UNITED STATES DEPARTMENT OF ENERGY

ELECTRICITY ADVISORY COMMITTEE MEETING

Arlington, Virginia

Friday, January 24, 2014

PARTICIPANTS:

BILLY BALL
Southern Company

ANJAN BOSE
Washington State University

MERWYN BROWN
California Institute for Energy & Environment

PAUL CENTOLELLA
Vice President, President Analysis Group

RICHARD COWART
EAC Chair

BOB CURRY
Commissioner Emeritus, NY; Charles River Associates

MIKE HEYECK
The Grid Group

PAUL HUDSON
Stratus Energy Group, Austin

SUE KELLY
American Public Power Association

MARK LAUBY
North American Electric Reliability Corporation

RALPH MASIELLO
DNV KEMA Energy & Sustainability

CLAIR MOELLER
Midcontinent Independent Transmission

SONNY POPOWSKY
EAC Vice Chair

PARTICIPANTS (CONT'D):

WANDA REDER
S&C Electric Company; IEEE

PHYLLIS REHA
Commissioner Emeritus, Phyllis Reha Consulting

PAUL ROBERTI
Rhode Island Public Utilities Commission

CHRIS SHELTON
AES Energy Storage

TOM SLOAN
State Representative, Kansas

DAVID TILL
Tennessee Valley Authority

GORDON VAN WELIE
ISO New England

REBECCA WAGNER
Nevada Public Utilities Commission

CARL ZICHELLA
Natural Resources Defense Council

CAITLIN CALLAGHAN
Office of Electricity

IMRE GYUK
Office of Electricity

DAVID MEYER
Office of Electricity

MATT ROSENBAUM
Office of Electricity

BAJ AGRAWAL
Arizona Public Service Co.

PARTICIPANTS (CONT'D):

MIKE BERLINSKI
Beacon Power, LLC

AVTAR BINING
California Energy Commission

SUMIT BOSE
General Electric

ETHAN ELKIND
Berkeley School of Law

XIAOMING FENG
ABB Industry Pte. Ltd.

RICK FIORAVANTI
DNV KEMA

RAJIT GADH
University of California Los Angeles

STEVE GHADIRI
California Energy Commission

JIMMY GLOTFELTY
Clean Line Energy Partners

ITAI KARELIC
EnStorage Inc.

KEVIN LEMM

ART MANDER
Tri-State Generation & Transmission Association Inc.

BRIAN MARCHIONINI
Energetics Inc.

TRON MELZL
American Superconductor Corporation

PARTICIPANTS (CONT'D):

CHRISTOPHER REES
Duke Energy Corporation

VINCENT SPRENKLE
Pacific Northwest National Laboratory

MIKE SWIDER
New York Independent System Operator

AARON TOWNSEND
National Renewable Energy Laboratory

JOSHUA WICHERS
American Electric Power

ELLIOT ROSEMAN
ICF International

CODI SHARP
ICF International

SAMIR SUCCAR
ICF International

* * * * *

P R O C E E D I N G S

(1:00 p.m.)

MR. COWART: I want to begin by first thanking everybody for joining the call and thanking the Committee, the Subcommittee for the doing the work to prepare the document. And to I see, you know, Codi and Samir for putting together the process for doing this.

And we haven't done this before so we have a couple of things to go over at the beginning. The first thing I'd like to ascertain is are we -- do we have a quorum for this call to be a decision-making meeting of the Electricity Advisory Committee? So can you confirm that we do have a quorum, Codi?

MS. SHARP: Yes, we do have a quorum. We have just over; it looks like four members over quorum.

MR. COWART: Okay, all right. Thanks very much.

MS. SHARP: Uh-huh.

MR. COWART: Wanted to make sure of that

before we continued. And I will as we do at the beginning of all the meetings of the Committee, I'll remind people that this is a formal official meeting of the Electricity Advisory Committee under the Federal FACA rules. And as such, the communications associated with this including public statements made are recorded and then, second, for members of the public who may wish to address the Committee, there is time set aside on the agenda for that. And if you would like to make a public comment, please let us know at the outset here so that we can plan for your comments and make provision for them later on.

I know we have some members of the public who are listening in and if you wish to make a statement at the end there is an opportunity to do so. And let me ask folks from DOE; is there anything else from their end that needs to be said at this point?

MR. MEYER: Not that I know of Rich. I think we're set to go forward, thank you.

MR. COWART: All right, and Codi or

Samir, is there anything about the process technically that you need to explain?

MR. SUCCAR: Sure, this is Samir from ICF. Thank you all for joining today. If you are not speaking given the high number of attendees on this call, please mute your phone to minimize the amount of background noise, thank you very much. And Rich, back to you.

MR. COWART: Okay, the only other useful bit of information I've picked up in the pre-call was that if for some reason you're unable to get onto the WebEx portion of this and have the slides appear more or less automatically because you're on, if you have received a set of the slides in the e-mail, you can just put that up on your own screen and just progress the slides yourselves as the presentation goes on.

Okay, with that, I think it's time to just turn to Ralph Masiello and ask him to present the report and take us through the slides.

MR. MASIELLO: Good, thank you, Rich, and let me echo the thanks to the people that put

a lot of time in drafting and reviewing the paper. Had we been able to have the ordinarily scheduled full Committee meeting physically late last year, we would have brought this up in the meeting. So this virtual meeting is a response to the fact that that meeting had to be canceled.

The Subcommittee has been working on a strategy document the past nine months or so. The origins of this were during Secretary Moniz's confirmation hearings when Senators Wyden and Murkowski asked to see a strategic plan for storage. Some of us on the Subcommittee had a conversation with Pat Hoffman about that and we were encouraged to draft a document from the Advisory Committee as a storage strategic plan with the thought that a number of issues could be raised by the Subcommittee that couldn't as easily be raised by the Department.

The Department did submit a strategic plan last fall and very much was focused on the technology, development and demonstration aspects of the Department's work as well as a summary of

the state of the art and ongoing pilot projects and demonstrations, ongoing research. A good document but focused on the Department's work.

The purpose of this plan was to look at other issues than technology development. Primarily the regulatory issues, the business issues around what are the commercial and business risks associated with storage adoption and what are the issues of communications and getting storage to the point where around the country regulatory commissions, utility planners and others are able to consider it in planning the future as they do wind generation and solar generation or demand response as examples.

So the document is not a technology plan. It's not a plan for pilot projects. It's a document that discusses these other issues. And the purpose was to identify high impact areas where the Department of Energy could provide leadership and information as well as identifying roles and responsibilities of other agencies and regulatory bodies and where providing them with

information could be very useful in advancing the cause.

If we look at slide 3, we tried therefore to keep the action plan described here within DOE's mission. And the slide quotes some language from the mission statement. The plan speaks to some of the electricity market product definition issues that impact storage and makes the point, in fact, that many of the market products or market protocols in place today were developed over time around the legacy conventional generation available or have evolved, to some extent, to accommodate renewables but certainly did not contemplate storage. And so, some of those inadvertently may represent barriers to the adoption of storage or the realization of its full value.

On slide 4, therefore, we point out the need for real stakeholder involvement. And in the document stakeholders for many walks of the energy sector life are identified and what roles they might play as we go forward.

So if we look at the high impact focus areas in slide 5, the first headline item is to say a lot more information is needed looking at the role of storage throughout the energy value chain. If you think of our energy system as a logistics and supply chain, then in every other industry storage, warehousing if you will, has an important role. It hasn't in energy except for fuel but technology is going to allow us to change that.

Second, in developing scenarios for future deployment of storage as we have developed scenarios for the future of renewables, it might be a good idea to look at what's a no regrets portfolio that includes storage. Meaning, as an example, if you believe in a region of the country renewable penetration is going to demand four gigawatts of flexible capacity that could be demand response. It could be new generation combustion turbines. It could be fast storage; what's kind of a no regrets level as a floor in planning that portfolio.

And certainly renewables integration is an area with a big role for storage. There's been quite a bit of focus on storage for some ancillaries as the low-hanging fruit increasingly on the smoothing of renewables, to some extent on time-shifting from off peak to on peak. And then we point out two new areas that are starting to rise; synthetic inertia and synthetic governor response from inverter base storage and amplify those a little bit in the plan.

Then the document identifies technology risk as a barrier and it elaborates on this to some extent saying that even if storage can be demonstrated to be -- to have a favorable cost benefit ratio per project basis in some applications that cost benefit ratio includes a life expectancy of the lifetime cost of the storage. And so, there's a fundamental technology risk until we know from experience that the technologies will indeed last the projected lifetime, whether that's 5 years or 10 or 20.

So investors and regulators are going to

be a little bit hesitant about approving widespread deployment until we're past that hurdle. And so, the plan describes possible vehicles to mitigate that risk both in terms of accelerated type life testing as well as backstop insurance against technology tech failure.

Another point that's brought up and amplified is everything else the energy industry does runs into siting issues whether it's pipelines or transmission lines or generators. Storage developed to scale and as it becomes visible to the public won't be an exception especially when you look at storage technologies that operate at very elevated temperatures or which naturally include hazardous materials. And the recent publicity around the electric vehicle fires of the batteries will certainly bring that to the public's attention, too.

So we're saying that it's time to get on with standards for safety testing and these as the basis for citing what kinds of technologies are appropriate for what kinds of sites. So those are

the high impact focus areas.

On slide 6, we're saying therefore the Department can provide a lot of information about performance and economic cost benefit and what the technological and safety risks are to the regulatory community, to investors, to utilities. And the DOE could, as it has with other technologies, be a vehicle for putting together frameworks to mitigate these technology risks.

When we look at storage, then we get to vehicle -- to grid integration and battery second life applications. These are again cases where the safety and testing standards are required. Also, there's other work going on in the Department and in the industry on next generation control systems. And these new designs and new applications developments should be considering storage as a resource in all its applications.

On slide 7, we're suggesting it's time that the Energy Information Agency starts to track statistics on storage. Planned storage projects, storage projects in use, information about the

production from them and so on.

And so, the document concludes with an action plan that's summarized on slide 8. And I don't think it's necessary for me to read the slide 8 to this group. But the action plan reflects the high impact focused areas we talked about.

So with that as an introduction, Rich, I think let me suggest that the other people who played a large role in drafting this that are on the call, Tom Sloan, Chris Shelton, Merwin Brown, feel free to offer comments at this time and then we could take a broader discussion.

MR. COWART: Excellent, thank you very much. I agree the other co-authors, what do you have anything you'd like to add?

MR. MASIELLO: Yeah, and Gordon Van Welie, Gordon's on the call, too.

MR. BROWN: This is Merwin. I really don't have much to add to what Ralph has summarized, except for I might just point out a difference that this particular plan contains from

most of the other kinds of studies done on the development and deployment of energy storage is that those had pretty heavy technical focus or foci and they tended to be and contain a list of a lot of energy technologies. So they had a strong technology focus.

We built on those in this report by focusing, as Ralph has said, more on the barriers and mostly the institutional type barriers. And then looked at what role DOE could have by looking at technology performance and demonstration and (inaudible) lifetime (inaudible). The helpful decision-making in these institutional domain of regulation and (inaudible). So --

MR. SHELTON: This is Chris Shelton. We're excited to get this in front of the whole Committee and we focused on, you know, those barriers and as we addressed this we really started with the mission of the Department also. Can you hear me?

MR. COWART: Yes, we can hear.

MR. SHELTON: Okay. So we started with

the mission of the Department as a guidepost to make sure that everything we were focusing on would match that and be consistent with that. And so, we actually highlight a couple of the pillars of the Commission in the paper which are showing on the WebEx now. And we felt like the broad mission is very clearly in, you know, storage and the advancement of storage as contemplated in the document is very much down the middle of the mission of the Department.

And the science and innovation area is where the Department has really excelled and this idea of catalyzing, a catalyzing role as an area where DOE has done a fair amount in the past on renewable, for instance, renewables and some other technologies. But where we think on the storage realm there's enormous opportunity and so, a lot of the discussion in the paper is on that topic and really saying let's keep going on the science and innovation pillar and keep that work progressing.

But let's expand into a few other areas

particularly as Ralph said, on educating the stakeholders. It's not really trying to influence the stakeholders but it's providing them with the tools to do the proper analysis of the possible outcomes of more adoption of storage. So that was very much the intention. We hope that it allows the Department to forge some new ground.

MR. SLOAN: And this is Tom Sloan and I concur with my predecessors. But I would point out that a couple of years ago the Electricity Storage Association conducted a survey of PUC Commissioners and other elected officials and what they said they most -- well, one, they said that the Department including the labs were their best source of factual information. And what they particularly needed was assistance in developing models for scenarios that they haven't seen before, storage being an example.

And so, our report, you know, ties into what the stakeholders say they want and certainly is within the scope of the Department's capabilities.

MR. COWART: All right, thank you very much. Anything else from the Subcommittee? Any questions or comments from other members of the EAC?

MS. KELLY: This is Sue Kelly. I just merely want to note that I reviewed the paper and suggested a number of minor changes which were graciously accepted for which I say thank you.

MR. COWART: Yeah, this is Rich. I should also note that at least on the redline version that I looked at most recently, there were still a number of small typographical issues that I suspect someone will clean up before this is finalized. Is there a process in place to do that?

MR. SUCCAR: Sure and if you spot anything specifically feel free to pass that long to Codi Sharp and I.

MR. COWART: Okay, yes, I noticed a few things. They don't merit conversation on this call. I'll just send them to you.

MR. SUCCAR: Sure.

MR. COWART: Any other comments from the Committee? All right, are there comments from any of the members of the public who are on the call and who have registered? Are we ready to move to a vote to accept the report?

MR. SLOAN: Rich, this is Tom Sloan. I move --

MR. COWART: Tom, go ahead.

MR. SLOAN: Yeah, Rich, I move that we accept the report.

MR. COWART: Thank you is there --

MR. ZICHELLA: Seconded. This is Carl Zichella.

MR. COWART: Thank you, Carl. I think we'll have to -- it'll be hard to record a voice vote except if we ask for any members of the Committee who are opposed to the motion to indicate by saying nay at this time. I hear no negative votes. In that case, I take it that this report is unanimously approved by the EAC members participating in this call. Is there any disagreement with that conclusion?

All right, I have -- and I think our business is concluded. Is Samir or David, David Meyer, are there any announcements that you would like to make to the Committee at this time before we wrap up?

MR. MEYER: I don't have any announcements to offer.

HON. HOFFMAN: This is Pat. I'd just like to thank everybody for their hard work on the energy storage report and everything. I know we've had some struggles with getting meetings set up with unfortunate events but I'm hoping we can get back into a regular framework with the New Year starting.

MR. COWART: Pat, thank you very much and thanks for your participation here. And all right, congratulations to the Subcommittee. Congratulations to those who put together this call and I look forward to seeing you all in personal relatively soon.

MR. SHELTON: Can I ask a clerical question? What's the next step in the

process? Is this posted on the Internet? Is there a period, a waiting period? What happens next?

MR. MEYER: My impression is that the document is, in a legal sense, it's final as of now. We will make minor technical or editorial corrections, grammar corrections and punctuation, things of that sort but apart from that the thing is a final product.

MS. HOFFMAN: And it will be posted.

MR. MEYER: It will be posted.

MR. COWART: Yes, it will be posted but that's right, the process of cleaning it up should just take a couple of days.

MR.SHELTON: Okay, and then it will just be posted at that time? Okay.

MR. MASIELLO: We'll work to expedite that but let me add my thanks to everybody that put the time in. This went through many revisions and quite a few people were very, very diligent in reviewing and commenting and thrashing out the issues. And thanks to all the drafters.

MR. COWART: And I guess I'd say in closing thanks to you, Ralph, for putting this -- pulling this together and bringing it along. And for the really nice statement at the beginning about Brad.

MR. MASIELLO: Yeah, it's nice. It's really too bad Brad can't see this when you look at all the effort he put in over the years. Okay.

MR. COWART: I appreciate that you were able to add that at the beginning. All right, thanks very much, everybody.

MR. SLOAN: Rich and Ralph, just one quick thing. This is Tom.

MR. COWART: Yeah?

MR. SLOAN: Could someone send a copy of this to Brad's widow?

MR. MASIELLO: Tom, I had the same thought. We ought to do that. Wanda, could you get us her name and address and it would be best if it came from Rich. Maybe we should all sign it.

MR. COWART: I'm happy to do that,

Ralph, but I'll work with you on that.

MR. MASIELLO: Yeah, we'll get a letter together that all of us could sign and Wanda, if you could provide the specifics then we'll send it.

MR. COWART: Let's take care of that --

MR. MASIELLO: Yeah, or if (inaudible) that maybe we can provide it to Wanda and she can see that it gets to her.

MR. COWART: Right, let's just take care of this separately.

MR. MASIELLO: Take care of it offline.

MR. COWART: And we -- since this is a formal meeting of the Committee, I would appreciate a motion to adjourn.

MR. SLOAN: This is Tom. So moved.

MR. COWART: Is there a second?

MR. BALL: The second, Billy Ball.

MR. BOSE: The second from Anjan.

MR. COWART: All right, thank you. Any opposition? Hearing none, I declare that this meeting is concluded. Thank you very much.

Whereupon, the PROCEEDINGS were adjourned.)

* * * * *

CERTIFICATE OF NOTARY PUBLIC

COMMONWEALTH OF VIRGINIA

I, Carleton J. Anderson, III, notary public in and for the Commonwealth of Virginia, do hereby certify that the forgoing PROCEEDING was duly recorded and thereafter reduced to print under my direction; that the witnesses were sworn to tell the truth under penalty of perjury; that said transcript is a true record of the testimony given by witnesses; that I am neither counsel for, related to, nor employed by any of the parties to the action in which this proceeding was called; and, furthermore, that I am not a relative or employee of any attorney or counsel employed by the parties hereto, nor financially or otherwise interested in the outcome of this action.

(Signature and Seal on File)

Notary Public, in and for the Commonwealth of Virginia

My Commission Expires: November 30, 2016

Notary Public Number 351998