

While the eyes of the world focused on the climate conference in Copenhagen, Dr Jef Ongena's exposition on nuclear fusion held the attention of about 80 listeners at the Damiaaninstituut in Aarschot. Ongena is the head of a group of 50 scientists from all over the world. His 'Task Force Heating Studies' (Culham, UK) look for future alternative energy resources.

The previous century's spectacular growth in world population combined with the gigantic increase in energy use – mainly from fossil fuels – caused a rapid rise of CO₂-levels in the atmosphere. That has led to a continuing increase in average global temperature. Consequences are becoming more and more visible. Moreover, there is no guarantee that the entire ecosystem will ever return to its previous state when critical thresholds are crossed.

Dr Ongena observes all these factors and draws the following conclusion: we urgently need to look for another kind of energy production. Reading, researching and critical analysis are the key elements of his talk: to draw one's own conclusions, supported by facts and observation. Such facts are that the total daily expenditure per person in the USA equals an entire day's use of 4 electric cookers with 4 hobs, while people living in developing countries have to make do with 1 hob per person! What's more in the course of the next 50 years global expenditure will double. To continue living as we are today, we need 300 power stations of 1000 Megawatt. Change is necessary!

Ongena suggests nuclear fusion as a possible solution to the problem. Its biggest advantages are virtual inexhaustibility, cheapness, availability, and unique safety and environmental characteristics.

In England Ongena helped build the tokamak JET, the biggest nuclear fusion machine in the world: 'a cathedral of science' and 'a paradise for physics and engineers' to use the speaker's lyrical words. During the exposition, Luc Vangenechten – organizer and physics teacher – assisted Dr Ongena with simple but clear experiments, to explain the basic principles of JET.

On a larger level the JET-experiment achieved its main goal: show that nuclear fusion can reach a break-even between given and produced energy. Scientists such as Dr Ongena are already dreaming of a newer and even more fabulous experiment, ITER (Cadarache, France). ITER is an international project: Europe, the USA but mostly Asian countries are co-operating, which is a promising vision taking into account that the biggest part of the future world population will live in these areas. By 2060 scientists should be able to build commercial fusion power stations, based on the findings of experiments such as JET and ITER. For the first time mankind knows how to heat matter to 200,000,000°C, and enclose and control that heat in a safe way.

Dr Ongena is very much driven to find solutions for man's energetic and environmental problems, because he fears that "values will survive, but maybe not mankind!".

Every attendant received an interesting syllabus and a couple of fascinating DVDs, including information on the EFDA – European Fusion Development

Agreement – and a futuristic film on a class in the year 2100. The latter shows a teacher explaining the process of nuclear fusion to pupils using innovative didactic methods.

Through this exposition, Damiaaninstituut Aarschot – a school strong in technology, smart in sciences and industrious in economics – provided energy for the future!