Electric Power Technology Platform
IERE
Newsletter
Members Only
No.094 Sep. 2017 IERE Central Office

1. Report of the 17th IERE General Meeting & Canada Forum

1-1. Outline

Date : Tuesday, 16 May 2017 – Friday, 19 May 2017
Venue : Vancouver Marriott Pinnacle Downtown Hotel, Vancouver, Canada
Hosted by : Powertech Labs Inc.
Main Theme : Electric power storage, energy conversion and impact on the 21st century power grid

Session Theme
Session 1 : The value and benefits of energy storage
Session 2 : Advances in energy storage and conversion technologies
Session 3 : Advances in power transmission and distribution systems in support of energy storage and conversion
Session 4 : Advances in technology in support of the 21st century power system

Keynote Address
(Mr. Greg Reimer,
Executive Vice President, BC Hydro, Canada)

GM / Canada Forum venue
(audience)

1-2. Day 1

1-2-1. Opening Session

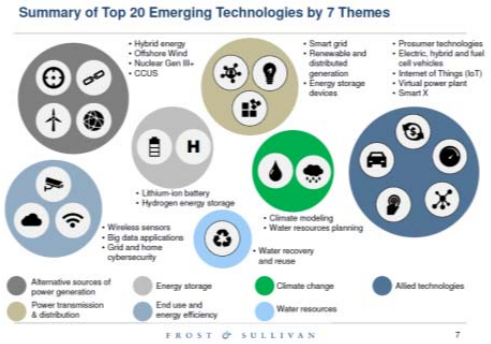
Opening Address : Mr. Gregory Tosen (Chair of IERE, South Africa)
Welcome Address : Mr. Raymond Lings (CEO of Powertech labs Inc.)

1-2-2. Keynote Addresses

K-1 Overview of BC Hydro
Mr. Greg Reimer (Executive Vice President, BC Hydro, Canada)

1-2-3. IERE General session

G1-1 Report of IERE Technology foresight 2020
Dr. John Wing Mao Cheng (Senior Manager, CLPRI, Hong Kong)



General Session was installed to introduce IERE's current project "Technology Foresight 2020". Dr. John Wing Mao Cheng, an IERE Board Member, presented outline and outcome of the project in brief.

K-1 Panel discussion:

The role and challenges of the 21st century power system centered on distributed renewable generation, long geographic distances between generation and loads, matching generation and demand, energy storage and conversion and system reliability and grid of the future.

Moderator: Mr. Raymond Lings, President & CEO of Powertech labs Inc., Canada

Panelists: Mr. Mark Lauby (Senior Vice President and Chief Reliability Officer, NERC, USA)
Dr. Sunil Chhaya (Technical Executive, EPRI, USA)
Mr. Vicente J. Gonzalez-Lopez
(Head of Department, R&D and EU Projects Department, REE, Spain)
Dr. Luan Wenpeng
(Professor/Chief expert, Distribution Automation Department, CEPRI)
Prof. Toshiya Nanahara
(Professor, Department of Electrical and Electronic Engineering, School of Engineering, Tokyo Institute of Technology, Japan)
Mr. Brian Moghadam (Business Development, Powerex Corp., Canada)
Mr. Greg Stanway (BC Hydro, Canada) & Dr. Vidya Vankayala (Powertech Labs Inc., Canada)

Examples of the short presentation at the Panel discussion.

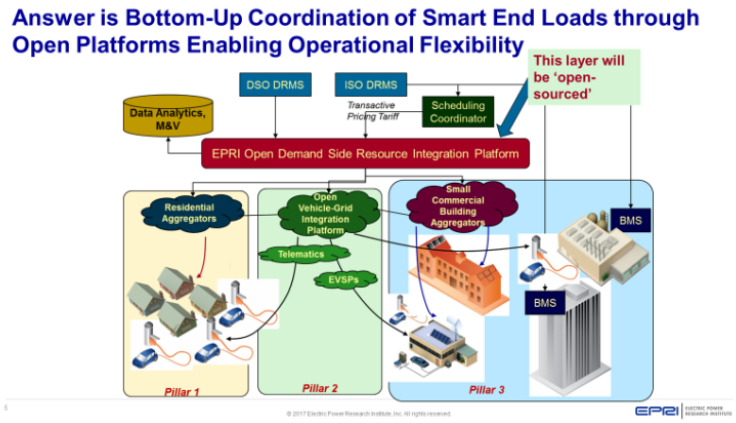


Fig.1

Integrated Energy Network - Bottom-Up Resource Integration Platforms

Dr. Sunil Chhaya (Technical Executive, EPRI, USA)

Fig.2

The role and challenges of the 21st century power system

Mr. Vicente J. Gonzalez-Lopez

(Head of Department, R&D and EU Projects Department, REE, Spain)

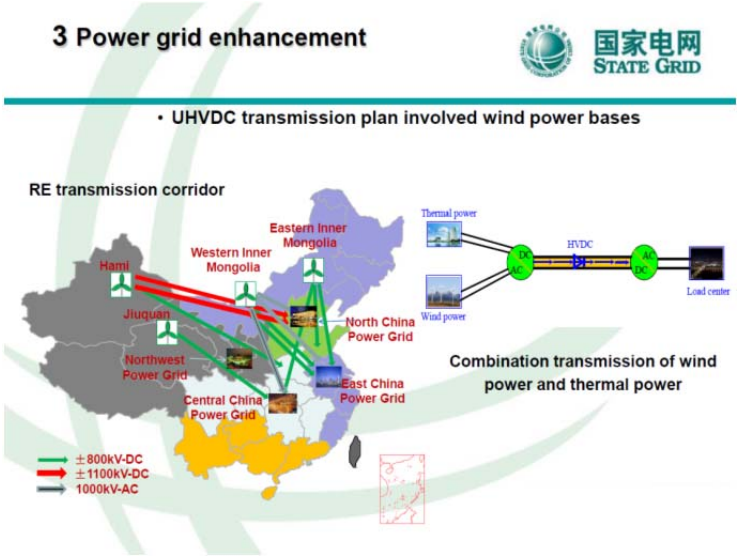


Fig.3

Renewable Energy Integration - Challenges and Practices

Dr. Luan Wenpeng,

Professor/Chief expert, Distribution Automation Department, CEPRI, China

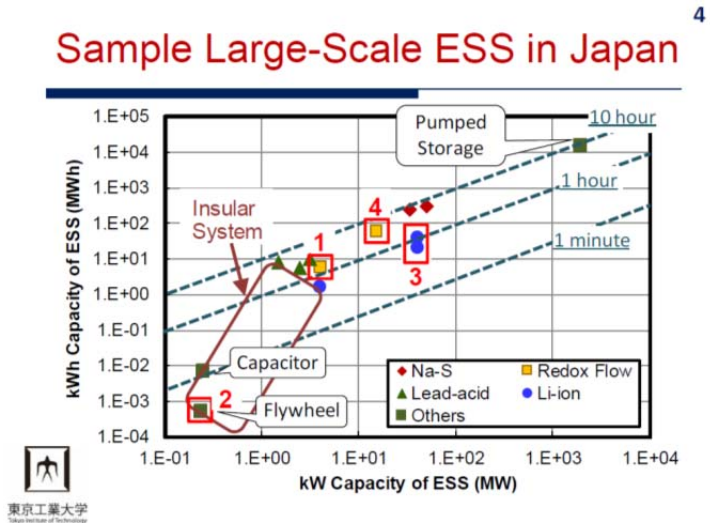


Fig. 4

Energy Storage to Mitigate the Impacts of Intermittent Renewables

Prof. Toshiya Nanahara, Professor, Department of Electrical and Electronic Engineering, School of Engineering, Tokyo Institute of Technology, Japan

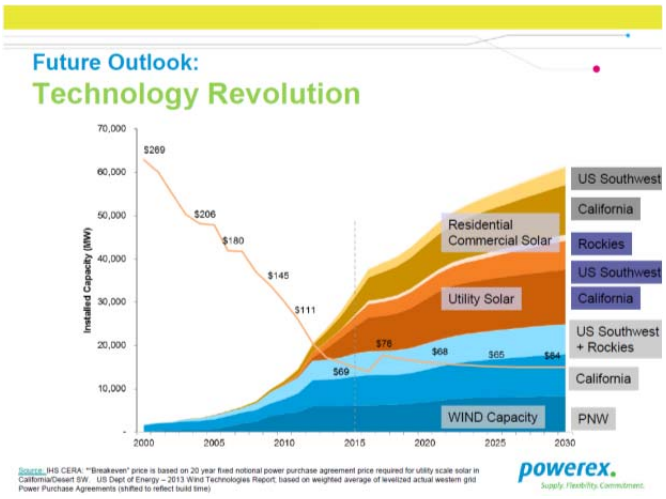


Fig.5

Large Hydro and the Growth of Renewable Energy in Western North America

Mr. Brian Moghadam (Business Development, Powerex Corp., Canada)

Also, the presentation of Mr. Greg Stanway (BC Hydro, Canada) & Dr. Vidya Vankayala (Powertech Labs Inc., Canada) can be viewed with animation from https://youtu.be/-MiE2cqEcng

1-2-4. Session 1: The value and benefits of energy storage

Chair person: Dr. Yao Liangzhong, Vice president, CEPRI, China

(Chair's comment at the Day 2 Panel (1-3-3). Edited by the IERE Central Office)

In session one, it's about the value and benefit of energy storage. There are five speakers from China, Spain, South Africa and Taiwan. All speakers agree that energy storage has important roles in power system. Particularly energy storage can help for reducing power curtailment and the instability of the power system, etc. However, there are still numbers of certain issues which we are facing such as cost issue; cost is really higher. The second is we need to hire large-capacity storage, not small-capacity. It is necessary to choose different types of storage from small-scale storage. The third issue is the safety and reliability issue. So there are lots of challenges we are still facing so lots of effort in the future.

S1-1 Energy Storage Technologies & Applications in Power Systems - Challenges and Experiences
Dr. Yao Liangzhong (Vice president, CEPRI, China)

S1-2 Battery Storage Advantages for Fast Charging Stations
Dr. Matthieu Loos (Engineer, Power Systems, Powertech Labs Inc., Canada)

S1-4 Stability FACTS + ESS for fast energy response in case of contingency
Mr. Vicente González (Head of Department, R&D and EU Projects Department, REE, Spain)

S1-5 Application of Cost-Effective Grid-Scale Battery Storage as an Enabler of Network Integration of Renewable Energy
Prof. Innocent Davidson
(Professor, Department of Electrical Power Engineering, Durban University, South Africa)

S1-6 Study of Using Energy Storage to Mitigate the Impact of High Renewable Energy Penetration to the Grid
Mr. Che-I Lin
(Electrical Engineer, Taiwan Power Research Institute, Taiwan)

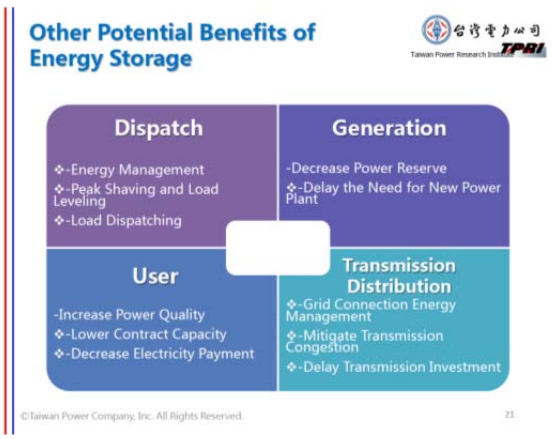


Fig.6
A Slide from Mr. Che-I Lin (TPRI, S1-6)

1-2-5. Session 2: Advances in energy storage and conversion technologies

Chair person: Dr. Lei Wang, Director of Power Systems, Powertech Labs Inc., Canada.

(Chair's comment at the Day 2 Panel (1-3-3). Edited by the IERE Central Office)

The session two title is 'advancing in energy storage and combustion technologies' and again also we have five presentations and they basically touch two themes of the subject. The first one is battery or storage technology so this is variety of things that has been discussed from methanol to zinc-air batteries to batteries of different high capacity in the batteries and I can see that subject that discussed are very interesting and you can see that these things started to make industry impact in some sense now. Second category or second theme is testing of the batteries and we see that testing is conducted on the industry grid from 20, 30 or 40 MW of battery to small ones, so they also show very interesting results and in terms of the capacities, lifetime spends and different kind of characteristics of those batteries. So in that sense, I think this conference really selected a very excellent subject on storage in batteries and so on and I think this is important trend in the industry and from this conference. We have already learned a lot from all this presentations on the current status and activities and achievements made.

S2-1 "The innogy Green Fuel Project" - linking the electricity and mobility sectors by power to methanol technology
Mr. Thorsten Miltkau
(Senior Manager Technologies, Corporate Technology, innogy SE, Germany)

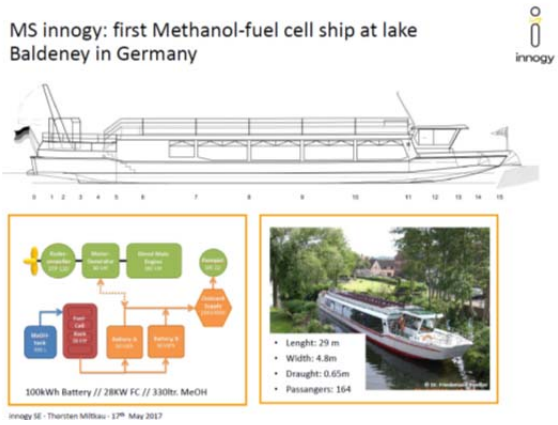


Fig.7

A Slide from Mr. Thorsten Miltkau (Innogy, S2-1)

S2-2 A Flow Battery for Long Duration Applications
Mr. John McLeod (Vice President Engineering, ZincNyx Energy Solutions Inc., Canada)

S2-4 R&D strategy and its related activities on advanced Li-ion batteries for electrical energy storage system
Dr. Sang-Min Lee (Principal Researcher, Battery Research Center, KERI, Korea)

S2-5 Recent status of the battery energy storage technologies in Japan and issues related with performance evaluation
Mr. Yuichi Mita (Senior research Scientist, CRIEPI, Japan)

S2-6 Research and Application of Fiber Bragg Grating Temperature Sensor for Energy Storage Battery In-situ Detection‘ Mr. Xu Chong
(Engineer, Energy Storage and Electrotechnics Department, CEPRI, China)

1-3. Day 2

1-3-1. Session 3: Contribution of EV and Storage for Power System

Chair person: Dr. John Wing Mao Cheng, CLPRI

(Chair's comment at the Day 2 Panel (1-3-3). Edited by the IERE Central Office)

My section is number three. It's basically advancements of T&D in the support of energy storage. Dr. Luan Wenpeng from China actually told us a lot of things about microgrid. Actually, I found all the speaker is progressively going into more grandeur topics so starting from microgrid, we move onto virtual power plant which is already bigger than micro gird and that is delivered by Mr. Asajima from Kansai Electric, so he shows us some of the experience and knowledge about how do they plan and actually execute virtual power plant. Then, we move to Korea, Dr. Cho (KEPCO) talked about utility scale, MW and MWh scale storage. I think there are not a lot of countries in the world that they can have implemented this level. And then we come back to China, Dr. Li Wei talked about very large grid, some of the issues. I think this is one of the most interesting discussions because all the power electronics coming into play in our industries right now particularly on the each distribution levels but also on the microgrid level. The inertia of what we are accustomed to know and deal with seems to be depleting, so this is a new challenge and then Dr. Hata from Japan talks about how the Japanese are simulating what we call the smart communities interacting with our traditional distribution systems. So I think simulations actually take us to a new level and then we can really recognize what all the smart or incidental things are affecting our traditional system. Dr. Jung from KEPCO Research Institute again talks about the ESS applications in rural area particularly how they interact with the system. He actually brings in the business side of things and how the restoration system and the restoration market is interacting with all the energy storage. The final presentation was by Mr. Chen from China ERPI and this is something everybody is looking at right now on the demand response and you can see that China has done a lot of work in terms of prepared not just in the standard but also a lot of trials that they are experiencing.

S3-1 Microgrids Technology Implementation and Standardization
Dr. Luan Wenpeng
(Professor/Chief expert, Distribution Automation Department, CEPRI)

S3-2 Evaluation of Li-ion Battery System and Demonstration Project of Virtual Power Plant
Mr. Ken Asajima
(Senior Research Engineer, Advanced Technology Laboratory - R&D Center, Kansai EPCO, Japan)

S3-3 Utility Scale Energy Storage Application and Development in Korea
Mr. SungMin Cho
(Senior Researcher, Energy New Business Lab., KEPCO, Korea)

Fig.8 A Slide from Mr. SungMin Cho (KEPCO, S3-3)

S3-4 Views on enhancing the consumption capacity of renewable energy resources
Dr. Li Wei (Director, Power system analysis and consulting division, NARI Group, China)

S3-5 Simulation Method to Evaluate Mutual Impact between Smart Community and Distribution System
Dr. Hiroyuki Hatta (Research Scientist, Energy Innovation Center, CRIEPI, Japan)

S3-6 Operation of ESS Interconnected to the Distribution Feeder by Distribution Management System
Mr. Wonwook Jung (Senior Researcher, KEPCO, Korea)

S3-7 Research Frontiers and Development Dynamics of Demand Response under Deregulated Electric Power Retail Market' Mr. Chen Songsong
(Engineer, Electric Usage and Energy Efficiency Research Department, CEPRI, China)

1-3-2. Session 4: Advances in technology in support of the 21st century power system

Chair person: Mr. Thorsten Miltkau, innogy SE

(Chair's comment at the Day 2 Panel (1-3-3). Edited by the IERE Central Office)

I chaired the last session here which was entitled 'advances in technology and support for the 21st century power systems'. My impression was there is a lot of going on in terms of improvement of operation and maintenance, so we heard something about the maintenance of doing operation, purifying and the online transformer, for example. We have something about modeling and forecasting and therefore optimizing operations. Third one was also in this content, load shifting and control processes for multiple battery systems. These are all very great enhancements of operations and maintenance and addressing of our new renewals battery system. What else? In terms of battery and storage, my impression is that the search for the right technology is accomplished so there is still the question which technology is first, which issue is best and I wonder if the hybrid solutions will be – we have a real step forward in meeting all the expectations and we have in the end some general advices for integration renewals and I am glad to hear that beside Germany, also other countries are really now dealing with these really big issues, how to integrate, how to manage, how to connect renewable energy sources to the existing grids. Germany is quite easy if you build, for example, an offshore wind power, the grid operator has to integrate, has to connect you to the grid by law so you don't have to care about this and if it doesn't happen on time, you will probably get money back, things like this. But this is not everywhere in the world the same case but it is the same issue behind it.

S4-1 On-Line Transformer Oil Purification
Dr. Mike Jain (Product Manager, Substation Services, Powertech Labs Inc., Canada)

S4-2 A Realistic Method of Forecasting Dam Water Inflow for an Efficient Operation of Hydroelectric Power Stations including Pumped Storage
Mr. Koichiro HATA
(Senior Researcher, Electric Power Research & Development Center, Chubu EPCO, Japan)

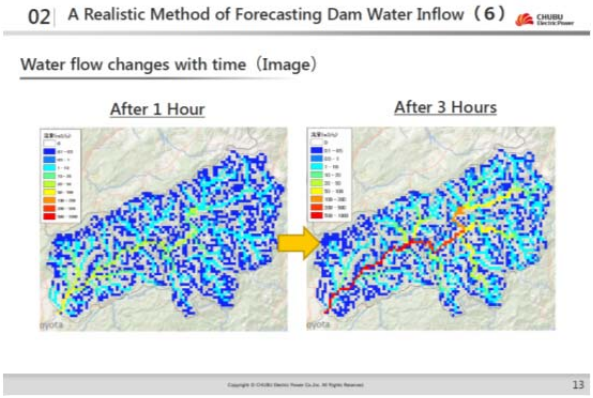


Fig.9 A Slide from Mr. Koichiro HATA (CEPCO, S4-2)

S4-4 Field operation of multiple BESSs for demand management of a large-scale electricity consumer
Dr. Seul-Ki Kim

(Principal Researcher, Executive Director of Advanced Power Grid Research, KERI, Korea)

S4-5 Recent trends on interconnection of power storage facilities to real systems in Japan and the United States
Dr. Joji Kawano
(Deputy Senior Research Associate, Research Department, Japan Electric Power Information Center(JEPIC), Japan)

S4-6 Study on Calculation Method of Carbon Emission in Utilization of ACCC Conductor in New or Modified Power Lines
Dr. Li Xin (Senior Researcher, Technology Center, NARI Group, China)

S4-7 Renewable Energy Zones in Queensland: A means to Integrate Transmission and Generation Infrastructure Development
Prof. Innocent Davidson
(Professor, Department of Electrical Power Engineering, Durban University, South Africa)

1-3-3 Panel discussion by session chairs (Plenary Conclude session)

Panel discussion was conducted by Chair of each session with the Moderator of Mr. Gregory Tosen, IERE Chair, on the various approaches as shown in the sessions

Moderator: Mr. Gregory Tosen, IERE Chair., South Africa
Panelists : Dr. Yao Liangzhong (Chair of Session 1)
Dr. Lei Wang (Chair of Session 2)
Dr. John Wing Mao Cheng (Chair of Session 3)
Mr. Thorsten Miltkau (Chair of Session 4)

In the panel discussion, the points and impressions of each session were mentioned, and then the following items were discussed.

- Compressed air storage
- Restriction on construction of power transmission system in Europe etc
- Power system traffic
- Development of batteries energy storage technology in Asia
- Climate change issues and impact on the power industry

1-3-4 Closing remarks

From Powertech Labs Inc. / Mr. Raymond Lings (CEO of Powertech labs Inc.)
From IERE central office / Dr. Takao Watanabe (IERE Central Office)

1-4 Day 3: Technical tour : Site visit of Powertech Labs Inc.

A technical tour of Powertech Lab Inc. was held on Friday, May 19, with 27 participants. Powertech Labs introduced in-house developed hydrogen and quick charging station, power equipment test facilities, power system analysis simulator, etc.

Note: Presentation files and snap photos of the 17th IERE General Meeting & Canada Forum can be downloaded on the IERE Website.
https://www.iere.jp/events/forum/archives/2017-canada.html

2. Announcement

2017 IERE-TNB Putrajaya Workshop

The electricity supply industry has been facing many challenges worldwide. The issues include challenges to produce, transmit, and use energy in an environmentally acceptable and sustainable manner. At the same time, the electricity supply industry needs to reduce its costs by improving operating efficiency and business practices with digital world becoming the forefront tools in reshaping the operating model in the future. In addition, the industry also needs to ensure customer satisfaction beyond the traditional supply reliability and power quality. Hence, research and development on new and enabling technologies plays a major role in shaping the future directions of electricity supply industry.

“Technologies reshaping the electricity supply industry”
November 20 (Monday) – November 23 (Thursday) 2017, Putrajaya, Malaysia
Organized by TNB Research and IERE

Registration Deadline: October 23, 2017

Please refer to the following URL;
https://www.iere.jp/events/workshop/2017-malaysia/index.html

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