An Analysis of Policy, Regulatory, and EIA Requirements to Support Sustainable Development of Nuclear Power in Malaysia

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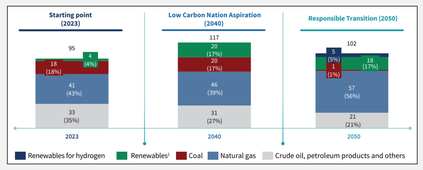
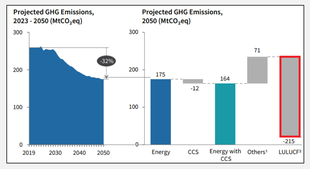
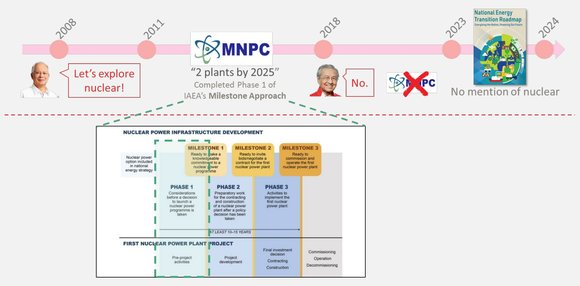
Introduction

- Malaysia aims for net-zero greenhouse gas emissions by 2050, while heavily relying on fossil fuel and carbon offsets from forestry. This presents risks to achieving net zero targets and potentially jeopardizes energy security.





- Nuclear power offers promising avenue for diversifying energy portfolio + progress to achieve net-zero. Despite previous plans and collaboration with International Atomic Energy Agency (IAEA), nuclear development progress hindered by public opposition, safety concerns and political decision; particularly after the Fukushima Daichi incident in 2011.

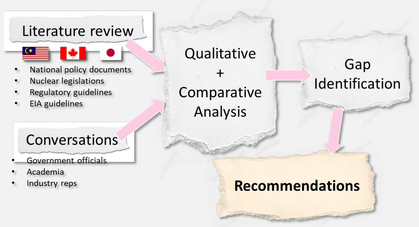


Research Question

How can Malaysia improve its policy framework, regulatory regime and environmental impact assessment (EIA) framework to facilitate the sustainable and publicly acceptable integration of nuclear power in its energy mix?

- The research aligns with 3 areas out of IAEA's "19 Infrastructure Issues" outlined for nuclear energy development.

Methodology



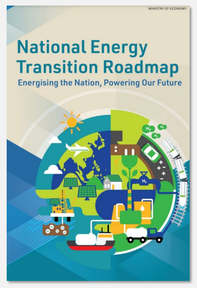
Interdisciplinary Aspects & Sustainable Development Goals

Energy	▪ Diversifying Malaysia's energy mix; reducing reliance on fossil fuels.
Environment	▪ Mitigating climate change by reducing GHG emissions. ▪ Mitigating environmental impacts of nuclear power operations.
Governance	▪ Developing effective policies and regulatory frameworks

1 Energy & Nuclear Policies

Current

- Malaysia's National Energy Policy (NEP) 2022-2040 and National Energy Transition Roadmap (NETR) focus on renewable energy but omit any mention of nuclear power.
- The National Nuclear Technology Policy 2030 (DTNN 2030) acknowledges potential of nuclear technology in various sector, but not explicitly advocating for nuclear power generation.



International Comparisons

- Canada passed Canadian Net-Zero Emissions Accountability Act (CNZEAA) 2021. Green Bond Framework revised to include nuclear. Nuclear policies supported by CANDU technology and substantial uranium mining resources. Ongoing Small Modular Reactor (SMR) Action Plan.
- Japan passed Act on Promotion of Global Warming Countermeasure 2021. Reversing earlier decision to phase out of nuclear (post-Fukushima incident) back to adopting the energy source, in consideration of climate urgency.

Recommendations for Malaysia

Legal Mandate for Net-Zero Target:
- Enshrine the net-zero target into law to demonstrate firm commitment to climate action and catalyze investments in R&D.

Policy Framework Revision
- Revise the NEP and NETR to include nuclear power as a potential contributor to the nation's energy mix and net-zero ambitions.

Establishing a Nuclear Energy Program Implementing Organization (NEPIO)
- Create a dedicated organization to coordinate efforts, policy-making, and public communication.

Fostering International Collaboration
- Actively seek partnerships and collaboration, particularly with Canada, to leverage expertise and technology.

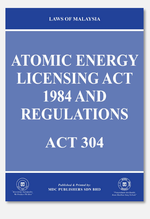
Financial Backing and Incentives:
- Provide government-backed financial support mechanisms and incentives to catalyze nuclear power development.

Implementing a Compliance Carbon Market (CCM)
- Transition from a voluntary carbon market to a compliance market to intensify efforts for low-carbon energy sources

2 Nuclear Regulatory Regime

Current

- Malaysia's Atomic Energy Licensing Act (AELA) covers licensing requirement for radioactive materials but lacks detailed regulation specific to nuclear power plants. Department of Atomic Energy (DAE) enforces the AELA but may require additional resources and expertise for nuclear expansion. Malaysia is readily a member of the IAEA; signatory to various nuclear treaties.



- Energy Commission (EC) as regulatory body of the national's energy sector, while Sustainable Energy Development Authority (SEDA) manages implementation of feed-in tariffs mechanisms and promot renewable energy development.

International Comparisons

- Canada has a multi-layered regulatory framework with Canada Energy Regulator (CER) and Canadian Nuclear Safety Commission (CNSC) as the primary federal regulator
- Japan established Nuclear Regulation Authority (NRA) post-Fukushima to strengthen nuclear safety regulation and restore public trust.

Recommendations for Malaysia

Comprehensive Regulatory Framework
- Enhance the AELA to encompass the entire lifecycle of nuclear power, including uranium mining and enrichment.

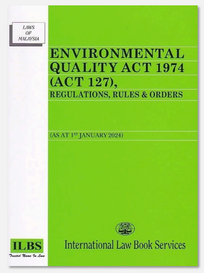
Expanded Role of the Department of Atomic Energy
- Expand the scope of the DAE to specifically include regulation of nuclear power plants, requiring increased resources and expertise.

Strengthening Regulatory Structure and Independence
- Consider separating the DAE into distinct bodies to improve transparency and impartiality, or ensure sufficient checks and balances if the dual function is maintained.

3 EIA Framework

Current

- Malaysia EIA Framework, anchored in the Environmental Quality Act (EQA) 1974, require EIA reports for various projects but faces criticisms regarding effectiveness, transparency, and public participation mechanisms.



- Projects requiring EIA are classified into First Schedule and Second Schedule of different approval process, based on impact significance.
- Various studies criticize its effectiveness and potential manipulation of impact declaration to reduce assessment scrutiny.

International Comparisons

- Canada's EIA system - governed by the Impact Assessment Act (IAA) - emphasizes public participation and Indigenous consultation, with a robust scientific assessment.
- Japan's EIA framework - based on Impact Assessment Law 1997 - has been strengthened post-Fukushima, with greater emphasis on risk assessment and long-term monitoring.

Recommendations for Malaysia

Strategic Environmental Assessment (SEA) for Nuclear Energy
- Conduct a comprehensive assessment of the environmental effects of nuclear energy throughout the entire lifecycle.

Establish a Dedicated EIA Agency and Independent Scientific Advisory Board
- Create a specialized agency to administer and enforce EIA, with a board to provide scientific expertise.

Refine Project Schedule Categorization
- Revisit and refine the definition of First and Second Schedule projects to reduce the risk of exploitation and ensure nuclear projects are consistently categorized as Second Schedule.

Strengthen Enforcement
- Implement stricter penalties for non-compliance with EIA requirements and establish an accountable system to track and enforce compliance.

Develop a Centralized EIA Database
- Create a comprehensive online database to enable public access to information on projects and facilitate informed public discourse.

Empower Public Participation
- Invest in educational programs and outreach initiatives to improve public awareness of the EIA framework and provide opportunities for meaningful engagement.

Other Potential Sustainable Development Tools

Global Partnership Collaborative Model
- Leverage a partnership with Canada to access CANDU reactor technology and expertise, building capacity through technology transfer, training, and regulatory cooperation.

Small Modular Reactors (SMRs)
- Utilize SMRs as a testing platform to gain experience in nuclear energy, assess public acceptance, and evaluate regulatory and EIA frameworks.

Political Stability and Cross-Partisan Consensus
- Establish a stable policy environment and cross-partisan consensus to ensure the long-term viability of any nuclear program.

ASEAN Regional Cooperation Model
- Foster regional cooperation with Southeast Asian neighbors through ASEAN platforms to harmonize regulations, share resources, and collaborate on emergency response planning.

Potential Studies on Sustainable Development Issues
- Conduct future studies to address public perception, technical feasibility of SMRs, policy impact analysis, cost-benefit analysis, and waste management solutions.

Conclusion

Key Takeaway

- Malaysia can successfully integrate nuclear power into its energy mix by implementing the recommended strategies for policy, regulatory regime, EIA framework, and sustainable development tools.

Challenges and Opportunities

- The process will require political will, commitment, and public engagement to address concerns and build trust in nuclear energy.

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