

Next Generation Network (NGN) and Women in Energy (WiE) Mentorship Program Webinar



Transmission Grid Technical Requirements, Skills, Career Opportunities by 2050

Summary

By 2050 the USA grid needs have to have 3 times the capacity of the existing interconnected grid of 1.3 TW. It is expected that load growth due to data centers and large-scale electrification of transportation and industry will require a 3-4 TW interconnected grid. Generation will transition to mostly renewables and nuclear, relatively far away from the load centers. Energy storage (hydro, hydrogen and battery energy storage) will need to grow at a very fast rate for active balancing of generation and active loads. Furthermore, high offshore wind potential on the east-, west coast as well as the Big Lakes, offshore transmission will be required. Because so much of this new transmission must utilize existing infrastructure on land and submarine or underground cables offshore, HVDC technologies in multi-terminal DC grids are of high interest. This presentation will address the transmission design requirements, focusing on HVDC backbone and Macro-Grid topologies, converter technologies, protection, the need for skill development, long-term career options that include the possible use of AI and Machine Learning to plan and operate this integrated T&D (Hybrid AC&DC), grid of the future.

Speaker

Dr. Johan Enslin is currently serving as a Program Director for the Advanced Research Projects Agency-Energy (ARPA-E) at the US Department of Energy (DOE). His main research and development focus is to decarbonize electric power generation, transmission, distribution and active loads. He uses power electronics and sustainable energy resources to fulfill this quest. Johan is from Clemson University as Professor of Electrical and Computer Engineering and was the Duke Energy Endowed Chair in Smart Grid Technology, leading the large Power Center in Charleston SC. Dr. Enslin combines a balanced industry and academic career with more than 44 years of leadership experience in industry, academia and government throughout the USA, Europe and South Africa. He has served as a C-suite executive for several private business operations and a full-professor in electrical engineering at several universities. Dr. Enslin received BS, MS, and PhD degrees in Electrical and Electronic Engineering from the Rand Afrikaans University (RAU), South Africa, in 1981, 1983 and 1988 respectively. He has authored more than 350 technical papers, several book chapters and holds 25 patents. Johan has served in the IEEE Power Electronics (PELS), as well as Power and Energy Engineering (PES) Societies and CIGRE Working Groups for decades and is currently the President-elect (2025-2026) for PELS. He is a Fellow of the IEEE.

Links & Information

Thursday, August 29, 2024
12 pm CDT | 1 pm EDT

Duration: 1 hour

[Register Here](#)



Dr. Johan H.R. Enslin

Program Director

*Advanced Research Projects
Agency-Energy (ARPA-E) at
the US Department of
Energy (DOE)*