

There's no planet B! How to avoid the perfect storm

“There's no planet B! How to avoid the perfect storm” is the title of the conference that we attended on the 4th October 2022 in the main hall of the University of Trieste, held by chemical engineer and professor Maurizio Fermeglia. The lecture focused on the need to act now in order to avoid the combination of factors such as lack of food and water, overpopulation, and energetic crisis, which are strictly related.

Global warming is not a modern issue, but it was already discussed in 1824 by Jean Baptiste Joseph Fourier, who predicted the greenhouse effect: nowadays the impact of these gasses overcomes the predictions, as the IPCC stated that 95% of the responsibility for climate change is due to mankind.

Even if there is still someone who denies climate change and attributes global warming to volcanic or solar activity, orbital changes or aerosol, it is scientifically proven that greenhouse gasses' emissions play a major role in this phenomenon. Some examples that verify this assumption are the data collected on Mauna Loa, a volcanic island in Hawaii which hosts a monitoring laboratory. Analyzing today's data (05/10/2022), we can find out that the CO₂ concentration is 414.89 ppm, which has increased by 1.48 ppm since last year.

The consequences of climate change are evident: sea level rise, decrease of productivity for plants and biodiversity loss are only some of them. The rise of temperature will increase thermal excursion in the cities, so that Catania, for instance, will turn out to have the same temperature of the Sahara region by the end of this century. Permafrost melting will cause the release of CO₂ bombs in the atmosphere combined with methane, which will lead to an exponential growth of greenhouse gasses' concentration (1 kg of methane is as polluting as 24 kg of CO₂).

Nowadays, our energetic system is inefficient because just 30% of the energy produced by fuels is actually used for the services of machines. On the other hand, there is a rising demand for energy, indeed in 1912 Giacomo Ciamician, a chemist from Trieste, affirmed that the annual consumption of energy was 1 TW, while now is forecasted to become 24 TW in 2040.

70% of the energy consumed still comes from fossil fuels, which implies that around 2050 there will be an “oil gap”: this will especially impact on the transportation system (30% of energy is devoted to transportation).

Some indicators such as EROEI (Energy on Returned On Energy Invested), LCOE (Levelized Cost Of Energy) and LCA (Life Cycle Assessment) help to examine the complex combination of the effects of the emissions on human health and resources availability.

Considering all these data, professor Fermeglia stated that one of the best solutions (both for the environment and the energetic system) is hydrogen electrolysis, useful to produce energy without carbon emissions, especially for heavy transportation.

We have too little time to act: “the Oil Age will not end because we run out of oil!”.