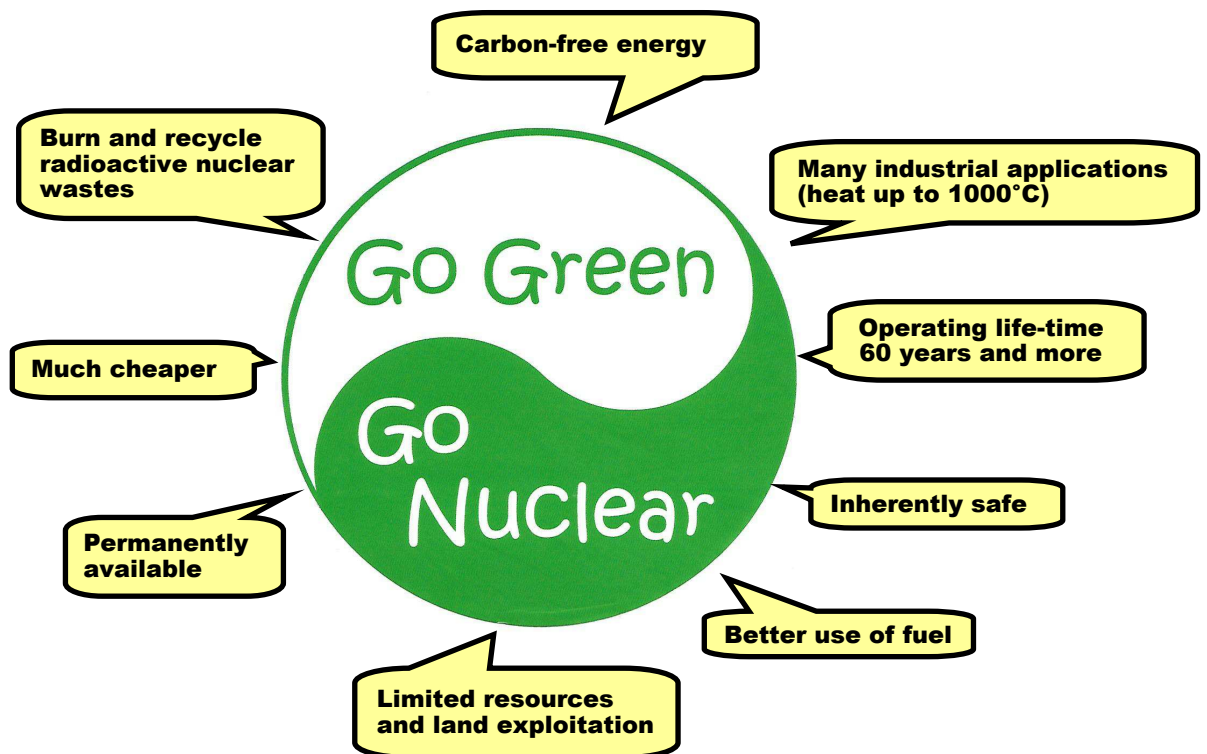


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Nuclear Power Operations & Financing

Turn around in the European Energy Discussion with the next generation of nuclear reactors



The Dual Fluid Reactor (DFR) presently being developed in Germany is one of the most promising new reactor concepts

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N.A. van Zijl

1. Why Nuclear Energy ?

Due to strong mistrust and radiation fear the nuclear energy discussion has been blocked in many countries for many years. In the last few years enormous progress has been made in the development of advanced nuclear reactor concepts. The IV. Generation of Nuclear Reactors has the potential to bring the turn around in the European energy discussion. Nuclear energy is the answer to carbon-free energy and is cheaper, safer, more sustainable (less space required and less waste) and faster to implement than any other energy source. So there is every reason to welcome it.

Why are we then so reluctant to accept such a potential to ease our life. The reasons lie certainly in the origin of this technology with its devastating destructing forces experienced in the second world war and the fear for the still existing nuclear weapon programs. This has however nothing to do with the application of nuclear as a source of energy for mankind. This is „Atoms for Peace“ .

With nuclear energy and renewables we already have entered in a new era in the provision and use of energy for mankind. Both forms of energy will have their place in society and have their specific areas of application. Renewables will be applied for decentralized applications whereas nuclear energy will be applied at large scale industrial applications and large towns. Great efforts are being put in research of making nuclear installations also suitable for much smaller applications in particular for remote sites.

The table enclosed shows the main reasons why nuclear energy will be the dominating energy in the future. It is mainly because of the energy density, the availability, sustainability, safety and unlimited resources. Over the last 60 years nuclear power has proven to be reliable and safe despite the accidents which occurred. The existing anxiety regarding radiation can be cured through education and communication.

Energy for Mankind			
Human Era Time period	Pre-industrial before 1800	Industrial 1800 - today	New Era today - 2200?
Fuel / energy source	Wood, Water, Wind (sun/fire)	Fossil Fuels (coal,oil,gas)	Nuclear Energy (plus renewables)
Energy density kWh per kg	0.0003	1 to 7	20'000'000
Points in favour	- accepted - familiar	- available 24/7/365 - enables today's standard of living	- available 24/7/365 - sustainable - safe, unlimited
Points against	- intermittent - huge footprint - weak	- wastes, emissions - politically unsecure - limited resources	- radiation fear, - nuclear mistrust
Fuel consumption per Person per life	10 billion kg	1 million kg	1 kg
Greenhouse gas emissions g per kWh	10 - 100	450 - 1230	20 - 25

- Nuclear is the answer to our needs for energy and to save our planet from climate change and excessive exploitation.
- Renewables are a welcome addition to nuclear in particular for decentral applications. It can however not be the aim to return to the power sources of the pre-industrial era.
- The future use of nuclear power will be on a much wider scale of power ranges