THE JAPANESSE NUCLEAR CRISIS. WILL THE GLOBAL CLIMATE CRISIS WORSEN?

In order to avoid a critical increase in global temperature, greenhouse gas (GHG) emissions ought to be drastically reduced. This can only be achieved with a large variety of energetic options and a substantial efficiency increase. Among the alternatives to de-carbonize energy, the nuclear one is the most controversial; however, it has received an important impulse in recent years. Now, after the nuclear accident in Japan, criticism has multiplied and the security of existing facilities worldwide is being re-evaluated and those programmed are being re-studied. Purchase orders have been postponed and/or plans delayed. Based on decades of development, nuclear plant builders claim that their advanced reactors of third generation would have endured what occurred in Fukushima. The replacement of nuclear plants is not a trivial matter. Germany, being required to reduce its GHG emissions, closed several of its oldest reactors after Fukushima, but is having problems with the alternative sources of electricity, since eolic energy is produced in the north and environmentalist movements oppose building a 'superhighway' of high distribution towers crossing the middle of the country to reach the south, where most of the demand lies.

Statistics for the end of 2010 indicate that 441 nuclear reactors were in operation, producing 376.3GWe, 14% of the world's electric energy. There are 58 reactors under construction, 152 have been ordered or planned and 337 have been proposed (www.world-nuclear.org/info/reactors.html). In principle, all of them would be in operation by 2030. The countries where more reactors are under construction are China and Russia, with 23 and 10, respectively. The majority of the 489 programmed and/or proposed reactors correspond to developing countries, specially emerging economies (159 in China, 60 in India and 15 in South Africa), whose most feasible alternative in substitution of the nuclear one, would be carbon driven thermoelectric power plants, which emit large amounts of GHG. China, the largest GHG emitter, is building 12 thermoelectric plants per year, a number that would further increase if there is a retrogression of the nuclear alternative. On a global scale, it is estimated that eliminating one half of the programmed nuclear reactors would lead to reach the levels of GHG predicted for 2035 much earlier, by 2030. It has been well established that in order to avoid a global warming higher than 2ºC, GHG emissions must have to be reduced to one half by 2050 (*Interciencia*, 35: 624-631, 2010). According to the *BLUE-map* scenario of the International Agency for Energy, in order to achieve this goal, 24% of all electricity would have to come from nuclear plants, which implies a substantial expansion of this source. In such scenario, 48% of the electricity would come from renewable sources (www.iea.org/techno/etp/etp10/English.pdf). Nuclear energy would provide the 'basic charge' to the electrical network all the time, compensating the intermittence of solar and/or eolic sources. In consequence, a backlash in the use/development of nuclear energy would negatively influence the climate crisis. The answer to a local event would increase global warming.

The dangerous levels of GHG have been exceeded, arctic ice is melting and methane bubbling in frozen soils, mountain glaciers are disappearing, heat waves and flooding are more frequent, biodiversity is diminishing and the effects of the Niño/Niña pair are being potentiated (*Interciencia* 36: 245, 2011). The future needs of energy are enormous, specially in developing countries; we'll amount to $\sim 9 \times 10^9$ people by 2050. A realistic evaluation of the global energetic future that takes into consideration -in addition to the climate problems- availability, prices and energetic safety, indicates that nuclear energy has a role to play. Can we afford to veto an abundant energy source that emits practically no GHG? The consequences of the "global climate mushroom" must be pondered.

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