POWER ENGINEERING COMPETENCY FRAMEWORK FOR POWER ENGINEERING PROFESSIONALS IN PUBLIC SERVICE
TECHNICAL SKILLS AND COMPETENCIES (TSC) REFERENCE DOCUMENT

TSC Category	Decarbonisation					
TSC Title	Renewable Energy Technologies Application					
TSC Description	Apply relevant renewable energy technologies for the production of clean energy with a good understanding of the technical, economic and sustainability issues					
TSC Proficiency Description	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**	**Level 6**
				<Insert TSC Code>	**<Insert TSC Code>**	**<Insert TSC Code>**
				Apply knowledge of power engineering in tender specification, project management and maintenance of renewable energy technologies	Evaluate and select renewable energy technologies for projects taking into consideration technical, safety, economic and operational issues	Establish procedures and performance standards on renewable energy technologies, with a holistic long-term overview of Singapore's energy policy and power infrastructure
Knowledge				• Types of renewable energy sources • Harnessing from applications such as Solar, Wind, Water and Geothermal Energy • Principles of the renewable energy systems – solar water heating, Photovoltaic systems, wind turbine systems, Co-Gen and Trigen systems • Benefits and limitations of renewable energy systems • Principles and functions of renewable energy systems • Maintenance programmes for renewable energy systems	• Background and nature of clean energy harvesting and production • Energy conversion processes and sub-systems • Power electronic converters and energy storage sub-systems for clean energy • System-level design and assessment • Grid integration of renewable energy sources • Operations and maintenance of renewable energy systems	• Design of clean energy systems and yield estimation • Applications and market development of renewable energy sources • Grid integration of renewable energy sources • Operations and maintenance of renewable energy systems

Abilities				• Select appropriate types of renewable energy to be integrated into the building • Appraise the benefits and limitations of the renewable energy systems • Evaluate the efficiency of renewable energy systems • Appraise the principles and functions of renewable energy systems • Propose appropriate renewable energy systems • Select maintenance programmes for such renewable energy systems	• Explain the principle functioning of each technology • Identify appropriate renewable energy applicable and undertake system design • Understand the operational aspect of renewable energy generations • Describe how electricity sources can be integrated into the grid • Identify issues pertaining to grid integration	• Assess commercial viability of existing renewable energy technologies to replace conventional technologies or create a hybrid system • Review system design • Devise strategies to enhance the use or renewable energy sources for future demand • Review the different systems, their components, how they are designed and how they work • Analyse the renewable energy markets and latest market trends