

Perspective

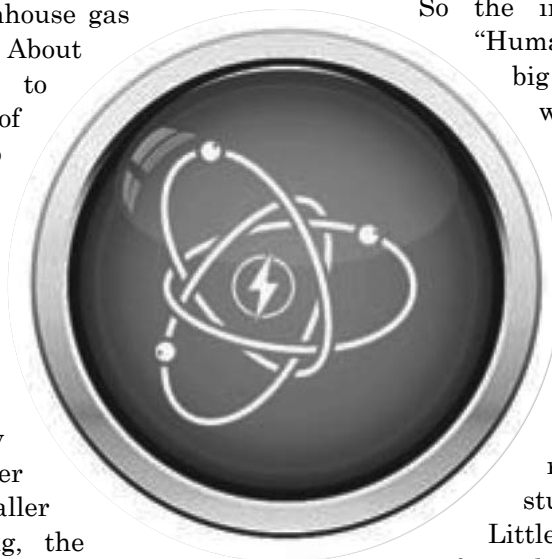
Future of Atomic Energy: Nations in the Race

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This branch is internationally well setup in view of the search for quick (speedy) development of greenhouse gas neutral energy supply. There is energy change in the USA in spite of the exit from the Paris World Climate conference through the US President Donald Trump. Washington does not want that the US Federal state turns over to a fresh position. The themes are known. Network consolidation and stability, consolidation of renewable energies are the real question.

The US undertaking advisor McKinsey draws up so in position in Federal State New York. But atomic energy is not thematised. It is today the component of the mix energy generation and should also be so in 2040, when east coast state wants to attain greenhouse gas free energy generation. About 20TWh should contribute to the total requirement of about 220TWh according to McKinsey.

Atomic energy is for many states a possible medium in order to attain lesser greenhouse gas emission. Human being requires worldwide atomic energy in every form same whether in bigger power works or flexible smaller plants says Agnate Rising, the general director of world atomic energy association (WNA) during conversation with VDI nachrichten.



“Under smaller reactors the small modular reactors (SMRs), the WNA plant understands with less than 300 MW electrical performance. It gives in between many completely differing SMR projects, in biggest part with rediscovery of the present government” she knows. However standard big power works practice SMRs are the exception for the time being there are four SMR designs of which there are plants in operation. Six further are under construction, for ten SMR types are for advanced plants critics like Michael Sailer ex manager of Oko Institute views SMRs nicht as promising. They will not function factory worthy, as the proponents conceive, he says to the VDI nachrichten in August 2019.

So the investors are not convinced.

“Human being will only construct big reactors of present day type, while these are unique reactors, which are in comparison with performance output halfway lucrative” he clarifies. All new construction projects, which at present produce worldwide are established in state background.

In Germany there is retro construction before all of the reactors. Not only there: a study of advisor of Arthur. D.

Little sees the retro construction of 80 plants globally upto 2030 which result in a market value of 105 milliard Euro, out of that 45 milliard Euro for special firms in this segment.

Several Types of SMR

1. Liquid Metal Cooled Reactor (LMR):
Properties: With these SMR types according to GSR exclusively quick reactors, the neutrons must not be moderated. As cooling media lead (Pb) lead bismuth (LBE, Lead bismuth Eutecticum) and Natrium (Na) are used. The lower steam pressure of the cooling medium renders possible according to GRS atomic exit temperature upto about 750°C, steam and heat get from here for further use, delinking and use Fuel: Uranium in combination with platinum.
2. Molten Salt Cooled Reactors (MSR):
Properties: MSR stands for molten salt reactors the name giving Salt fusible serves as cooling but also as carrier for fuel. The association for reactor safety (GSR) in Cologne characterises. Good temperature transmission quick permeability for neutrons and in the emission field very stable. The melting remains stable upto 1400°C which renders the high for industrial high temperature process possible. On the contrary to LWR and HWR these are thought for electricity and heat generation as also for desalination plants.

MSR concepts work not only with thermal but also with quick neutrons. These plants could

be placed from there also for transmutation or for burning arms capable materials. Fuels: enriched uranium u_{235} , ^{232}Th or ^{239}Pu .

3. Light water cooled Reactors (LWR):
Properties: The temperature level (approximately 300°C) is fixed before all through the steam pressure of the cooling circulation. Light water in reactor technique defined as normal water on the basis of protium (Hydrogen atom with a proton in atom), serves as moderator and neutron absorber. There are pressure and boiling water reactors under it.
4. Gas cooled Reactors (GCR) : Properties: Gas cooled SMR concepts reach importantly higher cooling medium temperature (upto 1000°C) as other SMR types. How MSR can these serve for temperature preparation for process temperature, also serve for low temperature application.
5. Heavy water cooled Reactors (HWR):
Properties: Heavy water (D₂O) contains Hydrogen isotope Deuterium (Core of atom contains a Proton and a Neutron). Deuterium is a better moderator than normal Hydrogen, as it absorbs less Neutrons.

Ref.: VDI nachrichten, 29 November 2019.
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