

# Globally, 73 MT Hydrogen is used for refining, ammonia making and other pure use

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On India's 75th Independence Day, the Prime Minister announced a Hydrogen Mission. Coal is one of the important sources of hydrogen making (Brown Hydrogen) apart from Natural Gas (Grey hydrogen) and renewable energy (Green Hydrogen) through electrolysis. In case of renewable energy (Green Hydrogen) surplus solar power is used to electrolyze water into hydrogen and oxygen. The global emphasis is on substituting liquid fuels with hydrogen (as fuel in vehicles), storage of surplus renewable power as hydrogen (as power cannot be stored at a cost effective price), and cutting down emission.

Coal is one of the important sources of hydrogen making (Brown Hydrogen).

However, Coal has not been encouraged elsewhere because of the fear that while extracting hydrogen via coal (from the moisture embedded in coal) there may be carbon emission. Almost 100% of Hydrogen produced in India is through Natural Gas.

Globally, 73 MT Hydrogen is used for refining, ammonia making and other pure use and about 42 MT is used for Methanol, steel making and other mixed uses. Cost of Hydrogen produced from coal can be cheaper and less sensitive to imports when compared with hydrogen production through electrolysis and Natural Gas respectively.

Production of hydrogen from coal will have challenges in terms of high emissions and CCUS will play an important role. However, when the carbon monoxide and carbon dioxide formed during coal to hydrogen process are trapped and stored in an environmentally sustainable manner (CCS and CCUS), then, Indian coal reserves could become a great source of hydrogen.

In steel making, lots of work has been done on production of steel by use of Hydrogen. However, iron reduction through hydrogen is an endothermic reaction and will require lot of heat. This heat can be generated in DRI plants due to presence of CO in syn Gas being produced from coal gasification process.

In light of the above, Ministry of Coal has constituted 2 Committees today, one to oversee the program and another of experts to give guidance to the Ministry. This is aimed for contributing to PM's agenda

of a hydrogen-based economy in a clean manner.

Task Force constituted under the Chairmanship of Shri Vinod Kumar Tiwari, Additional Secretary Coal has the following members:

1. Shri R.K. Malhotra, Director General (FIPI)/ Former Chairman & Director (R&D) IOCL
2. Project Adviser, MoC
3. JS level officers from MNRE, P&NG, Steel, Chemical and Fertiliser
4. Director level officer from CIL, NLCIL, IOCL, CMPDI, SAIL
5. Director (Tech.) MoC/CM Shri Peeyush Kumar - Member Secretary

The broad terms of reference of Task Force are as under:

1. Identification of role to be played by each stakeholder Ministry.
2. Coordination with Stakeholder Ministries.
3. Monitoring of activities towards achieving coal based Hydrogen production and usage.
4. Setting up sub committees to achieve the objective.
5. To coordinate with Coal Gasification Mission and NITI Aayog.

Further, the Expert Committee under the chairmanship of Shri R.K. Malhotra, Director General (FIPI)/ Former Chairman & Director (R&D) IOCL will have following members:

1. Dr Mukesh Kumar, Director, Steel Research Technology Mission of India
2. Prof K.K. Pant, IIT Delhi
3. Dr Anjan Ray, Indian Institute of Petroleum CSIR, Dehradun
4. Director, Engineers India Limited
5. Director(T) MoC/ Shri Peeyush Kumar, CM: Member Secretary

The broad terms of reference of Expert Committee is as follows:

1. Identifying experts in India and co-opting as members
2. Desk based review of progress in hydrogen technology and also review ongoing research projects in Hydrogen technology
3. Coordinate with various national/international technology institutions in hydrogen
4. Prepare a road map for coal based Hydrogen production and usage including

economic viability, environmental sustainability and policy enablers required

5. Identifying activities for implementation of coal based hydrogen production and usage

6. Assisting Task force in implementation of Coal based Hydrogen production and usage

The expert committee is expected to submit the report in three months.

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