

# THE JAPAN CATASTROPHE

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European Physical Society  
more than ideas

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As we witness from afar the Japanese catastrophe currently unfolding, our sympathy goes out to the people of Japan. Our thoughts are with our friends and colleagues in research and our hope is that they and their families have survived the earthquake and the devastating Tsunami which followed.

In some European countries, the public response has concentrated on one aspect of this tragedy, the damage of the near-by nuclear power stations and the consequences on the use of nuclear energy in Europe. This discussion is understandable but premature because many of the consequences are not yet known and the processes within the power plants are not yet in equilibrium and under control. We do not yet know the full extent of the damage.

The following can be said at present. The safety devices, measures and procedures functioned correctly and have stopped the nuclear fission processes. The emergency systems started after the earthquake as foreseen. They were, however, destroyed in the wake of the Tsunami. Following this, measures have been taken to save the pressure vessel and the reactor core, which are not part of a pre-planned emergency mission. The release of overpressure with the consequences of the release of radioactivity is still one of the planned options in a disaster like this. The cooling with sea-water is a viable step but seems to be an improvised and possibly lucky option.

The safety of European nuclear power plants is based on totally different geographical boundary conditions. Europe does not have earthquakes of a magnitude of 9 on the Richter scale, nor are there Tsunamis resulting in the total destruction of the local infrastructure – living areas, roads, railways, harbors, airports, the electricity, gas and water supply systems. It is obvious that a nuclear power station would be strongly damaged under these circumstances. Such a scenario cannot

happen with European nuclear power stations. If the pressure vessel of the Fukushima reactors remains intact and the radioactive inventory is contained, any eventual damage caused by the release of radioactive material will be small in comparison to the primary damage through the natural catastrophe. But also here conclusions are premature at this moment.

We hope that the radioactive material is contained for the sake of the nuclear energy debate in Europe as well. We have to look at the environmental risks of fossil fuels and those of nuclear power on the basis of the European safety situation and in addition, on what we learn from the Japanese events. How to make the transition from the present fossil fuel dominated mix to one which is CO<sub>2</sub>-free without major losses of economic vitality cannot be based on emotional considerations. It is clear that those European countries which generate electricity using nuclear power produce less CO<sub>2</sub> per capita than those who do not. It is also clear that renewable energy forms will not be sufficient to supply Europe with electricity as long as technical issues, such as storage, are not solved. Therefore, at present, the replacement of nuclear energy can only be through fossil fuels, the most benign of which is gas, increasing, however, Europe's political and economic dependency. We should wait until we have a complete overview of the consequences of the Japanese tragedy before we decide about the lesser evil.

This catastrophe shows once more, how important energy supply is for all of us and, therefore, how urgent it is to pursue research and development of a wide portfolio of power sources – renewable, conventional and nuclear. The European Physical Society as an independent organization is aware of the potential and specific risks of these technologies and supports the scientific and technological development of the best options. ■



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