



# **The Challenges of Power Utilities in Implementing Digitalization in the Era of Industry 4.0**

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**Panel Discussion in National Electricity Day Conference  
Jakarta, 9 September 2019**

# What is CIGRE?

## CIGRE

Conseil International des Grands Réseaux Électriques  
International Council On Large Electric Systems



- Founded in Paris in 1921 as a **worldwide non-profit association**.
- CIGRE addresses **issues** related to the development, operation and management of electric power systems as well as design, construction, maintenance and disposal of equipment and plants.
- 59 National Committees, over 14000 members in more than 90 countries
- Facilitate and develop the exchange of power system-related engineering knowledge and information.
- Add value by sharing ideas and information, synthesizing state-of-the-art and world practice
- Produce and deliver unbiased high-quality technical information in support of society's need.

# What Is The Industry 4.0 Definition and Reference?

- The term industry 4.0 refers to a further developmental stage in the organization and management of the entire value chain process involved in **manufacturing industry**. Another term for this process is the 'fourth industrial revolution' : On the basis of cyber-physical production systems [CPPS], merging of real and virtual worlds. [*Deloitte: [www2.deloitte.com](http://www2.deloitte.com)*]
- The term "Industry 4.0", shortened to I4.0 or simply I4, originated in 2011 from a project in the high-tech strategy of the German government, which **promotes the computerization of manufacturing**. The term "Industry 4.0" was publicly introduced in the same year at the Hannover Fair. In October 2012 the Working Group on Industry 4.0 presented a set of Industry 4.0 implementation recommendations to the German federal government. [*en.wikipedia.org*]

# What Is Industry 4.0 Term In Power System?

- Application of Industry 4.0 is initially recommended for manufacturing industry. The question is producing electricity a manufacturing industry? Not really.
- But, using the terminology defined by German Working Group on Industry 4.0, the implementation of industry 4.0 in power system can be defined as computerization of the process of electricity supply from upstream to downstream.
- And observing the recent development, and be more specific: Industry 4.0 in power system refer to digitalization of electricity production and consumption process.

# How Digitalization Will Affect the Power System?

- In my view the digitalization in power system will not make significant change on how the electricity is produced, transmitted, distributed and consumed.
- Digitalization will make changes and improvements in the quality and efficiency of the production, transmission, distribution and consumption of electricity.

# The Opportunity of Application of Digitalization in Power System

- System Planning can be improved by a kind of Smart System Planning. This will result in a more accurate and high quality of decision in power system expansion program .
- Computerization and Internet of Every Thing in EPC [Engineering, Procurement and Construction Management]. A kind of Artificial Intelligent is being created to function like “Smart Consultant”
- Digitalization in Power Generation will create efficiency through asset management, logistic management and the efficient operation of the power plants.
- Implementation of Smart Grid, will improve reliability and quality of electricity supply and will result in more efficient and economical electricity production and consumption.

# The Challenges of Power Utility in Implementing Digitalization

- Digitalization in Power System is pioneered by developed nations in their power industries and power equipment products. The utility in developing country should conduct a feasibility study before its implementation.
- The implementation of digitalization will not be similar and neither be common solution to all utilities. Its implementation in a utility will require customization.
- Implementation of digitalization in Power System will deal with large volume of data. Data accuracy and management will be key factor for successful implementation of digitalization.
- Smart solutions can only be well designed and implemented by smart people and smart organization. Utility should ensure they have both before implementing digitalization.

# To Close

- Digitalization is an opportunity for power utility to improve its power quality, reliability and efficiency. Digitalization in regulated power system is not a business disruptive.
- The challenges of digitalization in power systems are: initial feasibility study; preparing smart people and smart organization; customization of smart solutions application; and development and managing and analyzing of big data.



# Biography of Herman Darnel Ibrahim

**Chairman of CIGRE [International Council of Large Electric Systems] Indonesian National Committee**



**Born in 1954. He is a Member of House of Regional Representative [Senator] and was Board Member of DEN, the National Energy Council of Indonesia 2009-2014 and Former Director of PLN the State Electricity Corporation [2003-2008]. Beside he serves as Freelance Consultant, Chair of ICEES [Indonesian Counterpart for Energy and Environmental Solutions], a GLG Group Council Member, a Lecturer at Faculty of Engineering of University Indonesia, and Advisor in energy companies.**

He also serves as Member of Board of Supervisors of Indonesian Renewable Energy Society [IRES], Vice Chair of Expert Board of Indonesian Energy Conservation and Energy Efficiency Society [MASKEEI], Member of Expert Board of Indonesian Power Society [MKI], Advisory Board Member of Indonesia Geothermal Association [INAGA], and Indonesia Ocean Energy Association [INOCEAN]. **He is also active in International Organization, as *Chairman of Indonesian National Committee of CIGRE [International Council of Large Electric Systems] since 2006, and as Vice President IGA, International Geothermal Association [2013-2016].***

**Herman got his First Degree in Electrical Engineering from Bandung Institute of Technology [ITB]; M.Sc. Degree in Electrical Power System Analysis from the University of Manchester, UK; and Doctor Degree in Technical Science from ITB Bandung with research topic the Energy Policy for Power System Development.** For 30 years until 2008, he worked with PLN, the State Electricity Corporation of Indonesia. He achieved senior management position at the company as Director Transmission and Distribution [2003-2008], Director of PT. Indonesia Power, a subsidiary of PLN [1998-2003].

He wrote several papers, public media articles and a book titled *Energi Selamatkan Negeri [Energy to Safe the Country]*. In the past decade he contributed as the Speaker and Panelist at several national and international energy conferences.



**Terima Kasih**  
**Thank You**