

ELECTRICITY SECURITY ADVISORY PANEL (ESAP)

Expert Workshop VIII

NEW POLICIES FOR ENSURING ELECTRICITY SECURITY

Friday, 15 June 2018

2-1-1 Uchisaiwaicho, Chiyoda-ku, Iino Hall & Conference Center, Tokyo 100-0011, JAPAN

Since 2014, the IEA has organized seven Electricity Security Advisory Panel (ESAP) expert workshops. These workshops were primarily organized around topics to be included in IEA publications, most notably Re-powering Markets, which was launched in 2016.

Following the November 2017 ministerial meeting, the IEA has been given a mandate by Ministers to explore a new role on electricity security, in particular, focusing on the areas of distributed energy resources, geographic integration of power systems, dispatchable generation, storage, demand-side measures, and system integration of renewables. Based on the success of the previous ESAP workshops and this renewed and expanded mandate, in 2018 the IEA will launch the Electricity Security Action Plan 2.0.

Electricity Security Action Plan 2.0

In developing the Electricity Security Action Plan 2.0, the IEA has identified three main areas of concern about electricity security:

- i) **Implementation of new mechanisms in established markets** to ensure electricity security in the face of retiring dispatchable generation;
- ii) **Development of security mechanisms in new markets**, i.e. countries that are going through or have recently completed electricity market restructuring; and
- iii) **Addressing security concerns in non-market based systems**

The Electricity Security Action Plan 2.0 will both take a deeper look at the policies, regulations and market mechanisms necessary to ensure electricity security in a decarbonizing world. This will include examining the security implications of relying on high shares of variable renewable generation, and the interaction between power system and natural gas markets.

This workshop will explore the technological and economic challenges of different pathways to 2050 decarbonisation. In short, what combination of technologies can meet decarbonisation objectives at the least cost? In addressing this question, the workshop will seek insights from regulators, system operators, industry and academia in various OECD/non-OECD countries facing similar issues regarding electricity sector decarbonisation.

The workshop will focus on the following areas:

- **Ensuring electricity security: policy, regulation and markets**
- **The role of nuclear power**
- **Grid resilience: defining and enabling**
- **Increasing power system flexibility**

The meeting will be informal in nature and held under Chatham House Rule.

Attendance is by invitation only.

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08:30 – 09:00	Registration and tea/coffee
09:00 – 09:30	Opening remarks <ul style="list-style-type: none">● Keisuke SADAMORI ♦ Director of Energy Markets and Security, IEA
SESSION 1	ENSURING ELECTRICITY SECURITY: POLICY, REGULATION, AND MARKETS
09:30 – 10:45	<p>Power system transformation is occurring around the world at a more rapid pace than previously anticipated. Renewable additions are accelerating, forcing governments and system operators to deal with the reality of a higher renewables world. Electricity demand growth in OECD economies is flat or even declining. And, in many markets, existing resources are facing pressure to exit. These and other changes are affecting the design and operation of electricity markets and creating challenges for electricity security. This session will focus on the roles policy, regulation and market design play in ensuring sufficient investment in and the secure operation of power systems.</p> <p><i>Followed by roundtable discussion</i></p> <p>Moderator: Alejandro HERNANDEZ ♦ Senior Electricity Analyst, IEA</p> <p>Panellists:</p> <ul style="list-style-type: none">● Japan's market reform: developing new market mechanisms Manabu NABESHIMA ♦ Director, Office for Electricity Supply, Demand, Transmission and Distribution Policy, METI● Market trends from the US DOE grid study Eric HSIEH ♦ Director, Energy Finance and Incentives Analysis, US Department of Energy● Overview of Korea's electricity policy Jaekyun AHN ♦ Associate Research fellow, Korean Energy Economics Institute
10:45 – 11:15	Tea/Coffee Break
SESSION 2	THE ROLE OF NUCLEAR POWER
11:15 – 12:30	<p>Nuclear power remains an important part of the global energy landscape, supplying 11 percent of the world's electricity and making up 20 percent of electricity capacity in OECD economies. It also remains a significant source of zero-carbon generation and has played a key role in enabling electricity security of supply by, for example, increasing net energy self-sufficiency in many countries. Construction of new nuclear plants in advanced economies, however, remains limited, and the existing nuclear fleet is aging. This session will look at the role of nuclear power in the power systems of today and those of tomorrow.</p> <p><i>Followed by roundtable discussion</i></p> <p>Moderator: Jan Horst KEPPLER ♦ Senior Advisor, OECD NEA</p> <p>Panellists:</p> <ul style="list-style-type: none">● The future of nuclear power in Japan Shinjiro TAKEDA ♦ Director, Office for International Nuclear Energy Cooperation, METI● Nuclear power projections from APEC's demand and supply outlook Gigih Udi ATMO ♦ Senior Researcher, Asia Pacific Energy Research Centre (APEREC)● Nuclear power in China Chi Cheung TANG ♦ Senior Director – Nuclear, CLP Holdings Company Limited



Keisuke SADAMORI
Energy Markets and Security Director
International Energy Agency, Paris

Keisuke Sadamori became the IEA Director for Energy Markets and Security in 2012, leading an administrative structure that includes several core functions of the IEA, including monitoring global oil markets and responding to energy-supply disruptions.

Prior to joining the IEA, Mr. Sadamori, a Japanese national, held many senior positions at the Japanese Ministry of Economy, Trade and Industry (METI), including Deputy Director-General at the Minister's Secretariat.

Mr. Sadamori served as the executive assistant to the Prime Minister in 2011, when the Great East Japan Earthquake and Tsunami hit Japan, causing the Fukushima nuclear plant accident. Before this, he worked on international energy affairs and was the representative of the Government of Japan in such forums as the IEA Governing Board in 2008 and 2009. He also served as the chief negotiator for trade and investment agreements with Asian countries in 2009 and 2010.

Mr. Sadamori received an LL.B. from the University of Tokyo in 1983 and a Master's in Public Affairs from the Woodrow Wilson School of Public and International Affairs at Princeton University in 1990.



César Alejandro HERNANDEZ ALVA
Senior Electricity Analyst, International Energy Agency

César Alejandro Hernández Alva is a former Deputy Director-General for Competition Studies, on the Federal Economic Competition Commission of Mexico from 2007 to 2011. He also served as Advisor to the Undersecretary of Finance and Public Credit, where he collaborated in energy and green growth issues.

He currently participates in the design and implementation of the Electric Sector Reform and works on the key elements in the negotiation of the Energy Transition Law. Mr. Hernández Alva holds a BA in Economics from the Mexico Autonomous Institute of Technology and a MA and a PhD in Economics from the University of Toulouse in France.



Manabu NABESHIMA
Director for Electricity Supply Policy
Electricity and Gas Industry Department
Agency for Natural Resources and Energy

Manabu Nabeshima is Director for Electricity Supply Policy at Agency for Natural Resources and Energy (ANRE). As Director, he is responsible for designing Japan's new electricity markets including capacity market, balancing market, base-load market, and non-fossil fuel certificate market. Before taking his current position in 2017, he had experience in electricity policy as deputy director for 6 years. He joined Ministry of Economy, Trade and Industry (METI) in 2001. He received Master in Public Policy from University of California, Berkeley, and Bachelor of Laws from the University of Tokyo.



Eric HSIEH

Director for Energy Finance and Incentives Analysis, Office of Policy, U.S. Department of Energy

Eric Hsieh is the Director for Energy Finance and Incentives Analysis within the Office of Policy at the U.S. Department of Energy. His team provides market, economic, and financial analysis of policies and programs to meet national energy goals. Eric was previously the Director of Business Development at Nexans and the Director of Market Development at A123 Systems. He has also held positions at the National Electrical Manufacturers Association and the Federal Energy Regulatory Commission (FERC). Eric received a Master in Public Policy from UC Berkeley and a B.S. in Computer Science and Engineering from MIT.



Jaekyun AHN

**Associate Research Fellow
Korea Energy Economics Institute**

Dr. Jaekyun AHN is an associate research fellow at Korea Energy Economics Institute where he is on the Electricity Policy Research Division. Dr. AHN has been working with electricity policy and market issues since he joined the institute in 2014. His current topics are market design for power system flexibility and optimal power generation mix.

Dr. AHN published an article in Energy Economics. His main research papers are the economic feasibility of ESS, cost-effective ways for achieving the power sector's GHG emission reduction target, Transmission tariff design, and power system flexibility.



Jan Horst KEPLER

Senior Economic Advisor, OECD, Nuclear Energy Agency

Jan Horst Kepler is senior economic advisor at the OECD Nuclear Energy Agency. He is also professor of economics at the Université Paris – Dauphine, where he directs the Chair European Electricity Markets (CEEM). His principle research is on the competitiveness of low carbon technologies such as nuclear energy and renewables, taking into account their full costs at the system level. Recent publications include The Full Costs of Electricity Provision (2018), “Determining Optimal Interconnection Capacity on the Basis of Hourly Demand and Supply Functions of Electricity” (Energy Journal, 2018), “Rationales for Capacity Remuneration Mechanisms” (Energy Policy, 2017) as well as Nuclear Energy and Renewables: System Effects in Decarbonising Energy Systems (2012). Current work centres on the optimal provision of flexibility and dispatchable power generation in decarbonising electricity systems. Professor Kepler intervenes regularly in the media and was until 2018 a member of the Exchange Council of EPEX Spot, the European electricity market operator.



Shinjiro TAKEDA

Director of Office for International Nuclear Energy Cooperation and Office for Nuclear Technology and Human Resources, Agency for Natural Resources and Energy, Ministry of Economy, Trade and Industry (METI)

Professional Experience:

2017.6- Director, Office for International Nuclear Energy Cooperation, Office for Nuclear Technology and Human Resources, Nuclear Industry Office, Agency for Natural Resources and Energy
2016.7- Director, Office for Nuclear Technology, Safety and Human Resources, Agency for Natural Resources and Energy
2014-2016 Deputy Director, Policy Planning and Coordination Division, Minister's Secretariat

2012-2014 Deputy Director, Nuclear Energy Policy Division, Agency for Natural Resources and Energy
2011-2012 Deputy Director, Nuclear Emergency Response Headquarters for Fukushima Accident
2000.4 Joined the Ministry of International Trade and Industry (MITI)

Academic Background:

1996-2000 Faculty of Law, the University of Tokyo; 2005-2006 L.L.M, School of Law, Duke University; 2006-2007 MBA, SAID Business School, the University of Oxford



Gigih Udi ATMO
Senior Researcher, Asia Pacific Energy Research Centre (APERC)

Gigih Udi Atmo joined APERC as a Visiting Researcher in May 2017. He is on a secondment from his employer, Ministry of Energy and Mineral Resources (MEMR) of Indonesia. His research interests include infrastructure finance, public-private partnerships, regional electricity grid integration, power system operation and reliability. His research has been published in international journals, including International Journal of Public Sector Management, Built Environment Project and Asset Management, and a book chapter published by Cambridge Scholars Publishing. His Ph.D. research at University of Melbourne, Australia focused on Project financing and power generation projects in Asia.

Upon returning from his PhD study in 2015, Gigih assisted MEMR to draft regulations on commercial terms for parallel operations of privately-owned power generations, principles of power purchase agreements of Independent Power Producers (IPPs), and on-grid solar PV interconnections. He led forty-two electrical inspectors to produce a report on thermal efficiency and safety performance of twenty-eight coal-fired power plants in Indonesia. The report was used by the Ministry to prepare a draft regulation on improving thermal efficiency of Indonesian power plants. The report was also adopted by the state utility company (PLN) to improve safety operations on low-rank coal-fired power plants in Indonesia.

In 2005, Gigih was appointed by MEMR to join the National Task Force for Electricity Blackout Investigation where he collectively worked together with university professors from three leading universities in Indonesia and senior engineers of power generation companies to submit a report to the Minister. This report contained an investigation on the root-cause of electricity blackout in Java-Bali grid that occurred on the 18th of August 2005.

Gigih began his professional career in 2001 as a control and protection engineer at ALSTOM Transmission in Indonesia, where he was responsible for developing electrical protection system of 500 kV and 220 kV substation projects in Indonesia and Viet Nam, respectively. He was involved in the development of computerised energy management system in Alstom System Automation in Paris and SAINCO SCADA centre in Seville. He applied Electrical Power System Analysis (ETAP) software to analyse power system of the Total Tunu-8 onshore oil & gas project in Indonesia.

Gigih holds Bachelor's degree of electrical engineering from University of Gadjah Mada, Indonesia, a Master of Engineering Project Management from the University of Melbourne, Australia and a Ph.D. in Infrastructure Engineering from the University of Melbourne. He received scholarships of Australian Leadership Awards and MEMR scholarship for his master and Ph.D. study, respectively.



Chi Cheung TANG
Senior Director - Nuclear

Mr. Tang is responsible for CLP Group's nuclear business. He served at Daya Bay Nuclear Power Station in various managerial positions spanning over 20 years. He has also involved in Group Internal Audit function and China business. Mr. Tang is a Chartered Accountant trained at Price Waterhouse in Australia. Before that, he was with the State Energy Commission of Western Australia. AHKICPA, ACA (Aust), MBA, BBA (Hons), LLB.



Matthew WITTENSTEIN
Senior Electricity Analyst
International Energy Agency (IEA)

Matthew Wittenstein joined the International Energy Agency's Gas, Coal and Power Markets Division in 2014. As a senior electricity analyst, he focuses on the economics of generation, the challenges of encouraging investment in clean energy technologies, and electricity market design. He was a lead co-author of the 2015 Projected Costs of Generating Electricity study, the Development Prospects of the ASEAN Power Sector report, and the IEA's 2016 Thailand Electricity Security Assessment. Mr. Wittenstein is currently leading the IEA's work on cross-border electricity security.

Prior to joining the IEA, Mr. Wittenstein was a Fellow in the US Department of Energy's International Climate Change Office, where he supported the Clean Energy Ministerial, a global forum dedicated to sharing best practices and promoting policies and programs that encourage and facilitate the transition to a global clean energy economy. In his role, Mr. Wittenstein chaired the incentives working group of the Super-efficient Equipment and Appliance Deployment (SEAD) initiative, and managed the 21st Century Power Partnership, a platform for public-private collaboration to advance integrated policy, regulatory, financial, and technical solutions for the large-scale deployment of renewable energy and energy efficiency, as well as smart-grid technologies. Mr. Wittenstein holds a Masters of International Affairs from Columbia University, with a concentration in international economic policy.



Craig GLAZER
Vice President, Federal Government Policy for PJM Interconnection

Craig Glazer serves as the Vice President – Federal Government Policy for PJM Interconnection. In this capacity, Mr. Glazer coordinates all of PJM's regulatory and legislative policies before Congress, the Federal Energy Regulatory Commission, the United States Department of Energy and other federal agencies. PJM operates the largest competitive wholesale electricity market in the world and serves over 9% of the United States population. Mr. Glazer heads PJM's Washington, D.C. office.

Mr. Glazer is a graduate of the University of Pennsylvania and the Vanderbilt University School of Law.

PJM Interconnection ensures the reliability of the high-voltage electric power system serving 51 million people in all or parts of Delaware, Indiana, Illinois, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia and the District of Columbia. PJM coordinates and directs the operation of the region's transmission grid, which includes 6,038 substations and 56,070 miles of transmission lines; administers the world's largest competitive wholesale electricity market; and plans regional transmission expansion improvements to maintain grid reliability and relieve congestion. Visit PJM at www.pjm.com.

Prior to coming to PJM, Mr. Glazer served as Commissioner and Chairman of the Public Utilities Commission of Ohio. As one of the longest-serving Chairs of the Ohio Commission in its history, Mr. Glazer oversaw Ohio's move toward deregulation of its telephone, natural gas, transportation and electric industries. Mr. Glazer served as CEO of the agency which operated with over 300 employees and a budget of \$25 million. He also chaired the state's Siting Board and served as a member of the Governor's Cabinet.

Mr. Glazer remains extremely active on national electricity issues. He frequently testified before Congress and the Federal Energy Regulatory Commission on development of Regional Transmission Organizations and the needs of the marketplace. Mr. Glazer served as a member of the Board of Directors of the National Association of Regulatory Utility Commissioners, Chairman of its International Relations Committee and a member of its Electricity and Energy Resources Committees. He also chaired the National Council on Competition in the Electric Industry, an interagency collaborative which brought together FERC, the state PUCs, the US Department of Energy, the US EPA and the National Council of State Legislatures. He has served as Chairman of the Board of Directors of the Northeast Midwest Institute, a bipartisan research arm of the Northeast and Midwest region's Congressional delegations and on the Board of Directors of the Gridwise Alliance.



Amro M. FARID

Associate Professor of Engineering, Thayer School of Engineering at Dartmouth

Prof. Amro M. Farid is currently an Associate Professor of Engineering at the Thayer School of Engineering at Dartmouth and Adjunct Associate Professor of computer science at the Department of Computer Science. He leads the Laboratory for Intelligent Integrated Networks of Engineering Systems (LIINES). The laboratory maintains an active research program in

- Smart Power Grids
- Energy-Water Nexus
- Energy-Transportation Nexus
- Industrial Energy Management & Demand Response
- Integrated Smart City Infrastructures

He received his Sc. B. in 2000 and his Sc. M. 2002 from the MIT Mechanical Engineering Department. He went onto complete his Ph.D. degree at the Institute for Manufacturing within the University of Cambridge (UK) Engineering Department in 2007. He has varied industrial experiences from the automotive, semiconductor, defence, chemical, and manufacturing sectors. In 2010, he began his academic career as a visiting scholar at the MIT Technology Development Program.

He is also a Research Affiliate at the MIT Mechanical Engineering Department and the U. of Massachusetts Transportation Research Center. He has made active contributions to the MIT-Masdar Institute Collaborative Initiative, the MIT Future of the Electricity Grid Study, and the IEEE Vision for Smart Grid Controls. He currently serves on the Executive Committee for the Council of Engineering Systems Universities (CESUN). He is a senior member of the IEEE and holds leadership positions in the IEEE Control Systems Society (CSS) Technical Committee on Smart Grids, and the IEEE Systems, Man & Cybernetics (SMC) Technical Committee on Intelligent Industrial Systems. He is also a member of the IEEE SMC Technical Committee on Distributed Intelligent Systems, the IEEE Industrial Electronics Society Technical Committee on Industrial Agents, and the ASME Dynamics Systems & Control Division.



Jong-Bae PARK

Professor, Konkuk University, South Korea

Dr. Jong Bae Park, Ph.D., is a professor of Konkuk University (South Korea) in Electrical Engineering Department and has built nearly 30 years of experiences in electric power industry and academia. His experiences include national energy and power system planning from a planner in the government-owned electric utility to national committee members for more than 15 years. Also, he actively has participated in national smart grid initiatives of South Korea from 2005 as a member of government steering committees. From 2017, he is a chairman of national smart grid committee. He expertizes the electricity market design and analysis where he

has played an important role in energy, capacity, and ancillary market design of South Korea and their evolutions since 2001. Also, his research area covers the optimization of combined heat-and-power systems and has developed the optimal operation software for commercial usage. He has published more than 100 papers in international and domestic journals. He was the representative of Korea in IEC/SEG6 for international micro-grid standardization during 2014-2016. He is a member of Electric Policy Committee in Korea since 2016 and a member of National Energy Supply and Demand Committee from 2018.



Kiyoshi NISHIMURA
General Manager, Kansai Electric Power

Specially Appointed Professor
Business Engineering, Osaka University
1984 Economics Hitotsubashi University
1999 Distinguished Visiting Professor, Economics, Gakushuin University
2011 General Manager, Marketing, Advanced Technology, Smart Community
2014~ Member of DR studying Committee, METI



Gregor PETT
Executive Vice President Market Analytics/Market Solutions
Uniper

Gregor Pett has over 24 years of experience (more than 16 years in executive positions) in the energy industry.

In 2017 Gregor Pett was announced as Executive Vice President Market Analytics/Market Solutions at Uniper. In his role, he is responsible for Global cross commodity market analytics and Uniper's third party market solutions and portfolio management business.

Prior to taking up his role at Uniper, Gregor spent almost two decades working for E.ON and Ruhrgas. From 1994 until 2008 he had various roles within the gas business of E.ON Ruhrgas including technical planning, gas supply negotiations, gas portfolio planning, risk management and optimization. In 2008 he became Senior Vice President at E.ON SE and was in charge of commodity risk management and steering of commercial operations across the group – gas and power in particular. He joined E.ON Global Commodities in 2014 (which became Uniper Global Commodities SE in 2016) as Director Market Operations.

Over this period he has also served on a number of Supervisory Boards including E.ON Global Commodities (Düsseldorf), E.ON France (Paris) and E.ON Energie (Munich).

Mr Pett had the chair of the Energy Trading Steering Committee in German Energy Industry Association BDEW, Berlin, for many years and was a member of the BDEW Market Design and Gas Market Design Project Groups advising German policy makers on market design issues. Currently he is a member of the Energy Business Council of the International Energy Agency (IEA), Paris and a regular peer reviewer of IEA publications.

Mr. Gregor Pett completed University-in 1994 with a degree in Physics.



Ulrik STRIDBÆK
Senior Director, Regulator Affairs, Ørsted A/S

Ulrik Stridbæk, Senior Director at Ørsted is the Head of Regulatory Affairs. He is responsible for managing Ørsted's stakeholder engagement on regulatory and policy issues. He has worked at Ørsted for 9 years.

Before joining Ørsted he was a senior policy advisor at the International Energy Agency, where he was responsible for electricity sector analysis, giving policy advice to member governments. He worked at the IEA for 4 years.

Mr. Stridbæk has worked in the energy sector on energy sector analysis, regulation and policy for 20 years. He holds a Master's degree in Economics.



Sumie NAKAYAMA

Senior Advisor on Climate Change

Corporate Planning and Administration Department / Thermal Power Department
J-POWER

Sumie Nakayama is in charge of research and analysis of energy and climate policy, climate science and energy trend for designing corporate strategy on carbon risk management. She has expertise in model based energy/power demand/supply analysis, research and development of low carbon technologies including CCS through her career working for J-POWER including the work as a visiting researcher of Center for Energy and Environment Policy Research, Massachusetts Institute of Technology for two years.

She holds a Bachelor of Science in applied physics from Tokyo Institute of Technology and Master of Engineering in energy science from Graduate School of Tokyo Institute of Technology.



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