



## Small Modular Reactors for Countries with Small to Medium Electric Grids – An Economically Sensible Solution

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There has recently been a renewed interest throughout the world in small nuclear units for generating electricity and for other applications. A report by the World Nuclear Association discussing the advantages of small modular nuclear reactors (SMRs) over traditional nuclear reactor designs, states that “modern small reactors for power generation are expected to have greater simplicity of design, economy of mass production, and reduced siting costs. Many are also designed for a high level of passive or

inherent safety in the event of malfunction.”

Since the inception of nuclear power, the size of reactor units has grown from under 100 MWe to more than 1600 MWe. Today, due partly to the high capital cost of large power reactors and partly to the need to service small electricity grids, there is a move to develop smaller units. These may be built individually or as modules in a larger plant. SMRs are a good fit in markets where anticipated electricity demand is projected to increase incrementally, because SMRs could be built in series as needed.

SMRs might be particularly attractive in countries that currently rely on diesel generators for producing electricity. Small reactors could make economic sense because of the high cost of diesel generation compared to the low marginal cost of producing electricity from nuclear energy. (Keeping in mind the initial investment costs and the need to establish a national regulatory program.) Some SMR designs are fabricated in a factory and then delivered to the site. This could be a solution for markets that lack the qualified engineers and skilled craft workers needed to construct large reactors on site.

This paper will provide an overview of the types and attributes of SMRs in use or under development worldwide, describe the similarities and important differences between designs, discuss potential applications for SMRs, including baseload electricity generation, electricity generation for remote locations and areas with limited grid capacity, desalination, process heat for industrial applications and district heating, and hydrogen production.

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