

## **Contribution of the International Seabed Authority to the thirteenth meeting of the Informal Consultative Process Meeting on marine renewable energies**

1. The thermal and kinetic energy stored in the oceans represents a vast potential for producing renewable energy, particularly in nearshore areas. In recent years, a number of technologies have been developed and extensive industrial and academic research has been carried out to determine the technical and economic viability of these technologies. Farther away from the shore, floating offshore facilities offer several advantages and are being considered as potential sources of electric power for deep sea mining operations. As the sole intergovernmental organization responsible for the exploration and exploitation of mineral resources in areas beyond national jurisdiction, the International Seabed Authority is well placed to contribute to policies related to marine renewable energies.
2. The development of renewable energies depends on the availability of metals at affordable prices. The exploitation of deep seabed mineral resources will open up a new supply source for some of the metals used in renewable energies, and the use of these metals (e.g. copper, nickel, cobalt and manganese) will have an impact on metal prices. Renewable energies incorporate substantial amounts of minerals: wind turbines, for example, need 500 kg of nickel and 1,000 kg of copper; this represents twelve times more copper to create 1 kw than conventional power generation. An electric vehicle has over twice the copper content than a car with a combustion engine (hybrid cars use 2 km of copper wiring and nickel and copper are essential for batteries in such cars). As an essential raw material of steel, the large quantities of manganese on the seabed are increasingly being seen as alternative source for this resource which is becoming very limited on land.
3. Furthermore, the industrial production of renewable energy technologies requires increasing amounts of rare earth elements (REEs) and other metals considered scarce 'technology metals'. Possible shortages in the supply of these metal commodities have raised concern about their future availability and price levels. The Authority has recently initiated a study to investigate the economic and technical viability of extracting these metals from seabed deposits, following some promising indications that considerable concentration of REEs and other trace metals of commercial interest may be present in polymetallic nodules and cobalt-rich ferromanganese crusts.
4. Activities of the Authority relating to resource assessment also contribute to a better knowledge of the last known reserves of metals on Earth. For example, the Authority's effort to model the polymetallic nodule resources in the Clarion-Clipperton Fracture Zone (CCFZ) of the Equatorial North Pacific Ocean, an area covering approximately 4.5million km<sup>2</sup>, is the largest and most complex such undertaking to date. The geological model examines all potential proxy

data variables identified as important indicators of metal content and abundance, and outlines specific datasets that qualify for use in the Geological Model and data information on all known nodule deposits in the CCFZ.

5. The use of renewable energies is also considered in mining operations in the Area. For example, ocean thermal energy, also referred to as Ocean Thermal Energy Conversion (OTEC), converts solar radiation to electric power through the difference in water temperatures between surface water (warm) and deep water (cold). These two reservoirs provide a heat source and a heat sink, enabling the operation of a heat engine producing electric power. The use of floating or drifting OTEC plants has been suggested as a possibility to generate electric power for mining operations and the use of wind turbines and wave energy are also considered on future mining platforms by a contractor of the Authority.

6. The recent exploration of the seafloor for massive sulphide systems, a potential source of high grade copper, gold, zinc and silver, represents a major development of the activities in the Area which will also have an impact on policies relating to renewable energies. Less than six months after the adoption of the Authority's Regulations on prospecting and exploration for polymetallic sulphides in July 2010, two applications for the approval of a plan of work for exploration for sulphides were submitted to the Secretary-General of the Authority by China Ocean Mineral Resources Research and Development Association and by the Government of the Russian Federation for the exploration of seafloor for massive sulphide systems in the Indian Ocean and in the Mid-Atlantic Ridge. Following the approval of those plans by the Council of the Authority on 19 July 2011, the Secretary-General and COMRA concluded a fifteen-year exploration contract in November 2011 and the second exploration contract is to be signed in 2012. These exploration contracts may contribute to our knowledge of those hydrothermal sources and may also offer promising opportunities for the development of thermal energies.

7. At the last session in July, the Council of the Authority also approved for the first time two applications sponsored by Nauru and by the Kingdom of Tonga which make true the participation of developing States in the exploitation of deep seabed resources in the Area. At the same time, those applications provides another confirmation of the renewed commercial interest in deep seabed mining as an alternative source for the minerals that are necessary to fuel economic development worldwide.

8. In parallel to the signature of contracts and the supervision of activities in the Area, the Authority has also embarked on developing cooperation with the scientific community, regional and intergovernmental organizations such as IUCN, the OSPAR Commission, the ICPC and South Pacific Applied Geosciences Commission (SOPAC). In November 2011, the Authority convened in cooperation with SOPAC a workshop in Fiji on Environmental Management Needs for

Exploration and Exploitation of Deep Sea Minerals. The Authority is also committed to making any non-confidential data and information that it has collected available for the study of marine renewables and is keen to play an active role with other international and regional organizations in any developments related to marine renewables that may have implications for the exploration and exploitation of marine mineral resources and the protection of the marine environment in the Area.