build through lessons learned, broader standards, more innovation, and better products.

**Slide 31:** So in looking at specific to the data of interconnection in the future we've uncovered that real time information with greater details will be what's needed both externally for communicating to the external stakeholders as well as internally for us to be more proactive in planning and making better decisions.

First is to look at collecting the data, you know understanding the various data sources – where are the data coming from – in order to meet the needs of the program and the technical. Also using and sharing data, looking for real time information on application status and progress, finding the solution so that we have real time data that we can share this real time data seamlessly throughout the workflows.

And also by having data in a common source that can be automated and easily shared we can then look at more frequent reporting to bring in that transparency with greater detail. Also one thing with data is making sure it's validated and using the data to validate the things we do. Using the data to proactively understand and assess the process performance as well as the application's progress. So that we can make effective decisions,

establish baselines, and compare against any key metrics that are important – going back to the interconnection success – and also being able to set better expectations for the customer when they think about applying for interconnection.

Data can also help us continuously improve. By having real time data, data that's shared, data that's commonly used and validated we can then be more proactive in where we spend our resources in making those improvements both on the program administrative side and the technical side. And it does allow for more proactive planning. So again it's leveraging data so that we can be that one step ahead in achieving interconnection success.

**Slide 32:** Where the Interconnection Improvement Program is going is we're really focusing on the quality of data, finding that data needs to be valid, accurate, consistently collected, and timely collected and shared. And it needs to be complete. So we're going to look at how we collect and manage data consistently by first again going back to the end to end software solution.

Finding a single solution that would collect and manage data for all procurement programs related to interconnection, then developing data standards. Looking at the data format, the data definitions, and what data is valuable and meaningful, and establishing those standards across the companies and programs.

Next we're also going to share and integrate data across the company, looking at that automated workflow between the various departments and automated data sharing and validation. Again it's looking at sharing the data using the same data so we all can be more proactive in making effective decisions, and also using the interconnection data to integrate with other systems throughout our utility and process areas.

And then improve in reporting. Looking at collaborating with internal and external stakeholders and the reason why we want to collaborate is to truly understand the data needs that each of the stakeholders are looking for so that as the utility we can provide data that's valuable and meaningful to meet their needs and present it in a way that they can understand and use it to help them make best decisions.

We also want to consolidate and improve our existing reports. As I mentioned during the IIQ development we did uncover that we're doing many reports internally and externally that sometimes overlap with the data that's being communicated. It allows it to

identify valuable and meaningful data and determine interconnection KPIs.

So in looking at interconnection KPIs it's not only citing those key performance indicators internally with the Hawaiian Electric companies but also reaching out externally through the industry to understand if we have some common and standard Key Performance Indicators that we can all kind of leverage each other against. So that when we come into these collaborative sessions we have a baseline on data performance and programs.

The Interconnection Improvement Program is really looking at getting that data because data is a critical piece of interconnection. To keep all stakeholders interconnected with the challenges, progress, performance, and outlook of where an individual project, the community, the company, or industry is going. So by focusing on data and having data available to all the stakeholders not only can we be proactive as a utility in establishing better programs and better processes, but also understanding and meeting the customer needs.

Also on the other side is that now we have more transparency for the external providers to understand the interconnection process, their application, and how else they can help within the process to be successful as a whole on interconnection.

**Slide 33:** We have a lot ahead of us but we're very excited to know that the Interconnection Improvement Program is looking at all these various factors in interconnection and has the opportunity to leverage all the expertise out there to help us together build an improved program and improved process for the customer, for the utility, and the industry.

Thank you. And if anyone has any questions –

*[Speaker: Kristen Ardani]*

Yeah that's great. So at this time I'm not seeing any immediate questions popping up in the Q&A box. But I do encourage folks to go ahead and put your questions in there. And then we can field them all at the very end. Please give us your questions in there and then we can move to a discussion. But first let's go ahead and introduce Michael Conway. Mike if you would like to go ahead and take over control. There we go, perfect. Thank you.

*[Speaker: Michael Conway]*

**Slide 34:** All right great. Thanks for having me. All the way from Hawaii, now it's up to Massachusetts where it's still 50 degrees in early June. But I sort of like the symbolism of crossing the country here and understanding that we're all facing the same challenges regardless of where we are in the country.

**Slide 35:** Like Kristen said I'm going to present a bit today on Massachusetts' new, but implemented Timeline Enforcement Mechanism for the interconnection process.

It goes up from the date of application to the day that an Interconnection Service Agreement – ISA as we call it in Massachusetts – is delivered from the utility to the customer. We'll start out with just background on the great story of how this Timeline Enforcement Mechanism was dreamt up in the DG Working Group. I'll do a quick overview of how it works – the penalty and object calculation itself, as well as how the information is validated between the utility and between the customers.

And then I'll finish up by taking a look at how we're doing today. We just had a short cycle for 2014 come to a close. So the utilities have filed their enforcement mechanism results for the end of last year even though it was a short cycle. We can take a look at how they did in that year and measure that against what we're seeing in the DOER tracking spreadsheet trends that Emerson showed us in the first part of his presentation.

Starting out with the background the Timeline Enforcement Mechanism pretty closely mirrors a Service Quality Metric although it is not a Service Quality Metric exactly. It's been in the works since Massachusetts issued its new interconnection tariff back in 2013 which was the end result of a summer negotiation throughout 2012 between the DG Working Groups. That was a group of stakeholders from the utilities, stakeholder parties from solar and wind and combined heat and power in the State of Massachusetts as well as the state through the DOER.

To say that the DG Working Group document was a negotiated document is – You know the term "negotiated" is a little tricky but it's probably more appropriate to say that it was a group effort. And as with any group effort concessions were made on each side. And one of I think the primary concessions made by the utilities was to agree to a Timeline Enforcement Mechanism, understanding that through the same process their interconnection

timelines for how long they'd be treating applications got much longer.

And the interconnection application fees also were increased pretty significantly. Just a few important housekeeping notes to start out with. I'm trying to go to the next slide.

**Slide 36:** Okay there it goes. DPU1175F was the actual order for installing the Timeline Enforcement Mechanism. I'll just go through a couple of the quick highlights here. It's based on like a traditional Service Quality Metrics – the metrical penalties and offsets five percent deadband so that any sort of activity surrounding that median point is forgiven.

The metric is based upon performance in mostly all product types, although there are some that are not included. I'm going to go through those exclusions at the bottom here. The maximum penalty or offset is determined by the amount of application fees that are collected by each utility in that same performance year. If it's been a slow year for the utilities and they're not collecting a great amount of interconnection applications, and not collecting the fees that go along with that, then their exposure for a penalty or their ability to gain an offset has decreased in that year.

And on the other end if it's a really heavy year then they have the opportunity to earn a greater offset or be exposed to an even greater penalty. The weighting for the application types was designed to emphasis expedited and standard projects. For those folks out there who speak sort of in the common tongue of California – Rule 21 – expedited is sort of our Massachusetts version of fast track. And standard projects are sort of – You're a standard project with a detailed study.

Other highlights: any offset that the utility earns goes towards the next reporting year. And after that it expires. The Service Quality Metric or the Timeline Enforcement Mechanism preserves the existing refund policy which was installed in the newer version of the tariff. It states that for any individual application if the customer feels that their application is outside of the timeframes allotted in the tariff they can request that their application fee be refunded by the utility.

There's a small accounting period that goes on after that request. And if it turns out that it actually has been outside of the allotted time period then the application fee is refunded. The Timeline Enforcement Mechanism preserves that, although every project

that applies for and is rewarded its refund is then excluded from the greater metric as to not sort of double dip on the utilities with those projects.

As for where any penalties eventually end up the penalties are transferred into the Commonwealth of Massachusetts general fund. They may be refunded or they may be refunded to the rate payers in the end. And there's a mechanism built in for the DPU after the first year to review the timelines, review any of the specifics of the enforcement mechanism, understanding that this is sort of a maiden voyage and may need some tweaks in year one, year two, year three, or whenever it would be appropriate.

Just going over a few types of projects that are excluded from the metric are expedited applications with supplemental review. Again that's sort of the fast track type of project that – There are two different types of expedited projects in Massachusetts. You have an expedited track that sort of splits in two different directions. One of them is no impact study. And the other includes a short 20 business day supplementary review. That was new with the tariff.

The rationale here is that the utilities didn't have a lot of experience really benchmarking how long that supplemental review would take. And we agreed that it was fair to leave that out of the metric for the time being. Also excluded are Simplified Spot Area Networks simply based on not having a lot of experience with again doing that type of study. Applications with timelines by mutual agreement; that one is sort of self-explanatory. And group study projects which are also fairly new in the new tariff.

And just a small note at the end any projects that are excluded from the Timeline Enforcement Mechanism are still subject to reporting through the standard DOER reporting mechanism. We'll go to the next slide.

**Slide 37:** All right so moving on to just a quick example of how this enforcement mechanism works; I'd first like to highlight that the different types of products are weighted differently to sort of focus on expedited and standard projects. The rationale is it's pretty – The utilities have simplified applications. Or you know the screening tools for simplified applications are pretty well worked out. The authors of this Service Quality Metric didn't want to sort of dilute the message by overvaluing simplified.

What we ended up with was 20 percent simplified and 40 percent for both expedited and standard. There's an example in the table below that walks through sort of an arbitrary example of a situation where we're one day on average over time for simplified, about 9 days over time for expedited, and 7 percent over time for standard. We'll go to the next slide.

**Slide 38:** The penalty and offset calculation is rounded to the nearest tenth of a percent around the five percent dead band. Using that same example on the first page after the waiting was completed we had an average timeframe of 111.8 percent over the 100 percent nominal. The penalty or offset itself would be calculated by taking that average time and subtracting the dead band for a period where there is no penalty or offset and then multiplying that by total gap.

In this instance you'd take your 11 percent, subtract 5 and those are the figures that were used for this trial balloon at $1.4 million. For a utility that collected application fees totaling something on the order of $700,000.00 you know you have a cap two times that. You'd be up in the $1.4 million range. And your exposure for underperforming by 11.8 percent would be $960,000.00.

I just ran through another quick example here to sort of illustrate the area just around the dead band. In this example we've got a weighted average time of 5.3 percent. And when you consider the dead band around that you're really one-third of a percent outside of that. Using that same calculation against the maximum penalty the penalty would be $42,360.00.

**Slide 39:** Okay so digging deeper on how the utility communicates this information with the customer and how the data is validated going to its reporting. At the end of each project once the ISA or the Interconnection Agreement has been delivered the utility will send out this – This is one from National Grid. Each utility will have their own. It sends out a data validation which – I called out a few important items in here: the days allotted for the tariff but based on which track you're using, if you're simplified, expedited or standard.

This was a standard project so 105 business days. The date that they received your application and the date that your ISA was delivered, sort of the bookends of your project against which you're being measured. And then at the bottom you've got your actual days elapsed. Really we're measuring this bottom figure – actual days elapsed – against the days allotted in the tariff – the

first one. In this instance 135 business days elapsed on a 105 business day basis.

On the customer end if you're being thorough you're tracking these timelines on your own as well. If you had an instance where a utility said, "It only took us 95 business days to finish your project," and you know, "Well our records show that it was actually 132 business days." You'd be able to dispute that and do some accounting with the utility to sort of work out where the discrepancies are in both of your records.

And if you don't reply to the e-mail then the utility's record of the accounting is what ends up going into the tracking system.

**Slide 40:** All right so now I just wanted to do a couple quick slides on how we're doing right now. I grabbed these graphs from the DOER reporting website that Emerson linked earlier in the presentation. I grayed out the middle because I was trying to – So what I've got here on the first slide is 2009 through 2013.

**Slide 41:** The next slide I have the past year: 2014 to 2015 just to sort of benchmark how we've improved as a market or how the utility has improved in performing their reviews of the applications. In the earlier one I've blocked out this middle period because some of these earlier years there was no such thing as an expedited project with the supplement review. I felt that was not indicative – that that was damaging the data. I took that out here.

Mostly we're seeing underperformance from 2009 to 2013. On the 2014 to 2015 slides we see sort of a good improvement in the top track which is expedited projects without supplemental review. And that is an area that we in the TSRG have really tried to focus on expanding and getting more and more products into. As an example last year we were able to raise the minimum load screening for projects that are being booted from expedited into standard.

Originally that was that 67 percent – you know the aggregate kilowatt (KW) size of the application was more than 67 percent of minimum daytime load then you would have to go to standard. On the heels of the FERC S-chip we were able to move that 100 percent. And really what we're trying to do is just keep more projects, larger projects, in the expedited process which sort of helps with project velocity and helps with the strengths of the market.

It's good to see that in the past two years that the utilities on the whole have been over-performing in that expedited path.

**Slide 42:** And for this last slide, just wrapping up, I wanted to share the results of this – as I call it – short cycle first reporting year. The Timeline Enforcement Mechanism was actually approved in July. This went into effect late last year. You know the data was reported on for that short amount of time that last year's reporting year was open for.

In the utility findings that have come through in the past week or so we're seeing that all of the utilities have earned their maximum offset which means they have by over 15 percent outperformed the tariff timeline. Based on the graphs on the previous page and just by sort of our gut instinct of having done a lot of business in this area it was a bit surprising. Some possible contributors to that are the Timeline Enforcement Mechanism happened to go into effect at sort of a funny time in the PV market.

Even though the interconnection tariff applies to PV, wind, CHP, all distributed generation the great percentage of products are PV projects. In Massachusetts we had our incentive program – SREC 1 – come to a close in the early summer and sort of a sluggish development time before the regulations for SREC 2 were released. It just sort of happened by coincidence that this short cycle of the timeline enforcements just aligned itself with a naturally slow development time.

That seems to have resulted in the ability to aid in the utilities in performing very well against the tariff timeline. We'll certainly be interested to see how the reporting comes out for 2015 but you know hopefully the timeline enforcement and the service quality style of it has helped it improve optics within the utility itself and drive resources to sort of be working on interconnection applications in a way that they hadn't in the past and that we continue to see the utilities outperforming their timelines.

That would be the best case scenario. That's about all I have. I'm free to open it up for questions or whatever else.

*[Speaker: Kristen Ardani]*

**Slide 43:** Thank you so much for that. So also with that I would like to thank everyone for their participation and time today. And a heartfelt thank you to each of our speakers for sharing their expertise and insights. Again today's webinar will be posted on the DGIC website in addition to the blog that Emerson mentioned

which does a deeper dive in comparing each of the publically available data platforms. It goes into greater detail in each of the items that are tracked and reported.

So I encourage all of you to check that out on the website as well. And thank you so much and again looking forward to our next meeting. With that I'll sign off and look forward to the next time.

*[End of Audio]*