COAL-TO-NUCLEAR TRANSITION IN POLAND – AN ASSESSMENT OF NUCLEAR SAFETY ASPECTS

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Current climate policy in UE foresees a significant decrease of CO_2 emission to the environment. The Polish power sector, which is based mainly on combustion of fossil fuel, of which more than 70% is hard coal and lignite faces the great challenge of energy transformation. One of the possible decarbonization paths is the coal-to-nuclear transformation, in which it is proposed to replace the coal-fired unit with a nuclear unit in the same location. The poster presents results from preliminary site assessment for potential implementation of such a solution for the case of Polish coal systems. The possibility of using 3rd generation nuclear reactors as well as 4th generation reactors was considered. Nuclear safety related issues of the coal-to-nuclear transition are crucial for its successful implementation. For this reason, an extended analysis of the coal-to-nuclear process has been performed in terms of its safety. First of all, formal requirements and recommendations imposed by international and national organizations on the process of designing and operating nuclear power systems have been subjected to in-depth analysis. Moreover, potential nuclear hazards to the personnel and local population have been identified. Issues related to security systems of the tested reactors with whole the auxiliary infrastructure as well as management of spent nuclear fuel and radioactive waste are also no less important, which is why they were also assessed during our analysis. As a result of these analyses, key criteria were identified that may be an obstacle to modernization in the locations of currently operating coal-fired units. In addition to nuclear safety analyses, technical analyses were also conducted. The entire research allowed for the determination the strengths and weaknesses of the potential Coal-to-Nuclear investment and can serve as a guide for decision-makers as to whether and to what extent nuclear energy can be developed in places of existing coal units.

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160_abstract