

CLIMATE CHANGE AND THE SEA

The upcoming meeting on 7-18 December 2009 in Copenhagen shall be an opportunity to start new negotiations aimed at further implementing the Convention on Climate Change and at signing a new agreement on climate which is expected replace the current Kyoto Protocol.

The conference will host various Planet Regions, clashing because of their different urges and drives. On one hand, the reasoning of globalised economy will argue in favour of emission reductions derogation, of rewards in exchange for delayed system conforming – in other words, in favour of the so called '*necessary poisons*' in the name of a development which set-off is suffocation. On the other hand, the dignity of those who are witnessing the agony of their own Earth and Sea.

Against this background, a change of approach is clearly needed, by introducing a model of shared responsibility as far as CO₂ and other greenhouse gas emissions and pollutants drained into the sea are concerned. Each Country shall take on its own responsibilities and no options shall be offered in terms of compensation for the exceeding emission quotas with Countries that have been suffering from difficult development trends. In addition, no account shall be given to any emission reduction target derogation.

This does not merely imply that industrialised as well as emerging countries shall undertake to reach certain reduction targets based on their possibilities, but that shall put such engagements into something tangible, whose outcome may be monitored. In this respect, special sanctions shall be imposed not only to industrialised Countries, but also, for example, through the exclusion of emerging Countries from funds for co-operation and development projects not aiming at reduction targets.

Alongside the wise statements regarding the willingness to reduce CO₂ emissions, often not followed by tangible legal provisions, it is not clear why only one side of the problem is to be tackled – a very important one, indeed, but not sufficient. Those who love the Planet they live on and especially its seas, representing 70% of its global surface, wonder why scientists and institutions have not been engaged in a policy aimed at the sea. Since when the sea is in good health conditions, it absorbs up to one third of CO₂ emissions through physical-chemical processes as well as biological ones, thanks to the photosynthesis of existing phytocenoses.

When the physical-chemical processes become predominant, it means that immobilisation CO₂ systems at sea are stammering. More immobilised CO₂ into the sea, indeed, means an increased water acidity and thus a lower pH, whose current estimated value is – 0.1 pH units; yet, by this pace, it would reach about – 0.5 pH units in 2100 according to some estimations, with unsurprisingly tragic consequences for the ocean life. Luckily, the high buffer power of sea water maintains a lofty absorbing capacity, able to limit pH fluctuations.

There is a strong relation between the atmosphere warming and the sea warming. Based on various studies, it has now been proven that the quantity of CO₂ let into the atmosphere since the Industrial Revolution should have caused a higher rise in temperature than actually recorded. Where has this missing heat gone? The answer is simple and notorious: into the seas. It is calculated that ocean masses have stored as much as 50% of the heat produced by mankind.

The issue of sea water warming has now become a global one. In this respect, NOAA has recently reported that the temperature measured on the Ocean surface in the period June-August is 0.6 degrees higher than the average for the current century; yet the major concern lies in the fact that for the first time such rise has now been affecting the deepest sea layers: below 1,000 metres. This leads us to think of thermocline changes and how it may affects biological processes, with special reference to natural resources. Unfortunately, impossible as it may seem, the requests made to scientists for information regarding temporal and spatial thermocline changes, in several situations of marine commercial interest, have hardly resulted in any adequate feedback.

Dealing with emission reduction alone is extremely restrictive, as this actually neglects the effects of phytoplankton pollution caused by hydrocarbons; phytoplankton just serves the function of absorbing the CO₂ concentration in the atmosphere.

Oceans absorb up to 30% of the CO₂ produced by anthropic activities and, by jeopardising their normal operation, there is a risk that the 20% emission reduction target will not be achieved.

This issue has not even been paid sufficient attention by the media, where it is not duly highlighted the fact that the stable concentrations in air components is due to the sea .

The Mediterranean Sea

The above-mentioned phenomenon is particularly noticed in the Mediterranean basin. Indeed, although it only accounts for 0.8% of the planet waters, it undergoes major stress due to the exceptional level of concentration of maritime traffic, i.e. 30% of the world's maritime traffic and 25% of global hydrocarbons, a figure which is on the rise.

Also smaller seas, even if geologically different from the oceans, help to regulate the climate and they, too, just like the oceans, are the major victims of climate change. Areas especially sensitive and rich in biodiversity, like Mediterranean, have undergone a rise of temperature amounting to 1 degree over the last year, compared to the average for the last 30 years. The news has been further supported by Enea¹-Cnr² release which, with reference to June-August figures, states that surface waters have particularly been affected by such rise. The Tyrrhenian sea holds the negative record, with as much as a 2 degree rise compared to the average temperature over the last 30 years.

The Mediterranean is one of the “*biodiversity hotspots*”, i.e. one of the places on the planet hosting the life of the highest concentrations of different species and environments. The loss of biodiversity, largely caused by uninhibited and illegal fishing, entails a drop in food, protection, tourism and economic development, of coastal and non-coastal nations alike.

We hereby urge the Authorities gathered on the occasion of the 15th United Nations Conference on Climate to take actions in line with an eco-systemic approach, without neglecting any factor responsible for climate change. Investing in order to maintain seas in good health conditions, as well as achieving the emission reduction targets, shall positively affect not only the climate heritage protection, but also the safeguard of human dignity, the improvement of the quality of living and the enhancement of biodiversity.

¹ Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile (Italian National Agency for New Technologies, Energy and Sustainable Economic Development).

² Consiglio Nazionale delle Ricerche (National Research Council).