

STATE OF NEW JERSEY
BOARD OF PUBLIC UTILITIES
MONDAY, SEPTEMBER 24, 2018

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ENERGY MASTER PLAN
STAKEHOLDER MEETING

BUILDING A MODERN GRID

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HELD AT:
MERCER COUNTY COMMUNITY COLLEGE
CONFERENCE CENTER AT MERCER
1200 OLD TRENTON ROAD
WEST WINDSOR, NEW JERSEY
10:00 A.M.

BEFORE:
MIKE WINKA - BPU

COMMITTEE MEMBERS:

BPU:
MICHAEL L. HORNSBY
GRACE STROM-POWER
SARAH BLUHM
ROSEANNA MILAN
JAMES BOYD
JOSEPH COSTA
CHRISTOPHER OPRYSK

DEP:
RUPA DESHMUKH
RAVI PATRAJU
JORGE REYES
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1 MS. POWER: Good morning everyone. My
2 name is Grace Power. I'm the Chief of Staff at the
3 BPU. And, I'm the Chair of the Energy Master Plan
4 committee.

5 Thank you for joining us today for our
6 fourth stakeholder meeting. We have one more
7 scheduled for this Friday, I believe, also here at
8 Mercer County Community College. We have heard a
9 lot of interest in actually holding additional
10 stakeholder meetings in North Jersey and South
11 Jersey. And, so, we are actively looking into
12 whether we're going to add one to two additional
13 meetings that would be on the general topic, before
14 the comment period closes. So, stay tuned for
15 that. Please make sure you signed up so that we
16 have your e-mail address and we can keep you
17 informed as to what we're doing. We also do update
18 the website regularly.

19 So, as many of you know, the 2019
20 Energy Master Plan planning process kicked off when
21 Governor Murphy signed Executive Order 28 in May.
22 It directs the BPU to spearhead this process, which
23 is an inter-agency process primarily. We have many
24 representatives here from across the state. And,
25 essentially, our committee is tasked with

1 developing a blueprint for the total conversion of
2 the state's energy production profiles, 100 percent
3 clean energy, by 2015. We are also actively
4 looking to come up with exact specific proposals as
5 to how this will be implemented over the next ten
6 years.

7 Hopefully, many of you are familiar
8 with our timeline. In June we held our kick-off
9 meeting, at which time we split into five working
10 groups. We are holding our stakeholder meetings
11 now and in October. This winter we hope to have
12 -- we wrote up a draft document that will be
13 released to the public some time late winter/early
14 spring, at which time we will have additional
15 stakeholder and public comment period, and
16 opportunities for you all to weigh in and be
17 involved. And then in June of next year, we will
18 deliver the final plan to the Governor.

19 A number of departments, as I
20 mentioned, that are involved in the EMP, including
21 BPU, DCA, EDA, DEP, Health Human Services,
22 Transportation, Labor and Work Force Development,
23 Treasury, and Transit.

24 I'd like to welcome Mike Winka up to
25 introduce his team. Before I do so, I just want

1 to mention, the next meeting is this Friday at ten
2 a.m. And, again, we may be adding one to two
3 additional meetings. And, again, on behalf of
4 President Fiordaliso and Governor Murphy, thank you
5 so much for being a part of this process today.
6 Mike?

7 MR. WINKA: Thank you, Grace. So,
8 there's about fifty folks here. There's about
9 forty folks that are signed up. So, if it's okay
10 with you, we're going to sort of plow through
11 without a break, if it's okay with the
12 stenographer. See if we can get everybody through
13 before lunchtime, and get everybody out back to
14 work.

15 With that, I'm going to open it up to
16 the folks on the committee to introduce themselves.
17 And since we have a shortage of chairs up here, we
18 have some folks on the committee that are sitting
19 in the audience. So, why don't we do them first.
20 Just speak up loud enough for folks to hear you.

21 MR. OPRYSK: I'm Christopher Oprysk.
22 I'm an engineer with BPU.

23 MR. COSTA: Joe Costa with the
24 Division of Reliability and Security at the BPU.

25 MR. HORNSBY: Mike Hornsby with the

1 BPU.

2 MR. WINKA: And we'll start with Sara
3 on the end.

4 MS. BLUHM: Sarah Bluhm, BPU.

5 MS. MILAN: Roseanna Milan, BPU.

6 MR. REYES: George Reyes, Department
7 of Environmental Protection.

8 MS. DESHMUKH: Rupa Deshmukh, DEP.

9 MR. SALMI: Chris Salmi, DEP.

10 MR. LIKE: Russ Like, Economic
11 Development Authority.

12 MS. PATRAJU: Ravi Patraju, DEP.

13 MR. BOYD: James Boyd, BPU.

14 MR. WINKA: Mike Winka, BPU. And, so,
15 as I said, there's forty folks that have signed up
16 to speak. Typically we would set about a
17 ten-minute time limit on speaking, but we're not
18 going to enforce that strictly. But, keep your
19 comments succinct. If you've commented before,
20 just summarize your comments if they're new
21 comments in regards to this issue, and just a
22 couple of points on this issue.

23 So, the last three sessions, the Clean
24 and Renewable Energy -- and, we are not the Clean
25 and Reliable Transportation section, we are the

1 Build a Modern Grid -- but close, since you need
2 transportation to build a modern grid to get from
3 place to place. So, that section, the Clean and
4 Reliable Transportation and Reducing Energy
5 Consumption, those were all about helping us set
6 the goals that we need to in the Energy Master
7 Plan. And, the Energy Master Plan is planning for
8 a ten-year horizon through 2030. We're close
9 enough to 2020 to be 2030. This session, and the
10 one that follows, that's going to be chaired by
11 Cynthia Holland -- up there -- running the
12 sustainable infrastructure. This section and the
13 next one is all about how we deliver those goals to
14 the customers, that you in your home and your
15 businesses. And, this session specifically on
16 building the modern grid is on the distribution
17 energy systems. The interstate sort of structures,
18 the things we regulate within the state -- although
19 not just what we regulate at the Board of Public
20 Utilities, and the Board of Public Utilities is the
21 state energy office which is charged with
22 delivering energy, security, and reliability and
23 assurance. And, we do an energy assurance plan --
24 and Joe Costa is one of the folks that do that on
25 at routine basis, along with the Energy Master

1 Plan.

2 So, these, the things that we're
3 talking about today, building a modern grid on the
4 distribution energy side. And, it's not just the
5 electric grid that we're talking about. So, it's
6 the distribution energy systems. How do we deliver
7 electricity, natural gas, all the other fuels that
8 are part of the distribution system within the
9 State of New Jersey. On Friday you'll here from
10 Cynthia on the transmission energy side, the
11 interstate system, the things that are regulated
12 more by FERC. So, today is the distribution side.
13 On Friday you'll hear about the transportation
14 side.

15 When you're addressing your comments
16 in regards to the modern grid, there are the things
17 we need to do to get to 2030, over the next ten
18 years, and how we build out that grid. But, we
19 should also be focused on the two long-term goals
20 that are set. So, the Global Warming Response Act
21 has a requirement that we get and 80 percent
22 reduction in our greenhouse gas emission levels by
23 2050. By 2006 we were at 125. So, we have to
24 get to 25 million metric tons. The other is, the
25 goal the Governor has set in the Energy Master Plan

1 to get to a hundred percent clean energy by 2050.
2 So, your comments should, how do we need to build
3 this system for the next ten years, and how do we
4 set up that modern grid to get us to those goals by
5 2050.

6 And with that, we'll start calling
7 folks up. You can come up here, you can come up
8 here and speak at the dais, you can speak at the
9 microphone up there. You need to speak at one of
10 the microphones. We're recording this, so you want
11 to speak into the microphone so you get your
12 comments on the record, in the recording. Your
13 comments can be submitted in writing up through
14 Friday, October 12th, close of business -- close of
15 business five p.m. And, again, if you come up,
16 hopefully you can summarize your comments. Be
17 shorten than I am.

18 With that, we'll call the first
19 speaker.

20 MS. POWER: And, I just want to thank
21 Commission Dianne Solomon from the BPU who is
22 joining us this morning. Welcome.

23 MR. BOYD: All right. We'll get this
24 started. And, as Mike said, we're not going to get
25 the hook to take you off after ten minutes, but I

1 will give you a warning of three minutes when you
2 get there. Sometimes you loss track of the time,
3 so we'll likely warn you or tell you about that.

4 And the way I'll do it is I'll
5 announce three speakers, the first one coming up
6 and the other two will be on deck, as they say.

7 So, first I'd like to welcome up Joe
8 Accardo from PSE&G. Following that will be Imelda
9 Foley, and following her would be Henry Gajda.

10 MS. LOPEZ: Good morning. I'm not
11 Joe, but.

12 Good morning, everyone. My name is
13 Danielle Lopez. I am speaking on behalf of Joseph
14 Accardo for PSE&G today. I want to thank the BPU
15 staff for the opportunity to provide thoughts and
16 comments with respect to Governor Murphy's proposed
17 2019 Energy Master Plan, and today's Building a
18 Modern Grid stakeholder meeting.

19 PSE&G is a 115-year old company that
20 owns and operates 1,700 circuit miles of electric
21 transmission and 22,000 circuit miles of electric
22 distribution, in service of 2.2 million customers
23 in the State of New Jersey. In addition, PSE&G
24 owns and operates 58 miles of gas transmission, and
25 17,800 miles of the gas distribution mains, to

1 service 1.8 million customers.

2 Like our country's interstate highway
3 system, electric and gas transmission and
4 distribution infrastructure is essential to New
5 Jersey's economic well-being and quality of life.
6 It has helped power the industrial northeast for
7 more than a century. Unfortunately, a significant
8 portion of the New Jersey's transmission and
9 distribution systems date back to the early 1900s,
10 and needs to be replaced and upgraded to handle the
11 increasing demand for clean and reliable power.
12 In recent years, PSE&G has worked to replace,
13 upgrade, modernize, and sometimes move parts of the
14 grid to ensure our system can withstand extreme
15 weather, and other threats. Even as our customers
16 are using less gas and electricity, their reliance
17 upon clean and reliable energy has never been
18 greater. Our investments must be targeted and
19 prudent. We must push back against the myth that
20 investments in modern electric grids are not needed
21 in periods when the demand for power is flat.

22 Recent events in North and South
23 Carolina are all too painful reminders of
24 Superstorm Sandy, which devastated our region and
25 cost customers 775 million hours of lost

1 electricity. Since Superstorm Sandy, PSE&G has
2 made significant infrastructure improvements, and
3 has reduced unplanned transmission outages by over
4 sixty percent. Watching our fellow citizens
5 struggle with the affects of Hurricane Florence has
6 yielded an appreciation for New Jersey's robust
7 grid, and the need to continuously strengthen and
8 modernize it. The high-voltage grid must also be
9 storm-hardened and modernized for an environment
10 that can be hostile to our electrified society.

11 The customer benefits are clear as we
12 move forward into the 21st century, the electric
13 grid must be upgraded to adapt a more distributed
14 generation of energy storage. A shift in the
15 electric generation mix, a move away from central
16 generation, and a world that places a high premium
17 on system resilience. Edge of grid technologies,
18 like energy storage and electric vehicle
19 infrastructure, are important complimentary pieces
20 to that investment. The need for continued strong
21 investment in building a modern grid requires
22 investment in grid facilities as a first option
23 rather than a last resort when it comes to meeting
24 local and regional reliability needs. In virtually
25 all instances, a robust modern grid will retain its

1 importance and vitality as a compliment to, and a
2 facilitator of, technology and markets.

3 At PSE&G, our goal is to enable
4 renewable energy resources to inter-connect while
5 maintaining the reliability of the grid for all
6 customers. As such, we continue to develop
7 innovative tools to help the state achieve its
8 goals, from the Solar Loan Program to the Solar4All
9 Program, from creating a customer-friendly process
10 enabling residential customers to install rooftop
11 solar to providing generous solar limits for
12 distribution circuits and substations. PSE&G has
13 been a leader in the effort to accommodate
14 residential, commercial, and large solar farms.

15 With that said, it also must be
16 recognized that some areas in southern and central
17 New Jersey has experienced tremendous growth in the
18 adoption of renewable energy. Particularly solar,
19 that has tested the limits on individual electric
20 circuits. Part of building a modern grid will be
21 planning for and developing new tools to equip the
22 grid, and accommodate a large amount of renewables.
23 PSE&G's recent Energy Strong II filing represents
24 the next step in PSE&G's efforts to strengthen the
25 utility's gas and electric systems to withstand

1 storms, improve reliability, and significantly
2 enhance resiliency. Through hardening stations and
3 circuits, and increasing system automation, the
4 Energy II Program will improve reliability and
5 enhance resiliency. In addition, by building a
6 secure distributed communication network and new
7 operational tools, PSE&G is working to modernize
8 the system to not only increase resiliency, but
9 also implementing the fundamental tools to safely
10 and reliably integrate new clean and renewable
11 generation sources.

12 Building a modern grid gives us the
13 optionality to adapt to whatever the future holds.
14 And, a modern and resilient transmission and
15 distribution system, will be among the most
16 valuable assets we have. Distributed generation
17 resources, energy storage, and other new
18 technologies will not eliminate the need for a
19 modern electric grid. Rather, these resources and
20 technologies will depend more than ever on the grid
21 for their economic justification and deployment.
22 A modern grid will depend on continued investment,
23 both in the distribution system and transmission
24 system. A core element of the next generation grid
25 is a reliable and resilient transmission network.

1 Transmission is and continues to be the backbone of
2 our electric system. And, the ability of the
3 modern grid to respond to dynamic needs of the
4 customer is predicated on the efficient and
5 reliable flow of power through high-voltage
6 network.

7 PSE&G has actively upgraded and
8 reinforced its transmission system over the last
9 several years. Our investments have included large
10 and challenging extra high-voltage transmission
11 projects covering hundreds of miles in the mostly
12 densely populated areas in the nation. Energy
13 storage also offers some of the most promising
14 benefits for modernizing the electric grid. It
15 enables higher levels and better integration of
16 renewable energy onto the electric grid, and
17 provides resiliency for critical infrastructure,
18 and enables electric lines to handle greater
19 capacity during peak electric use.

20 As we know, the Governor has set a
21 target of 600 megawatts of energy storage in the
22 state by 2021. And, 2,000 megawatts of energy
23 storage by 2030. PSE&G is taking up this
24 challenge and investigating ways to more
25 efficiently and effectively integrate energy

1 storage into its infrastructure, to provide
2 resiliency and maintain reliability as the amount
3 of grid-connected solar increases. PSE&G's
4 Solar4All Program currently has three megawatts in
5 the pilot program that integrates solar with other
6 battery technologies to provide reliability and
7 resiliency for critical facilities during prolonged
8 outages.

9 PSE&G is also developing a new program
10 to increase the amount of energy storage capacity
11 on PSE&G's electric distribution grid. Continued
12 investment in our system is required if we are to
13 meet the challenges of an electrifying economy.
14 Installing modern digital technologies, deploying
15 and serving more distributed resources, enhancing
16 regional and inter-regional energy markets,
17 lowering electric prices for consumers, and
18 strengthening the grid against physical, cyber and
19 natural disruptions.

20 PSE&G is ready to meet those
21 challenges, and looks forward to working with the
22 BPU in that process. Thank you for the
23 opportunity.

24 MR. BOYD: Slight change of order.
25 We'd like to welcome up Henry Gajda. Followed by

1 Gabrielle Figueroa, and Doug O'Malley.

2 MR. GAJDA: Hi. My name is Henry
3 Gajda. I'm with the New Jersey League of
4 Conservation Voters. Thank you for the
5 opportunity to speak here today on this important
6 issue of Building a Modern Grid. I'll keep these
7 comments fairly brief. We submitted comments, and
8 will continue to do so.

9 So, as you all know, our grid has
10 evolved from a centralized system into one that is
11 more like a web. This evolution has been
12 influenced by the transition from centralized
13 energy resources like huge coal-fired power plants
14 to a distributed energy resources, like wind farms
15 and solar arrays. Running it smoothly requires new
16 and advanced lines, as well as increased
17 coordination among generators, transmission and
18 distribution system grid manager, and consumers.
19 And, the EMP should explore really every avenue,
20 including increased transparency and collaborative
21 measures to make sure that they have a functioning
22 grid.

23 Understanding grid dynamics is
24 essential to future electricity growth. And the
25 EMP should be forecasting and energy projecting to

1 ensure that we really know and have a really great
2 empirical basis for load shaping, and the variables
3 that will impact load shaping. From this
4 information, demand response programs and public
5 education initiatives should encourage non-peak
6 load time us. With the influence of electrical
7 vehicles growing in society, charging and other
8 power-intensive activities should be encouraged
9 during non-peak hours, like overnight, to reduce
10 grid stress and keep energy costs low by preventing
11 peakers from coming on line. And, to also provide
12 a basis for regional reliability and storage needs.

13 Infrastructure investment and
14 improvement is also essential to maintain a
15 reliable grid. It is important to continue
16 strengthening the system of wires, transformers,
17 and substations that move power around our state.
18 In addition, we should also explore every avenue to
19 ensure that we do so, while also taking in the
20 anticipated impacts of climate change, just to
21 increase the reliability of our electric grid; and,
22 also, maintain functioning during times of extreme
23 stress.

24 And then lastly. Any new fossil fuel
25 infrastructure investments, such as compressor

1 stations or new pipelines, should be discouraged to
2 ensure that we also do meet the Global Warming
3 Response Act goals. And, also, just really
4 facilitate and thrust New Jersey into a clean
5 energy future. Thank you.

6 MS. BLUHM: And, if you have remarks
7 that you can leave with the stenographer, she would
8 appreciate that.

9 MR. GAJDA: Sure. Sorry.

10 MS. POWER: I'd also like to welcome
11 BPU commissioners Bob Gordon and Upendra Chivukula.
12 Thank you for joining us.

13 And, yes, to echo Sara's comments.
14 I'm also a fast talker. But, if you could slow
15 down just a little bit it really does help our
16 stenographer, as well.

17 MR. BOYD: Now I'd like to welcome up
18 Gabrielle Figueroa. Followed by Doug O'Malley.
19 And after that, Evan Bixby from Pine Gate
20 Renewables.

21 MS. FIGUEROA: Good morning. My name
22 is Gabrielle Figueroa. I am with the law firm of
23 Bevan, Mosca & Giuditta, and I'm here today on
24 behalf of the Retail Energy Supply Association, or
25 RESA. It's a coalition of the retail suppliers

1 that offer a diversity of natural gas and electric
2 products to residential, commercial, and industrial
3 customers in New Jersey, and throughout the
4 country.

5 I'm going to just briefly address some
6 of the technology ideas from the stakeholder
7 notice. Particularly advance metering
8 infrastructure, or AMI. It does look like AMI is
9 presumed in these comments and in this process,
10 which RESA thinks is a very positive thing. New
11 Jersey right now is 48th in the country in terms of
12 AMI deployment. This is according to the Energy
13 Information Administration. This is based on 2016
14 data published in 2017. And, the two states that
15 are behind New Jersey are Rhode Island and New
16 York, both of which have recently adopted AMI
17 initiatives. So, we're in the dust right now.

18 There are amazing benefits to AMI, and
19 we would encourage the Board to maybe to be a
20 little bit more -- to be quicker than some of the
21 proposals for say six years. We believe that AMI
22 can be deployed in the state in three years.
23 There are amazing benefits to AMI deployment.
24 Customers who lose power -- and we've seen this in
25 Superstorm Sandy and in other recent situations --

1 those customers, while they should always contact
2 the utility to tell them that their power is out --
3 if they don't, the utility is going to get a notice
4 from that advanced metering infrastructure, and
5 they'll already know and they can better target
6 restoration efforts.

7 Adoption of AMI increases customer
8 privacy by eliminating the need for on-site meter
9 readers, and lowers utility's operational costs.
10 And the data can help the customers to better
11 target energy efficiency measures, and take
12 advantage of other energy efficiency offers in the
13 Office of Clean Energy program. For example, the
14 data can let the customer know that their
15 refrigerator is not running well, and the customer
16 can take advantage of some of the energy efficiency
17 rebates that the state offers. Get a better
18 refrigerator. Reduce their load and reduce the
19 state's load overall. We do believe that AMI
20 should be on an opt-out basis to ensure maximum
21 participation.

22 The last thing I will address is the
23 data from the meters. The data does not belong to
24 the utility, it does not belong to their supply.
25 It's the customer's data. If the customer uses a

1 supplier or is part of the government the energy
2 aggregation program, the supplier and the
3 aggregator should have access to that data to
4 better design programs or help customers manage
5 their power. And part of the customer's consent to
6 sign up with a supplier should include access to
7 that data. But, it is the opinion and the
8 position of the Retail Energy Supply Association
9 that that customer, that the data belongs to the
10 customer.

11 RESA will be filing more detailed
12 written comments on this and other topics. Thank
13 you.

14 MR. WINKA: Thank you.

15 MR. BOYD: Next we'd like to welcome
16 Doug O'Malley. Followed by Evan Bixby. And
17 followed by George Hay III. Doug?

18 Okay. So, we'll move on to Mr. Bixby.
19 Evan Bixby? All right. George Hay? Okay. Well,
20 I'm going to read the next three. So, we'll do
21 Clark Bruno. Mr. Bruno? Edward Hutchinson.

22 We'll go back to anybody. We'll
23 re-read the list at the end in case somebody --
24 Okay. Doug, would you like --

25 MR. O'MALLEY: How's that for timing?

1 MR. BOYD: Perfect.

2 MR. O'MALLEY: Good morning. My name
3 is Doug O'Malley. I'm the Director of Environment
4 New Jersey. We represent more than 20,000 citizen
5 members across the state. And, maybe this is the
6 first time where I wish the hearing was at the
7 State House versus here. But, glad to be here on
8 time. And, obviously, thank you to the entire
9 committee to continuing to hold these set of
10 hearings. Obviously, today the focus is on the
11 electric grid.

12 This morning Environment New Jersey
13 released a report of documenting the growth of
14 renewable energy and the growth of renewables
15 across the country, including here in New Jersey.
16 Looking at the growth from 2007 up to 2017. And,
17 as you might imagine, the growth of the solar
18 sector in New Jersey was off the charts. And
19 that's because of this historical work of the
20 Office of Clean Energy upon this program.

21 I wanted to emphasis much more on
22 something that this hearing, obviously, focuses on.
23 And, that's energy storage. New Jersey was ranked
24 as 20th for energy storage, with one megawatt into
25 2017. Clearly, the Board has been immersed in the

1 issue of energy storage, for multiple years at this
2 point. And there's even a pilot program to work to
3 develop energy storage projects around the state.
4 Obviously, those projects for the most part did not
5 come to fruition. We have, through the Clean
6 Energy Bill that was passed this may, mandated for
7 New Jersey to have 2000 megawatts energy storage by
8 2030, and to have 600 megawatts in the early 2020s.
9 So, obviously, this is going to be another thing
10 that's on the court's docket.

11 That being said. When we think of the
12 growth of renewables, both in the solar sector and
13 the, obviously, the progress we've seen with
14 solicitations on off-shore wind, New Jersey is
15 poised to become the national leader in off-shore
16 wind. And, we also have to think of this as the
17 Murphy administration works to make New Jersey to
18 be a clean renewable energy leader, that we also
19 have the leadership on energy storage. And,
20 obviously, the portions of the legislation that
21 will move forward in energy storage are really the
22 first step. And, I think looking at the other
23 areas that we rank New Jersey in from 2007 to 2017,
24 it's clear that the inertia and the lack of funding
25 and the lack of policy focus from the top during

1 the Christie administration, made New Jersey -- we
2 were not leaders, we were obviously laggards. Some
3 things, obviously, the administration was holding
4 us back and rolling us back from climate action --
5 RGGI being the best example, as well as off-shore
6 wind. Clearly, there's going to be a wholesale
7 change. And, I think energy storage is one of the
8 aspects that the Governor, when he was campaigning,
9 announced his climate vision on Earth Day 2017. He
10 had a broad agenda, but he was also very specific
11 on energy storage. Obviously, those goals are
12 reflected in the Clean Energy Bill, and will
13 clearly be part of the Board's action moving
14 forward.

15 I think it is imperative when we look
16 at energy storage, we also need to have the funding
17 that's dedicated to make these projects work. This
18 is, I think, another great example of where using
19 the Clean Energy Fund for its intended purpose, and
20 having a hundred percent of its funds dedicated
21 towards clean renewable energy projects can pay
22 dividends. Because these are, obviously, very
23 aggressive goals, and we need to ensure that the
24 funding is not being siphoned off for, you know,
25 obviously, important projects -- New Jersey

1 Transit, or perhaps less important, but not
2 relevant projects like the funding for the state's
3 electric bill.

4 Also, when we're thinking of
5 modernizing the grid, clearly we can't just focus
6 on storage. And some of the lowest hanging fruit
7 continues to be the lack of rollout to smart meters
8 in this state. And, we've had, obviously, some
9 progress through Rockland Electric. But, this is
10 another area where the rest of the country has
11 moved forward, and New Jersey hasn't. And when
12 we're thinking of creating demand response
13 programs, or we're thinking of creating resiliency
14 programs, right now it's still very much imperative
15 upon you when the lights go out to call your
16 utility. Utilities should not be dependent upon
17 that happening.

18 And, obviously, there are many
19 benefits of smart meters. They obviously have a
20 cost, without a doubt. And the ratepayer is right
21 to question what is the ultimate value of smart
22 meters? I think the ultimate value can be seen
23 from other states. And, ultimately looking at
24 modernizing our electric grid, we cannot continue
25 to rely on a essentially a 19th century technology.

1 We need to be following the lead of other states.

2 And, finally, I just wanted to talk
3 about something that was a huge focus, clearly, at
4 last Thursday's hearing. And, that's the growth of
5 electric vehicles. And, this is another area
6 where, you know, New Jersey is not alone in this.
7 There are many members of the zero-emission vehicle
8 compact that don't have enough electric vehicle
9 chargers on the road and enough electric vehicles
10 on the road. But as we plan to hit the clean car
11 mandate, we also need to figure out what the impact
12 of having more electric cars, not only on the road,
13 but in homes and charging. And, effectively,
14 electric cars are batteries on wheels. And, so,
15 how can we plan for electric cars? How can we use
16 demand response pricing, and time of use pricing?
17 And, how can we ensure that we're not only planning
18 for electric cars, but we're depending upon the
19 growth in the electric vehicle sector to help with
20 battery storage and grid resiliency? That's kind
21 of, I think, the untold story of the electric
22 vehicle sector. And, there also is, obviously, we
23 have to plan for the electric to be able to handle
24 more of these on the grid.

25 So, I'll conclude my comments with

1 that. And, obviously, we'll be submitting more
2 detailed comments by the deadline. Thank you very
3 much.

4 MR. BOYD: Thank you. Next, Ryan
5 Storke. No? Dr. Gearoid Foley. And following,
6 Rich Gannon. Pamela Frank. Bryan Rubio. Tony
7 Simmons. Ibrahima Kalle. Mark Bellin. Ian
8 Michael. Brian Vayda. Barbara Blumenthal. Jams
9 Thomas. Kevin Hernandez. Bernadette McPherson.

10 MR. WINKA: Just to be clear. These
11 are folks that signed up and asked to speak at this
12 section, so it's not an old list. It is the list
13 that people check themselves saying "I do want to
14 speak at this section". So, probably some
15 confusion about where that check mark was on the
16 website.

17 MR. BOYD: We'll keep going until we
18 get the next one on deck, at least.

19 Walter Wilson. Julia Bovey. Nicole
20 Sitaraman. So, you'll be next Ms. Sitaraman.

21 MS. FOLEY: Let me set the record
22 straight. I'm not a doctor. But thank you anyway.
23 I appreciate it.

24 Appreciate the opportunity to address
25 the committee. I'm here from the Department of

1 Energy's combined heat and power technical
2 assistance partnership. DOE CHP TAP works with
3 end-users and policy makers to assist in
4 transforming the market for CHP waste heat to power
5 and district energy technologies throughout the
6 United States.

7 Combined heat and power technologies
8 hold enormous potential to improve the nation's
9 energy security and resiliency, and reduce
10 greenhouse gas emissions. CHP supports our move
11 to a clean energy economy and the creation of green
12 jobs. The Department of Energy has long championed
13 CHP technologies to harness the full power of CHP
14 to help the nation meet its energy goals.

15 CHP is part of a community-based
16 hybrid microgrid including renewables and battery
17 storage, represents a cost-effective means of
18 providing resilient base load power and thermal
19 energy for the local community, including critical
20 infrastructure in an accessible way for all.

21 The advancement of CHP is part of the
22 US Department of Energy's Office of Clean Energy
23 and Renewable Energy, DERE, as part of their
24 mission to create a sustainable American leadership
25 in the transition to a strong and prosperous

1 America powered by domestic, affordable, and secure
2 energy for the industrial, manufacturing, federal,
3 institutional, commercial, and multi-family
4 sectors.

5 Combined heat and power does address a
6 number of issues so relative to modernizing the
7 grid. And, in response to some of the questions
8 posed, 3, 4 and 5, which address "how does a modern
9 grid address, adopt, or respond to climate change?
10 Fuel diversity and renewable energy within the
11 modern grids, and integrated distribution
12 planning". A modern grid can benefit significantly
13 from the application of CHP, which provides local
14 dispatchable resilience. It is fossil fuel, but
15 it is a very clean form of fossil fuel energy as we
16 move towards a hundred percent renewable future
17 providing a short term here and now solution. It
18 can also be fueled with bio-fuels, so in the future
19 it can support the fully renewable grid. And, it's
20 very cost-effective. It is one of the main go-to
21 alternative for delivery of bulk power on the grid
22 in a clean and sustainable manner.

23 In relation to State Policy Question
24 Number 7. State policy supporting a modern grid to
25 increase resiliency and reliability, and fight

1 climate change. Again, here, inclusion of
2 combined heat and power as we move towards this
3 hundred percent renewable future, provides the
4 local resiliency to dispatchability of a natural
5 gas or bio-fueled fired generator provides the
6 keystone for local microgrids base load energy
7 delivery. It also provides spending reserve,
8 ancillary services, that we normally rely on the
9 grid; so fire support, frequency support, et
10 cetera, can be embodied in the CHP plan. It's a
11 powerful assist in a hybrid microgrid.

12 And, as we move towards the future --
13 and this is part of DOE's vision -- from the CHP,
14 we look at hybrids CHP plans, which are CHP
15 batteries and PV combined at a local area providing
16 resiliency to multiple facilities in a clean and
17 sustainable and reliable manner. The CHP
18 component, again, understanding it's a fossil fuel,
19 but it provides the cost-effectiveness component
20 right now that's driving some of these microgrids.
21 And, it is also compatible with the existing grid.
22 So, again, as we move forward and the discussion
23 moving from very large distant resources of energy
24 to distributed energy resources, we believe that,
25 again, in the short term as we move forwards toward

1 the goals here, that the combined heat and power
2 offers a lot of benefits towards helping develop
3 the modern grid. Thank you.

4 MR. BOYD: Thank you. Next, Ed
5 Potosnak. Joanne Pannone. Armando Tamargo.
6 Duncan Cambell. Susan Dorward. Brian Kauffman.
7 Brian, you'll be on deck. Thank you.

8 MS. SITARAMAN: Hi. Good morning. My
9 name is Nicole Sitaraman. And, I'm a Senior
10 Manager of public policy at Sunrun. And, I work on
11 the company's legislative and regulatory
12 initiatives in the mid-atlantic region. So,
13 certainly New Jersey, also Pennsylvania, Maryland,
14 Delaware, and the District of Columbia.

15 I'm really appreciative for another
16 opportunity to share our thoughts with you all.
17 We participated in the first session on Clean and
18 Renewable Energy. And, actually, this session I
19 believe is actually the most important session.
20 Because, really, we're at a place where we, all
21 stakeholders, have the ability to decide what we
22 want a modern grid to actually look like, and who
23 we want it to really service.

24 I also just want to acknowledge my
25 former colleague, Danielle. We both served in the

1 DC Office of the People's Council. So, we're
2 consumer advocates at heart. So, it's great to see
3 her here.

4 So, Sunrun is the largest residential
5 solar and storage company in the U.S. And, we
6 have about 200,000 customers in 23 states, D.C.,
7 and Puerto Rico. We've been spending a lot of
8 time, our team, in Puerto Rico working with
9 stakeholders on rebuilding the grid, in a more
10 customer centric fashion, after Hurricane Maria and
11 severe weather events.

12 We have a great interest in working
13 with stakeholders to map out the future of
14 distribution system planning, DER, Department
15 Energy Resources programs, and rate design, that
16 will facilitate greater customer adoption of solar
17 and storage. And, will make sure that those
18 resources benefit all ratepayers. So, while we
19 are very customer centric, we really need all
20 customers because we believe that these resources
21 will benefit all consumers on a grander scale.

22 So, when we're talking about a modern
23 grid, what we really focus on is how do we define
24 that. And, there are many approaches to
25 modernizing a grid. But, from our perspective, a

1 modern grid is not -- should not be focused on kind
2 of more expensive gold-plated, same old versions,
3 of what we currently are working with in terms of
4 our infrastructure, that we've been working with
5 for several decades -- in fact, a hundred years.
6 This is an opportunity to explore ways to really
7 re-design our electricity delivery system. And, we
8 believe that decentralization is a really key
9 component. And, also focus on customer-sited
10 resources like solar and battery storage. Which we
11 believe should be the anchors of any grid
12 modernization proceeding.

13 I also want to highlight another kind
14 of cornerstone principal that we would encourage
15 stakeholders in this process to think through.
16 But, we really want to make sure that grid
17 modernization moving forward encourages
18 competition, rather than inhibits competition. So,
19 we want to make sure that all market players have
20 an opportunity to serve customers and to partner
21 with the utilities, to ensure that our grid is
22 reliable and resilient. We acknowledge and indeed
23 respect greatly, the utilities have an enormous
24 responsibility to maintain grid reliability. And,
25 we believe this is a critical opportunity to

1 explore ways that utilities can partner with DER
2 providers to enable customers to help in the grid
3 resiliency effort.

4 One important approach to that would
5 be a focus on non-wires alternatives. So, there
6 are -- across the country there are -- utilities
7 are coming in with a great deal of requests for
8 return on investments and resources for build-out
9 of infrastructure that may not be necessary. And
10 that, of course, from our view, requires greater
11 emphasis on identifying locations in local grids,
12 statewide grids, that could benefit or really could
13 really provide at a lesser cost customer-sited
14 solutions to enable grid reliability. So,
15 non-wires alternatives we think can provide
16 benefits to distribution planning, including the
17 ability to defer and avoid unnecessary
18 ratepayer-funded utility capital expenditures, like
19 poles and wires. And, also, the benefit that from
20 a larger client perspective, would be a reduction
21 in peak demand.

22 The Solar Energy Industry Association
23 recently published a white paper, which I would
24 refer you to, that talks about non-wires
25 alternatives. And, they say that non-wire

1 solutions will be a key part of holding down
2 utility system costs in the future, which will lead
3 to significant ratepayer savings. As utilities are
4 required to make the public more of their system
5 planning and expected investments in emphasis, DER
6 providers will be able to offer solutions to meet
7 utility needs that may otherwise be met through
8 additional distribution grid infrastructure
9 investments at a fraction of the cost. This will
10 ultimately result in savings for ratepayers as
11 utilities are able to contract with DER provider
12 for more cost-effective solutions, and policy
13 makers can develop tariffs that support DER to
14 offset or relieve grid needs.

15 And, that leads to my final point.
16 And, some of my team members in other
17 jurisdictions -- specifically New England and New
18 York -- are exploring a concept or a new tariff
19 arrangement called "bring your own device". And,
20 we would encourage in this proceeding or moving
21 forward that that kind of structure be explored
22 here. So, basically, it's a tariff that enables
23 customers to purchase battery storage from whoever
24 they want, and allow the utilities to have access
25 to that resource at their property so that they can

1 pull from basically that battery during times of
2 high peak demand. So that it benefits ratepayers
3 on kind of an aggregated basis, reduces cost
4 overall, and the customers get a benefit on their
5 bill. And it doesn't kind of interfere with net
6 metering at all, it's separate from that. So,
7 it's something that we're going to provide greater
8 comments on by October 12th. We're going to really
9 explore that. And, also, talk about more about
10 Puerto Rico. But, we think it's a really
11 innovative great idea that New Jersey could benefit
12 from.

13 So, thank you very much. And, I look
14 forward to continue to participate in this process.

15 MR. WINKA: I just want to take one
16 moment to agree with you a hundred percent that
17 this session is the most important. And, also, as
18 you raised the issue on competition. The next
19 session on Friday, behind run by Cynthia Hollands,
20 is where we'll get into that energy competition.
21 As the Board, we're very much in agreement about
22 energy competition. So, thanks.

23 MR. BOYD: All right. Mr. Kauffman.
24 Followed by Matthew Davey. No? Okay.

25 Scott Yappen. Alexa Henao. Jaci

1 Trzaska. Sally Gellert. Bruce Burcat. James
2 McDermott. Dean Evans. Vince Faherty.

3 Okay. Gaylord Olson, you'll be on
4 deck, sir.

5 MR. KAUFFMAN: Great to be here. My
6 name is Bryan Kauffman. I'm with the Enel Group.
7 And, thank you to Michael Winke and the EMP team,
8 as well as Commissioner Chivukula, Gordon, and
9 Solomon, for being here and hosting.

10 Who is the Enel Group? I just want to
11 say a few words about that. So, you might be more
12 familiar with a brand called EnerNOC, that offers
13 demand response. So, we were acquired last year.
14 And, as of next week we will no longer be known as
15 EnerNOC. We'll be Enel X. The Enel Group is a
16 global energy company headquartered in Rome, and
17 has 72 million customers. We are the wires company
18 in many countries. And, actually, we operate in
19 thirty countries here in the U.S. We have this
20 company EnerNOC providing demand response, demand
21 energy, which does a lot of customer-sited solar
22 and storage. And, a company based out of
23 California called E-Motorworks that works on
24 integration of electric vehicles into the grid.
25 We also have a company called Enel Green Power

1 North America. Which operates over 5,000
2 megawatts of hydro, solar, wind, and other
3 renewable power here in North America.

4 So, first off, thank you very much for
5 hosting this. Isn't this a humbling event?
6 Thinking about 2030, 2050. I would say a wedding,
7 like I hope we're all here for your 50th
8 anniversary and, you know, I feel a little bit like
9 that. But, it's great to be here and talking
10 about these issues.

11 My comments will kind of focus on some
12 of the same issues that the prior folks have talked
13 about. Danielle, Nicole, and Doug, I think hit on
14 a lot of points that we think is really essential
15 for developing a modern grid. And, let me just
16 start off with those, and think about the path
17 forward.

18 So, the first element we'd like to
19 talk about is a clean peak standard. And, we
20 definitely would recommend considering that in
21 addition to the states renewable portfolio
22 standard. A clean peak standard, such as the one
23 that was recently passed up in Massachusetts, helps
24 to ensure that as renewable penetration grows, that
25 an associated amount of storage and curtailment

1 activity can also be encouraged to come on line.
2 And, that's really essential to seeing that peak
3 time of the day when the grid is stressed the most,
4 that renewable energy is supplying that, and really
5 helps flatten the grid. And, it's really so
6 important that -- you know, in a lot of states
7 they're considering this because they don't think
8 it's possible to meet a goal such as a hundred
9 percent clean energy without something like this.

10 The second major topic is financial
11 incentives for storage. As others talked about,
12 New Jersey just has passed a goal by January 1st,
13 2021 -- so just about two years from now -- 600
14 megawatts. And as you heard from some other folks,
15 a year ago we only had one or two megawatts on line
16 here. Obviously, that's a huge gap. And I would
17 encourage the EMP team to really think about that
18 as a high priority to get those incentives,
19 whatever is really needed to meet that goal. And
20 I'll talk about interconnection is also a key
21 issue.

22 The third big topic -- and some other
23 folks also talked about this -- is non-wires
24 solutions. So, nearby states like New York and
25 District of Columbia have experience with this

1 process. And, a key goal for a non-wire solution
2 program is to really consider all alternatives to
3 distribution upgrades, and conduct third-party
4 analysis to assess if a more affordable alternative
5 can exist in a form of a non-wire solution such as
6 DER, including demand response, energy efficiency,
7 energy storage, and solar.

8 The next big topic I'd like to talk
9 about is demand response. And, in AB3723 that was
10 passed in May, the state put forward goals around
11 peak shaving, which is a form of demand response.
12 And, I think what a lot of states have seen is good
13 modernization relies on customers, customer
14 engagement. And, demand response is really the
15 gateway drug to a lot of differently types of
16 customer engagement. And, we would definitely
17 recommend prioritizing that. And, I think even
18 AB3723 calls on the BPU to really set a lot of
19 goals by mid-2019. So, I encourage you to focus
20 on that issue.

21 The next big topic is maximizing DERs
22 to support resiliency. And, I think others have
23 really gone into a lot of details there about how
24 useful on-site fuel in the form of clean renewable
25 fuel, such as solar backed up with storage can be.

1 And, you know, if we think about Hurricane Sandy,
2 just imagine if more customers had back-up power on
3 site that was storm proof, and was also clean.

4 The next big topic, which I think
5 really is important for all of this to happen, is
6 rate structures. And, we're partners with
7 utilities in many states, and we see them as those
8 who can really get these programs off the ground.
9 Especially DER and other customer-sited solutions.
10 So, we really see that utilities, though, need to
11 be incentivized to help develop the a grid that
12 allows those resources to come on line. And, if
13 that didn't take in -- you know, focused on, then
14 often, even if you pour a lot of resources into a
15 lot of different solutions, the utility is really
16 there to be supportive, or they're the one who
17 understands that there's risk to the grid and
18 really slow down a lot of processes. So, we see
19 that utility incentivization is really key.

20 And, also -- echoing Sunrun --
21 competition. Companies like ours really only
22 operate in states where there's competition. And,
23 we see that competition is essential to bring
24 solutions to customers. But, it's also important
25 for customers to have access to solutions that are

1 the most affordable. And, obviously, thinking ten
2 years, thirty years down the line, New Jersey is
3 thinking a lot more than just energy. You're
4 thinking about how you retain companies here in the
5 state. And, that's really also gets at what are
6 the cost of doing business. And one of the big
7 cost to all business is energy. So, having
8 competition really is a key part of that.

9 And, I'm getting to the end here.
10 But, the next part, you know, to focus on an
11 interconnection. Because that is something that
12 in so many states is an impediment to any type of
13 modern grid. And, we see some states that have
14 really taken a lead, like California, driving down
15 the times to inter-connect behind meter solar down
16 to a week. And that, obviously, can be done. And
17 a lot of states have made progress, like New Jersey
18 on that with solar. I think there's probably more
19 that can be done on solar, as well as, as we think
20 about storage and other EVs that are interconnected
21 that are going to be functioning both with load and
22 generation at different times of day. There
23 really should be a lot of focus on interconnection.
24 And, like we talked about, setting ambitious goals
25 and having some elements competing with those.

1 Interconnection is one of those areas where unless
2 that's taken really as a focus area, it can be very
3 difficult to reaching these important goals for the
4 state.

5 And, I'll just say finally, EV
6 charging infrastructure. We are a proponent of
7 modernizing the grid so EVs can easily come on line
8 and provide different levels of service, both to
9 the utility and also to wholesale grid operators
10 like PJM. And, that also relies on coordination.
11 And I think a lot can really be done at the state
12 level, because at the end of the day these are
13 mostly state interconnections, and state has the
14 authority.

15 So, thank you very much for giving me
16 this opportunity. And, October 12th we will
17 definitely be submitting more comments.
18 Appreciate any feedback.

19 MR. WINKA: Great. And, just on the
20 interconnection issue. We've been a winner of
21 freeing the grid a number of times. And
22 Mr. Hunter, who's sitting in the back there, runs
23 probably the best interconnection work group in the
24 country dealing with all those thorny issues that
25 get in between those gray issues on regulation to

1 interconnection. And, I would suggest you
2 participate in the interconnection work group.

3 MR. BOYD: Mr. Olson. Followed by
4 John Reichman.

5 MR. OLSON: Hello. My name is
6 Gaylord Olson. Originally I was intending to be
7 just a listener at this event. But, I realized I
8 did have a few things about discussion points 4 and
9 6. Four being, "How does the state plan for fuel
10 diversity and renewable energy within a modern
11 grid?" And, 6 is, "In what ways can a modern grid
12 meet the Global Warming Response Act 2050
13 greenhouse gas emissions reduction requirements and
14 the governor's goal of achieving one hundred
15 percent clean energy by 2050".

16 So, I'm assuming one hundred percent
17 clean energy means avoiding all fossil fuel. So,
18 we've heard a bit about energy storage. And, that
19 is a big issue to get to one hundred percent clean
20 energy.

21 Now, I'd like to bring to your
22 attention that energy is not measured in megawatts.
23 Energy is measured in megawatt hours. Power is
24 measured in megawatts. And, so, we need to keep
25 that in mind. Now, this is a mistake that is very

1 frequently made. People start talking about energy
2 and energy storage, and they say so many megawatts.
3 That's like apples and oranges, sort of, that is.
4 You need to know how many megawatt hours it might
5 be. Now, on that thing, if you look at Wikipedia,
6 you'll find that the largest form of energy storage
7 for the grids worldwide happens to be pumped
8 hydro-electricity. And, I'll just give you the
9 quote. "Pump storage is the largest capacity form
10 of grid energy storage available. And, as of
11 2017, the U.S. Department of Energy, global energy
12 storage database reports that pump storage hydro
13 accounts for over 95 percent of all active storage
14 installation worldwide". Over 95 percent. And,
15 so, batteries have to fit into the little bits
16 between 95 and a hundred. A few percent for
17 batteries. I will submit to you that it's
18 probably going to remain that way for a long time
19 into the future. We're going to have to rely on
20 pumped hydro-electricity for almost all of our grid
21 scale storage.

22 Now, along that same line. Most
23 people assume that there's been very active study
24 of this, and so we're running out of places where
25 we can do pumped hydro. And, believe that's really

1 not true. And, I mentioned this at a previous
2 meeting, but I'll just bring it up again here.
3 There are three places, happen to be in Germany,
4 where there are pumped hydro installations without
5 a dam. Most people assume you have to have a dam,
6 and you have to have two reservoirs -- a low-level
7 reservoir and a high-level reservoir. So, you
8 pump water under the lowest level to the high one,
9 that stores the energy. You let the water come
10 back down to the lower reservoir, and the energy
11 comes back. So, you might say that's a sufficient
12 condition to have it function. But, it's not a
13 necessary condition. You do not need to have a
14 so-called reservoir at the bottom. You only need
15 a source of water at the bottom. That source of
16 water could be an active flowing river, such as the
17 Delaware River, such as the Hudson River.

18 So, the fact is you do not need to
19 build a dam to disturb the environment in terms of
20 fish or anything else. You can have the continuous
21 flowing river there at the bottom, and you pump
22 water up to a reservoir at the top of the hill.
23 Now, there if you don't have a lake -- and believe
24 it or not, there are some places where you actually
25 already have a lake. Along the Appalachia trail in

1 northwestern New Jersey there's a place called
2 Sunfish Pond. And Sunfish Pond is a thousand feet
3 up from the Delaware River. So, if anybody wanted
4 to, they could convert that into a very large
5 energy storage facility. Now, the environment
6 people probably would not want that. But, of
7 course, you can excavate artificial reservoirs
8 elsewhere other than changing anything about the
9 existing natural pond.

10 So, what I'm saying is, if you can
11 look into the far enough -- into the future far
12 enough, I think we can envision that we can have
13 multiple pump storage hydro facilities along the
14 Delaware and Hudson River. This might require
15 some additional transmission lines to come from
16 those sites down to the cities, like Philadelphia
17 and New York. But, I'd like to at least put this
18 out there as a possibility.

19 And, I did submit something in writing
20 on this same subject. If you want to look it up
21 right now, there is quite a bit on the internet.
22 If you go to the New Jersey Sierra Club latest
23 newsletter and look on Page 13, there's a more
24 extensive description of that than what I'm giving
25 you here today.

1 One additional little fact, which I
2 did a calculation of a few weeks ago. If you look
3 at the energy that's stored in the largest pumped
4 hydro facility in the United States -- which
5 happens to be in Virginia, it's call Bath County
6 pumped hydro -- you look at the quantity of energy
7 stored in the water at the high level at that
8 location, and you compare it to the energy and all
9 of the batteries in all of the Nissan LEAFs --
10 -now, the Nissan LEAF is the biggest selling
11 plugged-in car in the world today -- if you compare
12 the energy stored in that one pumped hydro facility
13 with all of the energy and all of the batteries in
14 all of the Nissan LEAF in the world today, it's
15 about four times more energy in that one pumped
16 hydro location.

17 So, I would say we don't need to rely
18 on batteries for grid scale energy storage. And,
19 I'd be happy to discuss this with anybody else who
20 may be interested.

21 MR. BOYD: Thank you, sir. Next we
22 have John Reichman. Followed by Matt Davey.
23 Matt, you here?

24 Okay. Ashley-Lynn Chrzaszcz. Would
25 you like to speak?

1 MS. CHRZASZCZ: Yes.

2 MR. BOYD: Okay. You'll be next.

3 Thank you.

4 MR. REICHMAN: Good morning, everyone.

5 Thank you for hosting this important event. My
6 name is John Reichman. I'm the Chairman of the
7 Environmental Committee of Bluewave New Jersey.
8 Bluewave is a grassroots organization that's been
9 involved in many federal and state issues since
10 2005, including environmental issues.

11 When you're deciding on this Master
12 Plan, I think you need to keep three principles in
13 mind. The first is your decisions must take into
14 account the most important stakeholders in this
15 process. And none of them are in this room.
16 They are our children and our grandchildren. So, I
17 don't see too many minors out there. But, what you
18 decide may not have that much of an impact on an
19 old geezer like me. But, it's going to have
20 enormous impact on my children, and my
21 grandchildren.

22 Second principle I think to keep in
23 mind is that climate change is an obvious
24 existential threat. And, how we combat climate
25 change is the biggest economic and moral issue of

1 our time.

2 And, the third principle that I'd like
3 you to keep in mind, which sort of leads
4 ineluctably from the first two principles, is that
5 there needs to be a complete ban on new fossil fuel
6 infrastructure. That includes a new gas plant in
7 the Meadowlands. That includes all of the various
8 pipelines that are being proposed all over the
9 state. Now, I think it's debatable whether any of
10 these projects make economic sense. Particularly
11 if is you're really -- if you have a real goal of
12 one hundred percent renewable energy by 2015.
13 Because that would mean that all of this
14 infrastructure would be abandoned well before the
15 end of its useful life. But, let assume just for
16 the sake of argument, that there is a short-term
17 benefit to any of this new fossil fuel
18 infrastructure. What I ask is that you channel
19 Nancy Reagan and just say no. And, there is
20 certain analogy really between fossil fuels and
21 drugs. It's obviously not a perfect one. But
22 think about it. I mean, drugs give you that
23 short-term high. They give you a short-term
24 benefit. But they will kill you in the long term.
25 And, the same is true of fossil fuels.

1 So, now is the time to step up.
2 There are cities such as Portland that has done
3 this. There are countries that have done this.
4 And, now it's time for us to be the first state to
5 just say no to fossil fuels. Thank you.

6 MR. BOYD: Ms. Chrzaszcz. Evan
7 Berger, you'll be next.

8 MS. CHRZASZCZ: My name is Ashley-Lynn
9 Chrzaszcz. And, I'm an associate at Gabel
10 Associates. And, I am here today to testify on
11 behalf of the independent energy producers of New
12 Jersey, referred to as IEPNJ. And, we appreciate
13 the opportunity to present our views.

14 So, IEPNJ is a not-for-profit trade
15 association that represents New Jersey's generators
16 of electric power. IEPNJ members own or operate
17 approximately seventy percent of the electricity
18 generation capacity in the state. Members include
19 companies that sell electricity into the wholesale
20 market for sale with the state's utilities, which
21 in turn sell that power to New Jersey homes and
22 businesses.

23 As such, members of IEPNJ are active
24 participants of the region's wholesale power
25 market, and have a continuing interest in assuring

1 that there are adequate supplies of electricity to
2 fuel the region's growth in and environmentally and
3 economically sound manner.

4 IEPNJ's members have been on the
5 forefront of the dramatic changes that continue to
6 transform the power business. And since 1992,
7 IEPNJ is directly involved in shaping of the laws
8 and policies that affect New Jersey's power
9 industry, and has been an active contributor in the
10 state's Energy Master Plan process over the years.

11 We support New Jersey's direction to
12 creating a clear, more environmentally advanced
13 energy industry throughout the consumption,
14 transportation, and production chain. The power
15 generation industry is a vital component of this
16 chain, and generators are committed to continuous
17 improvements in the efficiency, reliability, and
18 environmental performance of its plans. In this
19 regard, the one factor we wish to emphasis is that
20 the most efficient way for New Jersey to achieve
21 its goals is to rely on competitive markets and let
22 them work. Competition forces market participants
23 to respond to competitive pressure by improving
24 efficiency, which in turn reduces costs and
25 improves environmental quality.

1 New Jersey's generation fleet has
2 evolved and improved significantly over the years
3 for this process. New Jersey's power generators
4 are currently one ever the cleanest fleets in the
5 United States. And, we recommend that you
6 continue to work in fostering the competitive
7 energy marketplace. The Energy Master Plan should
8 clearly indicate that it will continue to rely on a
9 competitive market design to achieve these goals
10 for New Jersey.

11 IEPNJ looks forward to continuing the
12 work with New Jersey to provide the policies that
13 encourage the development of generation resources
14 needed to meet New Jersey's demand for power. In
15 addition, we are always available to serve as a
16 resource of information as you think through
17 important issues.

18 Thank you for the opportunity to
19 submit these comments.

20 MR. WINKA: Thank you

21 MR. BOYD: Thank you. Mr. Berger.
22 Followed by -- is Willett Kempton here. Thank
23 you, you'll been next.

24 MR. BERGER: Pleasure to be here this
25 morning -- I believe still -- with this great

1 panel. So, my name is Evan Berger. I work with
2 CALMAC. CALMAC is based here in Fair Lawn, New
3 Jersey. We were founded in 1947 in Englewood.
4 And, we've been manufacturing thermal energy
5 storage pod, so ice storage, for over forty years
6 since 1978. Last year we were acquired by a large
7 company called Ingersoll Rand. So, now I work for
8 the train company which is one of the firms that
9 comprises Ingersoll Rand. They also have a large
10 facility here in Trenton, so they have 190 kw
11 solar. I was told to say this. But, it's
12 actually my first year at the new company. It
13 hasn't been that bad. It's a large conglomerate.
14 It's a very big, well-run organization and hard a
15 driving culture that I appreciate.

16 So, we still manufacture here in Fair
17 Lawn, New Jersey. And, we've manufactured over a
18 gigawatt of thermal energy storage that's been
19 installed in sixty countries worldwide. We've got
20 projects such as -- we just put in a second project
21 at Rockefeller Center. Installation project at
22 LaGuardia airport right now. Have done a lot of
23 work in New York City. Here in New Jersey we've
24 done a large thermal energy storage project at
25 Rutgers. A number of projects in Perth Amboy.

1 School districts. And around the state. So, it's
2 a real pleasure to be here.

3 What I wanted to talk about just
4 briefly, which the laudable thing that you folks
5 are doing with the Energy Master Plan, and how that
6 sort of ties in with the new energy storage
7 mandates or the new energy storage legislation,
8 that has a very commendable and very aggressive
9 goal. So, the first and foremost things that we
10 do in the thermal energy storage and the energy
11 storage business is integrate the clean renewable
12 resources, particularly those intermittent
13 resources like wind and solar. Without storage you
14 can't have a real opportunity to make that grid
15 scale component to drive even fifty percent, let
16 alone a hundred percent of your power. And, so,
17 that's the number one thing that we do.

18 Our thermal storage, or ice storage,
19 essentially it's energy that is stored in the form
20 of ice. So, we manufacture large tanks here in
21 Fair Lawn. It's a modular system. And the idea is
22 that you run on a large air conditioner called a
23 chiller that makes ice at night. During the day
24 you're basically letting that ice melt to create
25 coolant that you then distribute throughout the

1 buildings. So, the idea it's kind of energy
2 arbitrage, making ice at nights and then melting it
3 during the day when prices are a whole lot more
4 expensive because of the realtime price market, as
5 well as reduction of demand charges. And, the
6 benefits that we have over battery storage is that
7 -- battery storage has got some real benefits, as
8 well, as the ability to provide not just for
9 cooling but for everything else -- but, on the plus
10 side for us we are about a third of the cost, and
11 we last two to four times as long for a very long
12 duration, a battery that has an eight-hour
13 discharge. So, one of the ways you would sort of
14 think of us -- and this is something that we do in
15 a virtual capacity all over the country,
16 specifically in Texas right now is where we're
17 essentially sopping up the wind, wind power peaks
18 at night. And, so, the energy prices in Texas,
19 which is a regulated competitive energy market just
20 like New Jersey, with a lot of wind in the western
21 part of the state, drives the prices to near zero
22 at night. Enabling our customer to basically buy
23 almost free electricity at night for use later
24 during that day, helping to integrate that
25 resource, drive up the price from below zero to

1 slightly above it on a must-run resource. And,
2 enabling that to come into the grid.

3 So, when you're looking at energy
4 storage, I think thermal energy storage has to be a
5 large part of that solution. Right now we've been
6 able to, you know, of significant success here in
7 New Jersey without any incentives or rebates
8 whatsoever. In other states, such as New York City
9 or New York where there's a large demand management
10 program an up-front incentive from utility, and
11 previously from the state -- and places like
12 California or Florida. FPL has a large -- Florida
13 Power and Light -- has a large thermal energy
14 storage program. It's relatively modest in scale
15 compared to some of the stuff that batter companies
16 and fuel cell firms have received, but it's enough
17 to drive over twenty megawatts and over nearly 200
18 megawatt hours of storage into that grid over the
19 last ten years or so.

20 So, we would recommend that those
21 sorts of incentives, modest as they may be, can
22 really drive a market. And, can really accelerate
23 the adoption of a really crucial thermal storage
24 and other energy storage technologies of all sorts
25 across this state. So, when it comes to how you

1 would incentivize a storage, what I would really
2 recommend to you folks is just a few things. The
3 first I would say provide as clear a market signal
4 as possible. As I mentioned, schools, hospitals,
5 the institutional sector -- outside of New York
6 where it's the large office building, the Goldman
7 Sachs, the Credit Suisse's and all these big
8 skyscrapers. Outside of those handful of large
9 metropolitan areas, it's schools and hospitals and
10 institutional clients that drive our business.
11 And, they'd be the first one to tell you that
12 they're not a very sophisticated audience from an
13 energy perspective. That's not the business that
14 they're in. They're in the business of serving
15 their clientele, their students and those who come
16 seeking help.

17 So, what we found is that a clear
18 incentive that they can calculate themselves and
19 understand at a very gut level is very important in
20 terms of driving the adoption of this stuff. Not
21 just for the most sophisticated, but for all
22 customers, your everyday folks. It's so important
23 to have these be transparent and either
24 prescriptive or known in advance. And, it's very
25 important that the incentives, any kind of

1 incentive that you're using, could drive market
2 adoption be regularly available.

3 We are a big fan of the non-wires
4 alternatives, non-wire solutions that have been
5 discussed earlier. We've done certain projects
6 with them in the past. What I would caution is
7 that -- and, they're very -- let me just say that
8 they're very useful if you got an acute need. If
9 you have a distribution substation or some other
10 feeder line that has a real problem, nuclear plant
11 comes or dramatic growth, it can be a very
12 successful way to really hone in on that. And,
13 great reductions there. The problem is, with those
14 sorts of approaches, is that it really kind of
15 drives your everyday customers out of the market.
16 If you are a school district that is constrained by
17 your buying capacity; or, when you're going to be
18 developing a school if, if it's not a regularly
19 available incentive it's very hard for you to take
20 advantage of that. Same is true for hospitals.
21 Same is true for most non-class A office customers.
22 So, it kind of creates a bit of a -- you know, some
23 distortion in the market. So, I would definitely
24 take that good thought in terms of how to create an
25 incentive structure for all the technologies that

1 you're looking to accelerate, that enables all
2 customer types to play a big role.

3 So, that's pretty much it for me. I
4 really appreciate the chance to speak with this
5 panel. And, we will be delivering to you some more
6 detailed comments before the 12th. Thank you very
7 much.

8 MR. WINKA: Thank you.

9 MR. BOYD: Mr. Kempton. Followed by
10 Noel Christmas.

11 MR. KEMPTON: Good morning. My name
12 is Willett Kempton. I'm a professor at the
13 University of Delaware. I heard the instruction
14 that we should minimize things that will repeat in
15 previous sessions. So, I'll just summarize.
16 There's a written version which I'll be
17 circulating.

18 So, in Executive Order 28 and
19 subsequent legislation, Governor Murphy and the New
20 Jersey legislature have tasked the Board of Public
21 Utilities with recommending how to meet the state'
22 energy storage goal of 600 megawatts by 2021, and
23 2000 megawatts by 2030. We explain here how
24 electric vehicles can help reach this goal at a
25 lower cost than relying solely on stationary

1 storage, whether battery for pump storage, or in
2 other mechanisms.

3 So, just very briefly. Our group, The
4 University of Delaware EV Research and Development
5 Group has developed -- well, invented and then
6 developed the use of vehicles to support the grid
7 so that it's being controlled. In other words,
8 grid integrated vehicles you can charge at slower
9 or faster rates, or maybe discharge, also. As well
10 as vehicle-to-grid that is putting power from the
11 vehicle onto the grid. So, that's something we've
12 been working on for twenty years -- surprisingly
13 enough. And, it's now being licensed to corporate
14 entities and being used to generate revenue.

15 So, for example. For commercial
16 projects right now, in Denmark earning \$1,500.00
17 per EV per year. Similar projects in the
18 Netherlands and France. A UD project 2013 to 2016
19 used BMW vehicles, and earned \$1,200.00 per year
20 per vehicle. In a new UD Nuve project -- Nuve is a
21 company that we licensed here in technology, too.
22 The new UD Nuve project has a total capacity of one
23 megawatt, which we're currently working on an
24 interconnection process with PJM. And, that's in
25 Delaware, so we can't interconnect in self because

1 legislation has been passed to facilitate this. At
2 the end I'll suggest some things that New Jersey
3 will need to do to be able to have these kinds of
4 capabilities.

5 So, how much does a V2G cost in
6 comparison to stationary batteries. So, let's
7 assume the strongest and most expensive case the
8 car discharge as well as charge, it has control
9 systems. So, you compare a stationary battery
10 systems, at the end of 2017 the cost was about
11 \$850.00 per kilowatt for utility scale, and
12 \$1,500.00 per kilowatt for a residential scale.
13 Cost of dropping, but it's likely that they will
14 not be economically viable without subsidy for some
15 time. By comparison, EV Group estimates that
16 adding bidirectional capabilities to an EV charger
17 will add in the range of 200 to \$500.00 per
18 vehicle. And an additional \$200.00 of equipment
19 for doing the controls -- talking to PJM or whoever
20 the grid entity is. So, if you take a 6.6
21 kilowatt Nissan LEAF, that's \$700.00 for one EV,
22 taking the high figures there considerably; or,
23 \$106.00 per kilowatt for bidirectional storage from
24 the EV. So a total \$815.00 a kilowatt for fixed
25 storage; \$106.00 per kilowatt for EVs doing the

1 same thing.

2 So, how much can you do with this? Is
3 this a small resource or is it large? New Jersey
4 has set a goal of 330,000 zero-emission vehicles.
5 So, we just take that as a bench mark without
6 making a statement about whether that is low or
7 high, or whatever. So, the state's goal of 600
8 and 2000 megawatts, how do those two compare. At
9 6.6 kilowatts per EV, 330,000 EVs would be 2,178
10 megawatts of storage. More than enough to meet
11 even the 2030 storage goal. So, this is a really
12 big storage resource. And, it's really low cost.
13 Although not all EVs will have V2G capabilities,
14 and those that do will not be connected all the
15 time, this example illustration, this example
16 calculation, illustrates that the EVs could be a
17 significant component to meet New Jersey's storage
18 goals. It's in the same order. It's not
19 one-tenth to 100 or something.

20 So, I'll skip down to policy
21 recommendations. You know, we've been working on
22 this in multiple states and in multiple countries.
23 So, we have a pretty good idea what's needed to be
24 able to do it. And, of course, the system was not
25 set up to do this kind of thing, so some rules

1 don't quite match. So, grid integrated vehicles
2 and vehicle-to-grid power face regulatory barriers
3 that prohibit market penetration. So, we list
4 policy actions here needed so that New Jersey can
5 capitalize on the benefits to support the state's
6 transition toward a clean energy economy. And,
7 that's both to encourage EVs, and also to encourage
8 a modern, cleaner grid by having low-cost storage
9 as part of that.

10 So, I won't go into each in detail. I
11 did go into more detail at the previous testimony.
12 And, there's a written handout. So allow for
13 interconnection of grid-integrated vehicle systems
14 using the industry that is the automotive industry
15 safety standard created by Society of Automotive
16 Engineers, that' SAE J3072. If you want safety
17 from an electric vehicle plugging into the grid,
18 let's look at what the automotive industry has
19 created for this purpose. This is a draft -- it's
20 a proposed bill in State of Delaware right now.
21 This is a new standard that just came out like two
22 years ago. So, that's Item 1, look at the
23 standard.

24 Second. Allow for retail credit for
25 export in utility tariffs. So, we've got credit

1 for solar, but we don't have credit for storage in
2 the low voltage end of the system. So, again, we
3 have some more detail on that. But, that's a very
4 important thing if you just -- every time you store
5 energy you push it back on the grid, you get zero
6 for that which -- you can't make money because
7 you're moving it back and forth, back and forth.
8 You have to get some kind of credit when you push
9 it back onto the grid. It doesn't have to be more
10 credit than what everybody else gets, it doesn't
11 have to be more than you bought it for. There has
12 to be some credit explicitly in there for export.

13 Third. Raise the fast-track
14 interconnection limit from 10 to 25 kilowatts as
15 recommended by the Interstate Renewable Energy
16 Counsel, IREC. So, that's already out there.
17 Some states are doing it. New Jersey has not done
18 that yet. That makes it possible to use the full
19 power of a car without artificially limiting it 10
20 to ten kilowatts because of the type of
21 interconnection limits that we have now.

22 And, fourth. Allow grid integrated
23 vehicles to compete on an even playing field with
24 transmission-connected storage in wholesale
25 markets. So, this is a response to FERC Order

1 841, which PJM will be evaluating. The state, the
2 BPU, could ask utilities to evaluate this Order,
3 and is it feasible. FERC allows for, possibly,
4 utilities that would want to do it, it's smart
5 accounting. So, if they do it, that's great. If
6 they don't do it, then we need to have the things I
7 mentioned earlier; the retail credit for exports.
8 You have to do one or the other, or you kill their
9 business. You take energy and you pay for it,
10 push it out, you get nothing. So, the idea is
11 you're moving back and forth, so you have to get
12 credit when you push it out.

13 The then fifth, and last
14 recommendation is kind of simple. And, that is,
15 explicitly include grid integrated vehicles in the
16 New Jersey definition of storage. Just to be
17 really clear, that's part of the whole picture.

18 Okay. In conclusion. V2G is a triple
19 opportunity. It provides storage, cleans up
20 transportation by providing a second remedy stream
21 to the vehicle owner, and lowers ratepayer costs.
22 Because, if you're providing services out into the
23 distribution grid you don't have to put in as much
24 infrastructure. So, it provides storage, cleans
25 up transportation, and lowers ratepayer cost. But

1 unless the policy actions described above are
2 implements, the BPU will effectively block this
3 valuable resource from use in the State of New
4 Jersey.

5 Thanks very much. Glad to take
6 questions later.

7 MR. BOYD: And, Mr. Christmas.
8 Followed by Jonathan Lu. Jonathan, you'll be next.

9 MR. CHRISTMAS: Good afternoon. Thank
10 you for letting me come before you today. I know
11 you look at that paper and thought that name was
12 false, but that is my name. Noel Christmas. I
13 can't hide from anybody with that name, so I have
14 to make sure I do things right.

15 Again, thank you for letting me come
16 before you today. As I said, my name I Noel
17 Christmas. I represent 3,500 members in the
18 utility industry. I am the president of the
19 Utility Workers Union of America, Local 601,
20 representing 1200 members for Public Service
21 Electric & Gas Company. And, I am the Chairman of
22 the State Council of the Utility Workers Union,
23 representing workers at New Jersey American Water,
24 United Water, Elizabethtown Gas Company, Bergen
25 County Sewerage Authority, Stamford Township Water

1 Authority, Berkeley Township Water Authority, Kelly
2 Construction, and J.D. Coley Construction. And I
3 also represent a small group that works for New
4 Jersey Transit.

5 Specifically for today's hearings I
6 will address the issues basically dealing with the
7 technology pieces of today's discussion on Building
8 a Modern Grid. As for the general principle, we
9 are for modernizing the grid and its infrastructure
10 and its resiliency. But, only to the extent of
11 upgrading its infrastructure to the point that we
12 are more resilient and prepared to handle the
13 ever-increasing presence of more powerful storms,
14 and making sure the public is safe. But, we have
15 500 jobs -- meter readers, field collectors, field
16 service operations, billing and payment centers,
17 customer service call centers and walk-in centers,
18 new constructions, gas and water contractors, and
19 gas and utility street workers.

20 I will not take up much of your time
21 with my testimony here today to talk to you about
22 the important role that we play in our state, in
23 our communities. Utility companies provide good
24 middle-class jobs to all communities, especially in
25 those communities where many are looking for an

1 opportunity to improve their lives to have a decent
2 living. What is being proposed will permanently
3 destroy the diversity of those jobs, along with
4 utility safety presence we provide in all
5 communities. Those opportunities will no longer
6 exist for me. And, I'm specifically talking smart
7 meters.

8 Now, as these utility companies,
9 corporations, and manufacturers will paint a rosey
10 picture of all the blind customer spin they will
11 put on about some of their false projections and
12 propaganda on grid modernization, specifically
13 smart meters -- a catchy phrase, but it does not
14 pass the smell test. Remember, it is almost
15 always, and I mean always, about money and profits
16 when it comes to smart meters. It's never about
17 the safety of the public.

18 Now, to briefly get into the details
19 backed up by some of the facts. The field jobs
20 that I represent perform important emergency
21 duties. Not just the duties that I described
22 earlier. We are the boots on the ground. We are
23 the ones that go into homes, see dangers, report
24 them, and have them corrected. I'm here to tell
25 you what corporations and utility companies, such

1 as PSE&G, and manufacturers won't tell you. We are
2 the ones who save lives before it even happens.
3 When meters are tampered with, we are the ones that
4 report it and have it corrected. We are the ones
5 who hear meters buzzing and have to shut down the
6 house until it's fixed, stopping many potential
7 fires that you never even hear about. We are the
8 ones that see landlords taking advantage of
9 tenants, jumping into electric meters. We are the
10 ones doing Superstorm Sandy and Hurricane Irene,
11 who answer the bell for police and firefighters and
12 many emergency personnel who did not have the means
13 or the staff to provide the protection to the
14 public needed from downed power lines, cracked
15 utility poles, wires being pulled down, and
16 potential major gas leaks that could have occurred.

17 Technology does have its place in our
18 society. Cell-phones, internet, social media,
19 access to information -- many other safe avenues.
20 But, not at the expense of lives of human-beings.
21 We are talking about gas and electric. Elements if
22 not checked, inspected, and corrected, people die.
23 I have a board here in front of you. We report
24 hundreds of these on a daily basis. I only printed
25 up a few. I have stacks in my office. Gas meters

1 taped, that our meter reader found. Shut down the
2 gas, called up, told the landlord he had to have
3 this corrected before the gas could be restored.
4 Electric meters tampered. Boxes broken into. All
5 these things, if we're not there, does not get
6 reported. Those are the things you don't hear
7 that happens every single day.

8 I have members that wanted to come
9 with me here today. I said no, you have to be in
10 the field, I'll take care of it, don't worry about
11 it, it's not that type of forum. I will speak for
12 us. All right. That's the kind of work that we do
13 out there that people do not understand. And, that
14 you will not hear anybody talk about smart meters
15 -- or gives a proposal on smart meters -- mention
16 that. The proponents of smart meters have not
17 written any proposal on how to provide safety to
18 the public. They don't tell you that batteries
19 overheat in smart meters and cause fires. They
20 don't tell you about all those hidden dangers that
21 I brought up. And as far as savings to the
22 customer, there has been no evidence of any
23 customer savings where smart meters have been
24 installed. In fact, it's been quite the opposite.
25 The analog meters that we have now have life

1 expectancies of about fifteen years. That's when
2 they get changed. When you start dealing with
3 smart meters and modernization and internet, now
4 all of a sudden they have to upgrade every couple
5 of years. And who's going to pay for that? The
6 customers, the public. That's who's going to pay
7 for it.

8 This year the State of Massachusetts
9 got it right. After a four-year investigation
10 their Department of Public Utilities came to the
11 conclusion that the business case revealed
12 weaknesses for advance metering functionality.
13 Regulators said that the evidence support a utility
14 investments in grid technologies like advanced
15 distribution management system, some sort of
16 automation, and volt optimization, as opposed to
17 automated metering infrastructure. Regulators
18 approve of other modernization investments in
19 addition to that, just nothing customer facing.
20 While the BPU did not take the decision lightly,
21 they declined and customer-facing investments at
22 this time. Kentucky regulators came to a similar
23 conclusion this year, also. And, North Carolina
24 is now questioning the same. Wherefore like I
25 mentioned earlier, we are for grid modernization

1 and upgrades. But anything customer-facing would
2 be a tragic, costly mistake. Not mater what those
3 who seek to profit from it tell you.

4 No one seems to be able to answer this
5 question. PSE&G has won the reliability award in
6 our region for sixteen years in a row. Beating out
7 states that have smart meters. And, we don't have
8 them. How is that possible? Everybody who told
9 you smart meters said they would have a more
10 reliable system, more modernization of a grade.
11 How come they're not winning those reliability
12 awards? How come their power outages are still
13 longer than ours? Nobody seems to answer that
14 question. One thing I can tell you. Also,
15 PSE&G's rates are equal or similar to those who
16 have smart meters -- or, even less. So, anybody
17 who's telling you about smart meters, all they want
18 is access to the data so they can make money on
19 that data, and also change the technology and
20 charge the customers whenever they see fit.

21 Thank you for your time. I appreciate
22 it. Have a nice day.

23 MR. BOYD: Thank you. Next, Jonathan
24 Lu. Followed by Jeanne Fox.

25 MR. LU: Hello everyone. It's

1 Jonathan Lu. It's hard to see. Yeah. Good
2 morning. My name is Jonathan Lu. I am the founder
3 and the leader of the Princeton Student Climate
4 Initiative, which is a group of student researchers
5 working with schools across the state to take
6 effective action on climate change.

7 First, thank you all for holding these
8 stakeholder meetings on the Energy Master Plan.
9 These set an inspiring example for me as a young
10 person on democratic decision-making. And, we also
11 applaud Governor Murphy on his recent efforts to
12 rejoin RGGI, and set strong clean energy goals.

13 Before I begin, I just want to note
14 that we hope to work together with every one of the
15 stakeholders in this room. You can find me
16 afterwards. We have a policy proposal today, but
17 we see it has complimentary to the other policies
18 that are being suggested. Especially because it
19 produces money, it generates funding. We don't
20 have the one solution, but we think we have a good
21 part of the plan.

22 For the past year, we have been
23 working with state assemblyman Andrew Swicker on a
24 proposal for a carbon pricing proposal that covers
25 all sorts of emissions in New Jersey. Which

1 compliments RGGI, which focused solely on the
2 electric sector. We have written a 94-page white
3 paper, and will be presenting our research at the
4 first international carbon pricing conference in
5 New Delhi. Our proposal will protect low-income
6 households and energy-intensive businesses, while
7 investing in crucial energy infrastructure and grid
8 modernization. We also recently held our
9 130-person state quarter forum on New Jersey
10 climate policy, convening representative from
11 across business, governments, utility,
12 environmental justice sectors. And, we look
13 forward to submitting our report on those
14 prospectives through this process, as well.

15 So, as a millennial I see climate
16 change as the biggest challenge facing my
17 generation. And I once despaired that we would
18 never muster the political will to take effective
19 action on climate change. Especially with the
20 partisan gridlock in Congress, pretty much
21 throughout the time that I've been growing up.
22 But, then I learned about carbon pricing as a
23 simple, effective, and politically feasible
24 approach. Simply put, carbon pricing makes it
25 more expensive to pollute, and gives an incentive

1 to switch to cleaner energy and to have energy
2 efficiency. And, it sets a clear, long-term market
3 price signal that everyone can calculate several
4 years into the future for all economic actors,
5 whether you're a business or a household. It's
6 technology neutral, and it can generate revenue for
7 investments, again, in things like a more reliable
8 and modern grid, and renewable energy. When I say
9 politically feasible, I mean that 73 percent of
10 adults in New Jersey support a carbon tax on fossil
11 fuels from a study of just this year. And, leaders
12 from both sides of the aisle -- our senator, Corey
13 Booker, two Republicans such as our former
14 governor, Christine Todd Whitman. Both
15 environmental groups and fossil fuel companies
16 support this.

17 We have been researching our carbon
18 pricing policy that works legally, economically,
19 and politically for New Jersey. What is most
20 exiting is the potential to generate funding. So,
21 if we set a \$30.00 CO2 price, which is about 27
22 cents on the gallon; and, we set aside 20 percent
23 for investments, this would generate about 700
24 million dollars a year for investments in things
25 like modernizing our grids, electric vehicle

1 charging infrastructure, renewable energy, and
2 public transit. Just to put this in context. The
3 total revenue -- the total yearly funding from RGGI
4 options, for all RGGI states in 2016, was only 400
5 million. So, if we set a strong carbon price, we
6 can really have the kind of scale of investments
7 that we need in order to get a head start, and be
8 first on this. At the same time you can delegate
9 the rest of the revenue to protect households from
10 the rise in energy costs.

11 One thing that I noted. Environmental
12 justice in low-income communities, these are
13 communities that are experiencing disproportionate
14 impact from climate change and the effects of air
15 pollution, who may not have the means to testify at
16 hearings like this today. We can take action to
17 protect them in particular. Dedicating a specific
18 amount to investments in their communities, and to
19 reduce pollution. This is a common idea. It's
20 an integral part of proposals in Washington State,
21 I1631, and the New York Climate and Community
22 Investment Act. For example, if you dedicated 30
23 percent -- I said 20 percent of -- I said about 700
24 million dollars. Dedicate 30 percent of that into
25 these communities, that gets you about 210 million

1 dollars each year for these investments.

2 Another question I don't think was
3 brought up was about natural gas leak detection and
4 mitigation. You can incentivize companies to stop
5 these leaks, again, with a price on greenhouse gas
6 emissions. We believe the government should
7 assume a worse leakage rate for pipelines until
8 companies can install effective reviews, leak
9 detection systems. The price will then give them
10 an incentive to monitor and reduce their leakage
11 from future emissions. And, that's all I have
12 today. Thank you all very kindly.

13 MR. BOYD: Thank you, Mr. Lu.
14 Following Ms. Fox we'll have Doug Davis. You'll be
15 next, sir.

16 MS. FOX: Thank you for having this,
17 and all the other hearings. I couldn't help -- I
18 didn't sign up to speak, but I saw there's three
19 commissioners here, so I want to say something.

20 So, I'm Jeanne Fox, and I'm
21 representing myself. I have a long history in
22 regulation, the state and federal government. I
23 first want to thank the three commissioner,
24 Solomon, Chivukula, and Gordon for being here.
25 This is an important hearing. And, it's really

1 good that you and your aids are here. I also want
2 to thank the hard-working public servants, of which
3 I've always been one, and I love you guys. And, i
4 wanted to thank the Governor for having the Energy
5 Master Plan be what it's supposed to be, which is
6 participation by all the necessary, relevant
7 departments, and not just the BPU. While the BPU
8 is responsible and chairs it, you guys have to be
9 in the game. And I'm really thrilled that the
10 Governor has all the cabinet officers who are
11 involved involved in this.

12 This is a real exciting time for you
13 all, the commissioners, to start the new energy
14 future for New Jersey. We need to get there.
15 We've been thinking about it, talking about it,
16 working on it every once in a while. But this is
17 the really great opportunity to plan this and do it
18 right.

19 I want to talk about a couple of
20 things. One is off-shore wind. Now, I
21 congratulate you for putting out the RFPs. That's
22 a good first step. I see off-shore wind as a
23 replacement for nuclear power plants as base load
24 generation. The two nuclear plants will be going
25 off in the 2040s. I expect to be around when

1 they're still going off -- and they can, because
2 they're just so big, they'll be out there. It's
3 very windy up there and high, and the new turbines
4 for Europe are pretty incredible.

5 And, what I want to talk about,
6 though, is the backbone transmission line. We
7 have been talking about this for fifteen years.
8 At one point in time we had chairs of the
9 commissions of Delaware, D.C., Maryland and Jersey
10 going to pursue that with PJM. Unfortunately,
11 that was a number of years ago. And now it's a
12 whole different thing. But, I think the backbone
13 transmission line is clearly needed. And should be
14 a competitive process in RFP. There are at least
15 two who are interested in doing that. And it
16 really should be part of your off-shore wind study.
17 I don't know if it is or not, but it really needs
18 to be.

19 There's a lot of reason for the
20 transmission line, which will be part of the PJM
21 grid system, it be treated like the PJM
22 transmission lines are treated. And, the reasons
23 are really it's windier in certain parts. So, you
24 talk about Virginia up to northern New Jersey.
25 It's windier in some parts than in other parts at

1 different times, that line will take that
2 electricity where it's needed. I know that Europe
3 -- not Great Britain, but the rest of Europe,
4 Germany I know, put out an RP separately for
5 transmission, treat it as part of the grid system
6 -- as I think we should do, separately from the
7 off-shore wind that they have for those developers.
8 It should be a normal part of PJM's grid. I also
9 note that the OREC -- which is really not a good
10 for it, but anyway -- the OREC is paid for by every
11 ratepayer in the state of New Jersey, including
12 those in north Jersey where it's most congested and
13 the electricity is the most costly. That we have a
14 backbone transmission line, and then they can see
15 some of the benefits for which they're paying. We
16 don't have a backbone transmission line, most of
17 the initial wind will be in south Jersey, where the
18 electricity is less costly. And, if you have a
19 backbone transmission line, those who are paying
20 for the electricity in north Jersey can get some of
21 that benefit. It will help cut the congestion
22 cost, which is the most costly electricity that we
23 have in the state.

24 I also note there's a group called the
25 Power Buoy. We gave them some money in the first

1 decade of this century to do some research. And,
2 they're located off of Great Britain. I think
3 they're also of the northwestern United States. We
4 couldn't have them here independently. They're
5 maybe fifteen, twenty feet above the water line,
6 and then they go down below and they use the power
7 of the water -- which the ocean has a lot. It's
8 not effective individually separately here. It is
9 where there's no outer continental shelf. Like off
10 of Great Britain, and off of northwester United
11 States. However -- and, it would have at least
12 ten, twelve years ago talking to that company.
13 Those power buoys would also be very effective
14 hooked up to the backbone transmission line. It
15 would make them then cost-effective. They are not
16 cost-effective if they're out there by them. So,
17 there are a lot of reasons. It be less cost in the
18 long-term. Off-shore wind will be hopefully a
19 developing industry over the next thirty years,
20 with more going out and more going on it, so long
21 term it's more efficient, more cost-efficient.
22 And, I urge you to put that as part of your Energy
23 Master Plan study, and to consider it in your
24 timetable for every two years or every eighteen
25 months when you develop the RFP for off-shore wind

1 developers. You also factor into that timetable
2 the backbone transmission line, so people have
3 certainty about when the bid is going to be and
4 that they will have -- developers will have the
5 backbone transmission line to hook into in the
6 future. They will not be doing their own
7 transmission. Honestly, your initial RFP, maybe
8 the next one or two after that, you have to figure
9 out how that works. But, in the long term we
10 definitely need that. And, I suggest and urge you
11 to factor it in.

12 Secondly, regarding solar. New
13 Jersey, obviously we know, is the most densely
14 populated state, we have over 90,000 PV
15 installations in the state now. And, there are
16 some developers who want to do big solar farms,
17 build them in South Jersey where the land is cheap.
18 The distribution lines are rural binds, and the
19 land costs a lot less so you can make more money.
20 As you all know, New Jerseyans, we vote all the
21 time for open space preservation and farmland
22 preservation. I suggest in our state -- and this
23 is not place for most cases solar farms. I can
24 see a solar farm if it's used locally by that farm
25 for their situation, or somebody who's a neighbor.

1 But you don't want to have places down in south
2 Jersey -- I don't know how many now -- but, where
3 you cannot put solar on your roof because they have
4 these darn big solar farms there taking up the
5 distribution line. That should not be allowed.
6 We have plenty of roofs, we have plenty of parking
7 lots. Cost a little more to do that, it's a more
8 costly part of the state. But, that's where the
9 people and the use for electricity is. So, I urge
10 you to look at that, and really have it geared
11 towards rooftops, parking lots, brown fields. Not
12 landfills, it's too costly -- unless the owner
13 wants to eat up the additional cost.

14 Thirdly. Alternatives transmission --
15 alternatives. Same thing. Couple of people have
16 talked about that. We were going to start to do
17 that back when Mitchell Weiner was the director of
18 the Energy Division, with that PSE&G line coming
19 into Roseland line. We didn't have time to do that
20 kind of study at that point in time, so it went in,
21 it was needed. We need to work with other states.
22 A lot of going on in other states. California ISO.
23 Independent system operator is doing the study now.
24 The final report will be done in November.
25 Looking at transmission to alternatives for the

1 whole independent operator of California. Also,
2 New York and some other states have been working on
3 this. We need a strong BPU policy now in this
4 Energy Master Plan that has as a policy, a Board
5 policy, alternative transmission, and non-wire
6 alternatives need to be looked at first before the
7 transmission line is built. You do not want
8 stranded costs for the next four years. And, we
9 know that that will in fact happen if you put them
10 in unnecessarily. So, I urge you to look at that.
11 Customers clearly want DER, and that's clear with
12 what's going on now. So, we have extreme weather
13 like Sandy, and climate change is getting worse and
14 worse and worse. If we stopped everything now, we
15 still have increasing extreme weather in the next
16 twenty years. So, this is getting worse. Which
17 means that customers know that. Commercial,
18 industrial facilities and owners know that.
19 There's also the addition of physical or cyber
20 terrorism. And, I note that the Defense Department
21 is very much into building microgrids. They've
22 been doing that since the 90s, at least, when I was
23 a VP they were working on that because they
24 understand the concerns.

25 The Solar PV, people have it. But we

1 have Sandy, a lot of people thought well, I have my
2 solar. Well, you don't, because you have to
3 disconnect it from the system for safety to the
4 workers, for the distribution company. What we
5 need is smart inverters. So I was out for six days
6 with my -- solar system burnt, didn't have a smart
7 inverter, makes sense. There are ways now to do
8 that. It's doable. There's a lot of the
9 engineering types. I know that. But Maryland I
10 think has been working on a study on smart
11 inverters. At least that will allow me the day
12 after, when it's sunny after Sandy, that I can have
13 electricity then. Obviously, customers want
14 energy storage, either commercial/industrial or
15 residential. Because then when we have the extreme
16 weather events will and are increasing -- they'll
17 be able to be up and running after the storm
18 further on a little mini grid, at least when they
19 have the sun. And if they have storage then they
20 can have it for a while longer.

21 On microgrids, we need -- my
22 recommendation is a vision of small microgrids for
23 any community, any municipality of any size where
24 their emergency management system, the fire
25 department, the police department, and probably

1 some kind of community center, can be on this
2 microgrid. With probably initially having to be
3 combined heat and power. But, as I think most of
4 you know, Princeton University during Sandy didn't
5 lose any of their little critters in their test
6 labs because they have a microgrid. And they went
7 off the system, and they actually monetized that
8 system when there isn't an outage, so it worked
9 well. N.Y.U. lost all the little critters in their
10 labs because they didn't have back up. Rutgers
11 lost some, didn't lose others. Well, it's more
12 than that. We have a lot of industries who are
13 doing innovation technology stuff here. We need
14 the energy storage to go with our DER, as well.
15 And, I think that you're doing the study on that
16 sometime as required. But I think that's really
17 important.

18 Finally, redesigning our electricity
19 system. Michael and I have been talking about this
20 for twenty-five years. There is -- and, I suggest
21 you use his brain, because it's really good on that
22 stuff. Obviously we all want reliability, we want
23 resiliency, and we want it at least cost. I know
24 having done environmental for ten years in between
25 my other stuff, my BPU stuff, most people don't get

1 these costs. They don't understand that ratepayers
2 -- be it commercial, industrial, businesses, large
3 energy users, or residential -- can't afford it.
4 We have high rates. It's not as high as they have
5 been, but it's still going to be high. Especially
6 with all the improvements that we're going through.
7 So, we really need to re-design this. And this is
8 the Energy Master Plan they started doing. Look at
9 what California is doing, look at what Maryland has
10 discussed, what New York has done. They've made
11 mistakes in some areas, all of these; but, they're
12 working on it. Work with those entities. We need
13 the smart generation distribution systems,
14 microphasers and stuff, the union guy was talking
15 about. We need two-way communication. The
16 electric distribution company should be able to
17 turn on and turn off for demand response or peak
18 shading. My appliances in my home -- and I'm not
19 there, I don't want to know anything about it, just
20 have my refrigerator or whatever it is, like we do
21 with air conditioning cycling -- we've been doing
22 that for 25 years -- they can control it, the EDC
23 control it, these smart appliances. And you also
24 need, obviously, the two-way communication. One
25 minute? Okay, Mike.

1 And, the final thing I'd like to talk
2 about is modernization of the DER. I think that
3 it's been worked on here and there, but how to
4 monetize that. Aggregation selling into the PJM
5 system for monetization, but also I think an
6 aggregation obviously helps with that. But
7 avoiding costs are a way of doing that. If somehow
8 you can monetize that. And, I know the Rocky
9 Mountain institute is working on that with some
10 group. Thank you.

11 (Whereupon a short recess was held.)

12 MR. BOYD: All right. Mr. Davis.

13 MR. DAVIS: Hi. My first time
14 attending one of these -- I say I guess my first
15 time as an adult participating in anything
16 political other than voting. So, very interesting
17 and a wonderful opportunity. Excited about the
18 Governor's new initiative. I think what was funny
19 as we were chatting before, is this whole idea of
20 how all these agencies are connected. I'd like to
21 think the same thing for the modern grid. I've
22 always been interested in energy. I started my
23 career and moved to New Jersey with -- the train
24 company was my first employer. I lived here ever
25 since. It's interesting to see how the state's

1 stranformed. It's interesting to see how wonderful
2 the state is with offering incentives and
3 encouragement in different industries that might
4 benefit the citizens.

5 I'd say one message would be, again,
6 echoing what's happening here, is I think we can
7 all get behind the idea of a microgrid. Certainly
8 an easy transition to a future grid. I actually
9 work currently for a manufacturer based in
10 California that makes combined heat/power
11 micro-turbines. And they're commonly applied to
12 microgrid applications. I think, you know, in
13 living in the state since I have it's interesting
14 to see how portable takes have taken off. There's
15 probably a lot more room for growth for that type
16 of solar power, wind power, certainly is coming on
17 board and excited to see these changes. I'd say,
18 you know, the next few years it's fairly obvious
19 that storage is going to take off and play a very
20 significant role, as well. And, again, I always
21 remind myself we shouldn't be picking winners or
22 losers, we should be looking at these systems in
23 the abstract.

24 So, storage also includes thermal
25 storage. You know, solar portable takes also can

1 be solar thermal powered. There's a lot of ways
2 to transfer energy. And combined heat/power is
3 certainly part of a modern microgrid, and can also
4 be a clean form of using combined heat/power
5 technology to further our grid, to add resiliency,
6 to use waste products which is biomass which are
7 ample in the State of New Jersey. I think
8 collaboration is the key for us to move forward as
9 a state. I think learning from nearby states is
10 also a wonderful opportunity. Not to do everything
11 yourself, but look to others who are leading, such
12 as the State of Maryland. The State of
13 Pennsylvania certainly is doing a lot to break down
14 historical barriers to the adoption of technology.

15 In my mind, the best thing we can do
16 here today is to agree not necessarily on what the
17 future's going to look like -- I think if we knew
18 that we wouldn't need to be here today -- but,
19 rather, we should be agreeing on what barriers are
20 still existing from the old legacy that Thomas
21 Edison gave us a hundred years ago of how we create
22 power. As an observer, also the construction
23 industry, I'd like to encourage people to really
24 understand that the people that are developing and
25 revitalizing -- I live in West New York, New Jersey

1 myself, and in the twenty years I've been there the
2 neighborhood has gone from the dark coast to the
3 gold coast. And I look at how people have decided
4 to come back to that part of Hudson County and
5 redevelop it. And are these incentives or programs
6 that the state is offering being a part of it, and
7 I'm sorry to say no. I look at most of the
8 redevelopment that's gone on in New Jersey, at
9 least where I live has been largely residential,
10 it's been largely developer-based opportunities for
11 making money as opposed to are we really building a
12 modern grid or a resilient or a truly energy saving
13 project. So, I think somehow or another the BPU,
14 with its leadership, needs to kind of engage that
15 audience and make it easy to do these programs, to
16 make it easy to take incentives and put them to
17 use. As opposed to creating incentive programs
18 that might not actually effect the market.

19 I will look to our neighbor across the
20 river in New York. And it took them a long time,
21 but it's almost shocking to watch how almost every
22 developer now in New York City is taking advantage
23 of the programs. No one's building a new
24 residential structure in New York City without
25 first taking advantage of the free boilers. And

1 they're not free boilers. In New York City my firm
2 has done a good job of promoting combined
3 heat/power and solar, and some other things. And
4 they're all building these technologies into the
5 buildings because they realize it's to their
6 economic benefit, and they're easy to access.

7 One of my friends in Philadelphia, I
8 asked him for advice on why isn't New Jersey
9 putting in more of this stuff that I'm trying to
10 provide. And, he summarized that thought very
11 eloquently, which is, the engineers -- and, again,
12 everyone probably here might be an engineer,
13 doesn't mean you're practicing -- but we make it
14 overly complicated. And, the other advice that he
15 said was, well, nobody is going to get fired for
16 buying power from the local gas or electric
17 company. So, as we look at microgrids we really
18 have to figure out a way to be easy to do business
19 with as a state, and eliminate barriers.

20 And that's it for me. I really
21 appreciate the chance to be here. I did notice
22 today we're on Facebook, so maybe in the future we
23 can do Facebook Live.

24 MR. BOYD: All right. Dr. Jubilee,
25 Prisar Brown. Followed by Mr. Ogden. And next

1 after that will be David Giordano.

2 DR. JUBLEE: Good morning, everyone.
3 Thank you for this opportunity to speak. So, my
4 name is Jublee. I'm from Rutgers University. I
5 just recently graduated with a PhD in mechanical
6 engineer. A couple of years ago Commissioner
7 Chivukula, he came and visited our lab and saw the
8 research we were doing towards energy. So, today
9 I want to talk about -- forgive my clothing style,
10 I drove my motorcycle here so I'm wearing jeans.

11 So, today I want to talk about three
12 important things. As we go towards a hundred
13 percent renewable energy reliance. So, one is the
14 internet of things, and using electric vehicles for
15 effective demand response. Second one, is planning
16 optimal capacity mix. Third topic is solving poor
17 quality shifts.

18 So, the first one, utilizing internet
19 of things and electric vehicles for effective
20 demand response. So, electric vehicles have been
21 growing at ten times the rate in the past four
22 years, and they're expected to grow at fourteen
23 times the rate in the next few years. And, they're
24 going to hold a major share of cars on road. And
25 electric trucks, which are used in the

1 transportation industry, are also growing very
2 fast. And, they're going to completely replace
3 gas and diesel trucks in the very near times. So,
4 they need a lot of current for charging. So, many
5 of the speakers that are talking about using the --
6 so we don't have a lot of demand at nighttime, so,
7 we can charge these electric vehicles up to 95, but
8 each electric car using the fast charging can use
9 up to fifty times the power needed for to charge a
10 house or use in a house. So, the house uses like
11 two kilowatts, an electric car needs about fifty
12 kilowatts or a hundred kilowatts. So, if you have
13 ten cars in a small neighborhood, it's going to
14 fail the microgrid very fast. So, we need to plan
15 for things like that. So, while I was doing
16 research from Rutgers I took a course called Energy
17 Systems where I did a simulation of a microgrid
18 using electric vehicles, where the electric cars
19 talk with the microgrid and they come to an optimal
20 demand response time. So, if the car needs energy
21 and the person needs to travel somewhere, the grid
22 will transport energy to the car. And if the
23 person, the car owner, doesn't need to travel
24 anywhere and there's no sun or there's no wind,
25 then the battery can discharge back to the electric

1 grid. So, it's just called V2G system. So, we
2 need to come up with those internet of thing,
3 technologies, to have a communication between
4 electric vehicles and the microgrid. So, we need
5 to build systems like that.

6 So, the second topic is planning
7 optimal capacity mix. So, planning is very
8 important when we're trying to make these quick
9 changes to the grid system and using, utilizing
10 renewable energy systems. And I read a research
11 paper which, a couple of years ago, which studied
12 the PJM grid for like twenty years. I did a lot of
13 data analysis on how much wind power do we need,
14 how much solar power do we need, how much storage
15 do we need. So, without planning we will not know
16 how we need to distribute those resources. And,
17 it also depends on the climating conditions of
18 states. So, for New Jersey I want to stress the
19 point that we need to do some data analysis of
20 historical data that's available from the New
21 Jersey or PJM grid, and determine the solar power,
22 the wind energy, and the storage needs of the
23 state.

24 The third topic that I want to talk
25 about is solving poor quality issues, which is one

1 of the biggest issues with renewable energy because
2 when the cloud goes away the sun comes out, the
3 energy from the solar panels quickly ramps up and
4 we are faced with poor quality issues like the
5 voltage goes about the standard value that's set
6 for the frequency changes. So, recently I read an
7 article written by the wise president of Fasolar,
8 Dr. Morteria. He said that we need to come up with
9 new agreements, power purchase agreements, to solve
10 these issues because power-producing people they
11 don't want to lose energy. So, the way to solve
12 these power quality issues is we need to raise some
13 energy. Right? So that when it's ramping up we
14 can raise some energy so the voltage still remains
15 within the standards. If we lose energy, the power
16 producers would lose money, so they don't want to
17 do it. So, the government needs to come up with
18 certain changes to their agreements so that they're
19 still paid for that energy that they're losing so
20 that we can still maintain the right power quality.

21 So, those are the three things we need
22 to talk about, wanted to talk about. And, we need
23 to use data analytics and new technologies that are
24 coming up, like machine learning which a lot of
25 companies are trying to do. I saw General

1 Electric Company posted some jobs for people with
2 machine learning experience, that they want to look
3 into all the data that's available from all the
4 wind turbines, all the solar panels. So, they want
5 to look at the data and see how they can improve
6 the grid, improve the distributed energy system.
7 Same way other companies are also looking into data
8 analytics. And, implore BPU to also use these
9 modern technologies to improve the reliability of
10 the grid, and find the optimal capacity mix for the
11 state. So, thank you very much for this time.

12 MR. BOYD: Thank you. Mr. Ogden,
13 followed by David Giordano. Matt Davey, are you
14 here? Okay. And, David Kingle. No?

15 Okay. So, these will be our final
16 two speakers. And, if you do wish to speak please
17 give me a wave after the final two speakers.

18 MR. OGDEN: Thank you very much. Good
19 afternoon, Commissioners, Madam Chairwoman,
20 committee members, ladies and gentlemen. My name
21 is Henry Ogden. I'm an Assistant Deputy Rate
22 Counsel for the New Jersey Division of Rate
23 Counsel. These are preliminary comments, and we
24 will submit brief comments by the October 12th
25 deadline.

1 In the interest of brevity, I'm going
2 to do just bullet point responses to the thirty
3 points. First is the modern grid. What does it
4 look like in 2030, 2050? When you consider the
5 grid now, some electric distribution companies have
6 components that are over seventy years old, some of
7 the substations. It's clear certain components
8 will require timely replacement and modernization.
9 But they have to do that while providing safe and
10 reliable service. That doesn't change.
11 Distributed generation, electric vehicles, smart
12 grid technologies, electrification, demand site
13 management, all of these things have created
14 different opportunities for the EDCs to address and
15 manage. But what hasn't changed is the electrons
16 moving from the generation to the meter. We're
17 moving from centralized generation to a
18 decentralized system, which will require more
19 monitoring and a more responsive grid. This grid
20 is not going to change over night. It has to be
21 gradual, deliberative, and transparent process that
22 will deliver this safe and reliable grid at a
23 reasonable cost to the ratepayers.

24 Number 2; critical steps. First
25 consider what components are obsolete, which are

1 adequate, which future components will address the
2 future needs, and which components provide most
3 benefits to the ratepayers at a reasonable cost.
4 And, how do you prevent over building of the
5 distribution grid. The EDCs have the ability to
6 gradually modernized the grid and recover these
7 costs with no on base rate case. And, the
8 adoption of N.J.A.C 14:3.2A also creates a
9 mechanism for them to modernize the grid.

10 Number 3; climate change. The
11 evolving grid should enable the adoption of the
12 cost-effective distributed energy resources and
13 technology at a decreased customer outage duration
14 and incidences, and also decrease customer utility
15 bills and usage. It should enable the adoption of
16 technologies that decrease carbon emissions at a
17 reasonable cost to customers, and allow all
18 technologies to compete on equal footing.

19 Number 4; fuel diversity. New
20 Jersey's RPS requirement and the recently adopted
21 SECs to zero emission credit, in addition the
22 off-shore wind, all of these policies are
23 encouraging fuel diversity and renewable adoption.

24 Number 5; integrated distribution
25 planning. It's important to have a purposeful and

1 transparent process to ensure that all utilities
2 are appropriately planning and all technologies are
3 being fairly evaluated, and the ratepayers are
4 being protected.

5 Number 6; global warming response.
6 The grid should allow integration and delivery of
7 more cost-effective renewable generation, and
8 demand site management to reduce carbon emissions.

9 Number 7; a state policy to support
10 modern grid. They all should require regular
11 planning, evaluation, transparent evaluation of
12 technologies, and that would provide certainty for
13 the utilities and also so that the costs are
14 reasonable, and that the benefits outweigh the
15 costs.

16 Number 8; what regulations need to be
17 updated? Utilities have devoted to modernize the
18 grid through normal rate making, and they should
19 also have performance metrics to match the goals of
20 the policy makers. These performance metrics
21 shouldn't be developed just for the sake of
22 reporting.

23 Number 9; regulated rate design and
24 tariff structures. N.J.A.C. 14:3.2A already
25 encourages distribution utilities to accelerate

1 infrastructure investments. And, Rate Counsel will
2 continue to study that issue.

3 Number 10; what could the state do to
4 manage energy costs? It can reduce overall energy
5 consumption across the EDCs, and reduce their load
6 share allocation for future regional transmission
7 which may delay the need for future projects.
8 Cost-effective renewables and DSM will also reduce
9 overall energy costs for the participants and
10 non-participants through a price mitigation.

11 Number 11; how should costs be
12 allocated? They should be allocated fairly among
13 the beneficiaries of the upgrade, and the operation
14 of the grid. Cost causation principles should be
15 maintained even though that becomes more difficult
16 with distributed generation and volume metric
17 pricing.

18 Number 12; the interface between
19 energy distribution systems. That depends what you
20 mean by that. If it includes microgrids, it is a
21 question of who owns those, who controls them, and
22 how they might be operated to benefit the overall
23 grid, and who pays for them. So, there's
24 certainly questions to be answered there. And
25 we'll go into that more for our written comments.

1 In terms of incentives. Again, that's
2 a similar on the issue, where does one draw the
3 line on those. We'll provide more comments on
4 that.

5 Number 14; how do you address
6 interdependencies between energy distribution
7 systems? Well, the storm hardening strategies that
8 some of the utilities have recently adopted, that
9 may be an example. Those programs with a targeted
10 investments to focus on critical infrastructure
11 within its service territory. And, these
12 investments may also benefit the overall
13 distribution system.

14 Number 15; how can a modern grid
15 utilize these new technologies? If it facilitates
16 the adoption of numerous cost-effective
17 technologies, both in terms of distributed
18 renewables and demand site management, these
19 technologies should lower utility bills for
20 ratepayers.

21 16; How do you make the distribution
22 system more efficient? You can encourage the
23 reduction of energy usage through cost-effective
24 means. That's still a good way to do it.
25 Technologies that would reduce energy losses still

1 need to be cost-effective.

2 17; technology, how can that assist?

3 All the technologies mentioned in the question
4 could benefit the grid, but they should demonstrate
5 cost-effectiveness. And the adoption of additional
6 distributed energy resources may require localized
7 control and visibility to ensure appropriate system
8 tolerances. And the EDCA should have detailed
9 knowledge of their system in order to adequately
10 plan for increased distributed energy resource
11 penetration.

12 18; who should own the data? To date,
13 advanced meter infrastructure has not be broadly
14 implemented. Ownership of the data needs to be
15 mindful of privacy. Also, the economic value of
16 such information needs to benefit the ratepayers,
17 not just the private entities.

18 19; advanced distribution monitoring.
19 The utilities need to make the business case that
20 such investments are necessary and cost-effective
21 to benefit ratepayers.

22 Number 20; natural gas leak detention.
23 Federal and state regulations currently outline the
24 frequency of leak inspection for gas
25 infrastructure. New Jersey has to continue to

1 work in tandem with the federal authorities to
2 ensure the safety of gas operations by the
3 utilities.

4 21; cyber security. New Jersey has
5 New Jersey cyber security and communications
6 integration cell. New Jersey could consider
7 following FERC 848, and require the reporting of
8 attempted cyber security breaches.

9 22; security risks of expanding
10 distributed energy. Increased automation and
11 communications of the grid creates opportunities
12 for cyber security breaches, and increases the
13 impact of the cyber security breaches in terms of
14 data breaches and operational impacts.

15 23; what can the state do? The New
16 Jersey cyber security and communication integration
17 cell could provide a forum for the utilities to
18 share Best Practices to prevent and mitigate these
19 breaches, and provide a repository for the reports.
20 But cost-effectiveness should be a consideration.

21 24; work force training. The
22 utilities are facing the retirement of the
23 staffing. It would be in the best position to
24 identify what skills are needed to create and
25 operate a more connected and integrated grid.

1 These skills require probably like other industries
2 facing automation and integration of increasingly
3 technologies.

4 25; new or existing industries. The
5 installation and maintenance of electrical
6 equipment should remain local. And the development
7 of cloud-based integration software solutions could
8 be fostered here.

9 26; environmental justice. The cost
10 of grid modernization should not be born by the
11 disproportionately affected communities. It needs
12 to benefit all disadvantaged communities by
13 improving service reliability and lowering overall
14 bills.

15 27; energy efficiency. Rate
16 structures should be needed to enable
17 cost-effective energy efficiency, distributed
18 energy resources, and variable renewable energy
19 resources to make sure they're appropriately valued
20 and implemented to well work energy cost to both
21 parts and non-participants.

22 Number 28; current barriers.
23 Barriers include imperfect information, split
24 incentives, lack of capital, high transaction. All
25 of those we'll submit more in our written comments.

1 And, finally, 28 and 29; what policies
2 limit the barriers participation by the
3 disproportionately impacted communities. The
4 requirements in distribution planning should
5 benefit dispiritedly and impact the communities,
6 limit bill impacts of infrastructure investments
7 for these disproportionately impacted communities.

8 Thank you very much for your
9 attention.

10 MR. BOYD: Thank you.

11 MR. WINKA: And, you did that all that
12 with just over thirty seconds.

13 MR. BOYD: And I'll take this last
14 chance here. Anybody that has not had a chance to
15 speak or would like to speak, please raise your
16 hand. Seeing none --

17 MR. GIORDANO: Good afternoon. My
18 name is David Giordano. I'm the head of Governor
19 relations for Doosan Fuel Cell America, which is a
20 fuel cell manufacture located in South Windsor,
21 Connecticut.

22 Doosan Fuel Cell is a global leader in
23 providing clean, continuous-duty, cost-competitive
24 stationary fuel cell energy systems. Our combined
25 heat and power PureCell systems operate 24/7 with

1 high efficiency and ultra low emissions, allowing
2 our customers to generate their own electricity and
3 heat on site while reducing their utility expenses
4 and environmental emissions. With over twelve
5 million fleet operating hours, PureCell systems
6 have demonstrated unparalleled durability and
7 reliability. Doosan Fuel Cell is a subsidiary of
8 the Doosan Corporation, which is a global company
9 with 42,000 employees and worldwide revenues of 20
10 billion dollars.

11 Doosan has significant experience in
12 customer-sited behind the meter applications. Our
13 PureCell Model 400 systems operate at more than
14 fifty sites throughout the U.S., providing nearly
15 40 megawatts of power. Worldwide, Doosan has more
16 than 210 units deployed, producing 100 megawatts
17 with many more megawatts coming on line in the next
18 year. The reliability and resiliency attributes of
19 our fuel cells are felt during grid outages where
20 our systems continue to run, providing essential
21 electricity and heat to critical facilities. Such
22 was the case here in the northeast during winter
23 storm Alfred in 2011, and Superstorm Sandy in 2012.
24 Doosan fuel cells kept the power on during these
25 critical times of need.

1 Doosan Fuel Cell is excited to see
2 that Governor Murphy and the state of New Jersey
3 are committed to exploring ways in which to build a
4 better and more modern grid. We look forward to
5 the fact that fuel cells can play a major part in
6 achieving this goal. We feel that enhancements to
7 maintain security and reliability should include
8 technologies that can island from the grid and
9 create resiliency and diversify the energy
10 portfolio to avoid gaps in generation caused by
11 intermittent renewables. Stationary fuel cells
12 provide firm power at both the utility scale as
13 well as on the customer side of the meter. Fuel
14 cell systems can be installed to provide heat and
15 power for entire communities, using the existing
16 natural gas infrastructure or running off renewable
17 fuel.

18 Doosan is experience the success of
19 large utility scale applications outside of the
20 U.S. Korea is using hundreds of megawatts of fuel
21 cell systems to modernize their grid. Fuel cells
22 help Korea meet their RPS goals better than
23 intermittent wind and solar. Also, in densely
24 populated areas, land constraints limit large scale
25 renewables, whereas fuel cells can be installed on

1 a very small footprint. These fuel cell systems
2 function like substations providing primary power
3 and heat, even when the grid goes down. For
4 example, in Korea, Doosan has installed 30.8
5 megawatts of fuel cells for district heating and
6 electricity for 71,500 homes in the City of Busan.
7 Our fuel cells are configured in a tiered structure
8 sitting on only one acre of land, whereas an
9 equivalent 30 megawatts of solar farm may require
10 more than 75 acres.

11 Doosan is also currently installing a
12 50 megawatt fuel cell system in Korea that will run
13 on direct hydrogen. The hydrogen is a by-product
14 of a chemical plant that will be used to run our
15 fuel cells, and therefore giving the electricity
16 back to the utility.

17 Doosan is currently working with
18 microgrid developers in Connecticut and New York to
19 improve redundancy and reliability to create a more
20 modern grid. We feel that New Jersey with benefit
21 from a grid with a diverse portfolio of
22 technologies for reliable modernization.

23 Also, from an environmental justice
24 standpoint, by valuing the reduction of criteria
25 air pollutants in addition to GHG reductions, the

1 State can provide an important benefit to
2 disproportionately impacted communities.

3 Stationary fuel cells are a valuable
4 contributor to the state's clean energy strategy,
5 providing power that is continuous, efficient, and
6 resilient. Doosan continues to support the New
7 Jersey Energy Master Plan, and believes that fuel
8 cells will play a major role in providing on-site
9 distributed generation, as well as larger
10 multi-megawatt utility scale projects.

11 Doosan Fuel Cell looks forward to
12 continuing to work with the State of New Jersey on
13 this and other very important issues. Thank you.

14 MR. BOYD: Thank you, sir. That
15 concludes the speakers list at this point. Mr.
16 Winka.

17 MR. WINKA: Unless there's anybody
18 else, the comment period is open until October
19 12th, close of business. Our next session is this
20 Friday here at ten o'clock on the Sustainable
21 Infrastructure, and that's on the basically the
22 transmission side and the competitive markets. So,
23 some of the comments today should be repeated and
24 provided to Cynthia Hollands, who is back there in
25 the room, at the next session.

1 So, thank you very much. And we look
2 forward to your comments and further discussions on
3 the Energy Master Plan.

4 (Whereupon the proceedings were
5 concluded at 1:00 p.m.)

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C E R T I F I C A T E

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3 I, CHRISTINA RESTUCCIA, a Court Reporter
4 of the State of New Jersey, authorized to
5 administer oaths pursuant to R.S.41:2-2, do hereby
6 CERTIFY that the foregoing is a true and accurate
7 transcript of the testimony that was taken
8 stenographically by and before me at the time,
9 place and on the date herein before set forth.

10 I DO FURTHER CERTIFY that I am neither a
11 relative nor employee nor attorney nor counsel of
12 any of the parties to this action, and that I am
13 not financially interested in the action.

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Notary Public of the State of New Jersey
My Commission expires November 14, 2021
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