

**International Symposium on**  
**“Carbon management & climate change and**  
**Role of Applied Geochemistry in mineral exploration”**

25-27 November 2009

**Concluding Session**  
**Resolutions**

1. The delegates at the fourth (4<sup>th</sup>) International Symposium organized by the Indian Society of Applied Geochemists (ISAG) on the Role of Applied Geochemistry in **Carbon Management and Climate Change and Role of Applied Geochemistry in Mineral Exploration** organized during 25-27 November 2009 at National Geophysical Research Institute (NGRI), Uppal Road, Hyderabad, appreciated the efforts of ISAG to sensitize the community of applied geochemists to various challenging perspectives of carbon management and mineral exploration especially exploration of the concealed mineral deposits.
2. Number of good presentations were made by various speakers on different aspects of handling the challenge of Global warming and Carbon management and it was felt that it is everybody's business to address the challenge before the mankind. It was also felt that many of the ideas presented and discussed during the symposium were worth implementing and initiatives were required to be taken.
3. As a first step, it was unanimously agreed that a working group from amongst the members of ISAG be formed to draft strategies and actionable projects to tackle the challenge of Global warming and climate change.
4. In the valedictory session of the symposium, just after the penultimate open session the delegates felt that it is time for ISAG to make proactive efforts to help accelerate the pace of carbon management and mineral exploration in India.
5. Conscious of the fact that the mother earth has to be protected against vagaries of global warming and climate change and that the concealed mineral deposits of earth have to be efficiently explored for ensuring sustainable development the delegates of the ISAG International symposium resolved.
  - (A) That ISAG would contact various concerned organizations/authorities and academic institutions to help formulate appropriate projects and programmes in the field of application of geochemistry for carbon management and exploration of concealed mineral deposits through both indigenous and international collaborative efforts and that ISAG shall also be a catalyst for implementing olivine based sequestrations approach on life cycle basis around one or two major point sources of carbon dioxide in Andhra Pradesh or at an appropriate location(s).
  - (B) That ISAG shall help formulate a national carbon cycle studies programme which would provide realistic measures for monitoring the efficiencies of natural carbon sequestration related to each geological set up from soils of various agro-climatic regimes to various modern sedimentation regimes of lacustrine and marine environments.
  - (C) The ISAG shall formulate a working group on Carbon management with Director, HRD, ONGC as Chairman.
  - (D) The ISAG shall intimate the concerned authorities that India will contribute better to carbon management and expectations of the Copenhagen meeting by taking recourse to distributed power generation in such a way that each power station can be carbon neutral through the green belt developed around the power station.

(E) The ISAG will recommend to the Prime Minister's office, GOI, New Delhi, that Hydrogen Power should be provided the same or identical incentives as that being provided for implementation of Solar Power and allow the same feed in tariffs for connected Hydrogen Power to the power grid for production above 1 MW and that the effort be made to generate 20,000 MW of Hydrogen Power apart from Solar Power by the year 2020 in India. This would help in reducing the Carbon Footprint of India. (Encl.)

K. Surya Prakash Rao  
Convener/Secretary  
Int. Symposium/ISAG

Explanatory Statement for item E.

The Government of India has made a commitment to our Parliament through the Minister of Environment, Dr. Jairam Ramesh to cut the Carbon Intensity (CI) by 20% from the existing levels by the year 2020. The present level of CI is 0.14 and that of USA is 0.22 and that of China is 0.23. China is the largest Emitter of GHG's at 4.3 Billion tons and US is not far behind at 4.1 Billion tons per year.

During the statement he also added that India would add 20,000 MW Solar Power by 2020.

The Solar Power has a PLF not exceeding 17% and has a Capital Cost of Rs. 10.00 CR per MW and requires replacement of its Battery/Accumulator bank every 5 years thus making this one of the costliest options for achieving Zero Emission Power Generation. The Feed in Tariff for above one MW generation has been fixed at Rs. 18.00 per Unit.

Hydrogen Power generation is one of the most desired options and USA has adopted this as the ideal technology option to pursue in achieving Zero Emission Power Generation. In a Report Published by USDOE - 2007 the identified problem with Hydrogen Economy is the production of Hydrogen, its storage and its delivery. Like Solar Power, this also requires frequent replacements making this as costly as Solar power or about Rs. 10 CR per MW for installed capacity. There is no limitation of PLF for this can be as high as 95%. However the cost of Hydrogen power would also be Rs. 12 per kWh and hence requires similar incentives like Solar Power.

Hence the resolution / recommendation: E.