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Comparative Assessment of Small Modular Reactors versus Large Nuclear Power Plants for Future Electricity Generation in Libya

This study comprehensively investigates the potential adoption of Small Modular Reactors (SMRs) in Libya, contrasting their implementation with that of large nuclear power plants (NPPs). It conducts a comparative analysis encompassing various crucial aspects, including:

• **Economic considerations:** The study evaluates the comparative capital costs, operational expenses, and long-term economic viability of both SMRs and large NPPs in the Libyan context.

• **Workforce requirements:** An assessment is made of the workforce requirements for each technology, considering existing expertise and the need for potential training and development programs.

• **Project timelines:** The study compares the expected construction and commissioning timeframes for each scenario, considering potential advantages of standardized modular construction offered by SMRs.

Three distinct scenarios are investigated to provide a nuanced understanding of the potential applications of SMRs:

• **Scenario 1:** This scenario assumes the construction of a single large NPP equipped with a VVER1200 reactor, situated in Sirt city, based on existing site selection studies.

• **Scenario 2:** This scenario explores the deployment of multiple ACP100 SMRs, also utilizing Pressurized Water Reactor (PWR) technology, all located in Sirt.

• **Scenario 3:** This scenario investigates the feasibility of implementing multiple SMR-based NPPs distributed geographically across Libya. The study outlines key factors to be considered when selecting suitable locations, including:

Geographic considerations: Geological and environmental characteristics will be evaluated using data from national research institutions.

Population proximity: Siting near population centers will be prioritized to minimize transmission losses and maximize grid efficiency.

Water resources: The study will assess the feasibility of utilizing the Great Man-Made River for water supply in regions with limited resources.

Country OR International Organization

Libya

Email address

Tariqmolatim@gmail.com

Confirm that the work is original and has not been published anywhere else

YES

Author: MALATIM, TARIQ (Libyan Atomic Energy Establishment)

Co-author: Mr BEN GHZAIL, Mustafa (Libyan Atomic Energy Establishment)

Presenter: MALATIM, TARIQ (Libyan Atomic Energy Establishment)

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