

# Embedding Green Energy in Malaysia's Parliament as a Regional Model for National Institutional Decarbonisation

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**ABSTRACT** – As the green energy has risen as national concerns, the deployment of a total 1.5 MW grid-connected solar photovoltaic (PV) system at Malaysia's Parliament building marks of milestone integration of renewable energy within national governance infrastructure, reinforcing the government's role as both policymaker and practitioner in climate leadership. Strategically installed across rooftops, car parks, and open zones within the parliamentary complex, the system integrates high-efficient monocrystalline and glass-to-glass PV modules, smart string inverters, and advanced real-time energy monitoring infrastructure, in order to enhance on-site energy resilience, reduce peak demand loads, and support long-term operational efficiency. Hence, the system was successfully generated approximately 1.4 GWh of clean electricity annually, equivalent to a specific yield of 933 kWh/kWp/year under Malaysia's average solar irradiance of ~1,800 kWh/m<sup>2</sup>/year. This energy generation capacity has successfully obtained an annual savings about RM1,000,000, and reduced an about 1,465 tonnes of carbon dioxide emissions, based on a grid emission factor of 1.05 kg CO<sub>2</sub>/kWh. Operating under a self-consumption model, the installation not only exemplifies technical best practices but also embodies a larger national shift, aligning with Malaysia's National Energy Transition Roadmap (NETR), the Malaysia Renewable Energy Roadmap (MyRER), and the nation's pledge to achieve net-zero emissions by 2050. As Malaysia moves to decarbonize its electricity grid, which currently dominated by natural gas and coal, the Parliament's PV initiative represents a critical precedent for institutional-scale decarbonisation and grid-integrated solar adoption. Spearheaded by the Public Works Department of Malaysia (JKR), this project shows the importance of engineering-led public agency in catalysing Malaysia's green energy transition. It also signals regional leadership as Malaysia assumes the ASEAN Chairmanship, showcasing how green energy can be embedded within national identity, statecraft, and symbolic architecture. This case study offers a replicable framework in integrating distributed solar systems into heritage-sensitive, high-security, and politically symbolic environments, supporting both national sustainability targets and ASEAN energy transition aspiration. injection molding industry. A significant reduction of the cycle time by 51% without any loss in part quality was achieved.