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## **Nuclear Energy Needs Analysis of Energy Planning Towards Net Zero Emission (NZE) 2060 in Indonesia**

In order to achieve the Net Zero Emission (NZE) target in 2060 in accordance with Presidential Regulation No. 98 of 2021 concerning the value of the carbon economy, Indonesia plans an energy transition from fossil energy to new renewable energy (NRE) because it is more environmentally friendly and can reduce carbon use and emission levels. However, in making the energy transition from fossil energy to NRE, nuclear is still the final choice for meeting future electricity needs. Whereas the potential for nuclear energy development is very large in Indonesia, seen from several factors. Nuclear energy can make a dominant contribution to fulfilling electrical energy needs, accompanied by a clean energy processing process. The plan to operate a new nuclear power plant (NPP) will begin in 2045 with a choice of low-power nuclear power plants, namely small modular reactors (SMRs) from generation III and III+ based on light water. Therefore, it is necessary to analyze the need for nuclear energy in energy planning towards NZE in 2060 in Indonesia. Some of the analyses carried out are SWOT analysis, TOWS analysis, PESTEL analysis, external analysis between customer need and corresponding benefit, and SMRs price parameter analysis. From the analysis that has been done, it can be concluded that the need for nuclear energy is quite large to fulfill the supply of electricity needs, which is increasing every year. If it only relies on other NRE to meet electrical energy needs in 2060, there will be a gap that is quite large and difficult to realize. In the energy planning that has been done, a roadmap is made for the energy transition from fossil energy to renewable energy towards NZE in 2060. The result is that if it goes according to the existing roadmap, Indonesia's target for NZE in 2060 can be achieved.

### **Country OR International Organization**

Indonesia

### **Email address**

putr008@brin.go.id

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

Yes

**Author:** OKTAVIANTO, Putra (National Research and Innovation Agency)

**Co-authors:** Mr SETIAWAN, Muksin Aji (National Research and Innovation Agency); Prof. PERMANA, Sidiq (Institute Technology of Bandung)

**Presenter:** OKTAVIANTO, Putra (National Research and Innovation Agency)

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