



INTERNATIONAL COOPERATION

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1. Indo-Australia Collaboration

CMPDI has a Memorandum of Understanding (MoU) with Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australia signed on 12th June, 2013 for a period of five years for furthering scientific cooperation.

The MoU has been renewed for further ten years, signed on 16th November, 2018 at Brisbane (Australia) and exchanged on 22nd November, 2018 at Sydney (Australia) in presence of Hon'ble President of India, to encourage programs of exchange and collaboration in areas of mutual interest and benefit to both the organizations.

Status of On-going Research Projects-

- a. R&D project titled -Highwall Mining Feasibility Assessment and Layout Design jointly implemented by CMPDI, CIL and CSIRO, Australia. It was approved in June, 2022 under R&D funding of CIL for period of 2 years. Its cost is ₹ 4.93 Cr. Potential for highwall mining is explored in CIL Mines by CSIRO team.
- b. R&D project titled-Development of guidelines for prevention & mitigation of explosion hazard by risk assessment and determination of explosibility of Indian coal incorporating risk based mine emergency evacuation and re-entry protocol was jointly implemented by IIT-ISM, CIMFR, CIL, SIMTARS, Australia and NIER, University of New Castle, Australia. It was approved by Coal India Limited (CIL) in April, 2016 under R&D funding of CIL. Its cost is ₹ 24.13 Cr. The project got delayed due to delay in supplying of the equipment from Safety in Mines, Testing and Research Station (SIMTARS) and impact of COVID-19. Revised

project completion schedule as approved by R&D Board of CIL is 14th April, 2023.

- c. R&D Project titled-Development of Virtual Reality Mine Simulator (VRMS) for improving safety and productivity in coal mines is jointly implemented by IIT-ISM, CMPDI, ECL, NCL, and SIMTARS, Australia. It was approved in September, 2017 under R&D funding of CIL. Its cost is ₹ 14.10 Cr. IIT-ISM, Dhanbad will complete the project in-house within the approved cost which was agreed by the R&D Board of CIL in its 32nd meeting held on 28.07.2022. Project has also been extended up to 31st July 2023.

B. Areas of interest for India for sharing of technology by Australia:

- Coal Gasification/liquefaction: Proven Technologies in Australia may be transferred through Technology Transfer route to facilitate gasification (Surface & Underground) of High Ash Indian Coal. Four gasification projects of Coal India Limited at SECL, ECL, WCL and CCL/MCL are underway. Australian Companies may consider participating in these tenders.
- Coal based hydrogen
- Carbon Capture Utilization and Storage (CCUS): for minimising GHG emissions in coal gasification and producing blue hydrogen.
- Fire quenching: Cooperation in new mining technologies by Australian Organizations/ Universities in fire-affected areas for suppression & quenching of fire & extraction of locked coal by suitable mining technology.
- Development of guidelines for prevention

& mitigation of explosion hazard by risk assessment and determination of explosibility of Indian coal incorporating risk based mine emergency evacuation and re-entry protocol.

- Extraction technology for thick coal seams and mechanized underground mining like Underground mass production technology, Blast-Free Mining, Paste Fill Mining, Punch Longwall mining technology for open cast mining in environmental friendly and sustainable manner, and high capacity coal logistic solution. For thick seams occurring at higher depths, suitable underground methods of extraction (including LTCC - longwall top coal caving mining technology) needs to be developed.
- Mining methods for extraction of steep coal seams.

C. Possible avenues for Australia for investment in India:

- Solar energy production and storage, manufacturing of items for global solar value chain & other renewable energy projects: Coal India Limited (CIL) is looking to diversify into various business opportunities. As part of the diversification activities, CIL is actively pursuing multiple sustainable energy initiatives including solar power generation and solar PV manufacturing. CIL has already installed 8.294 MW of solar power plants and is planning to achieve solar generation capacity of 3 GW with the aim to achieve net zero status in the next few years. CIL is also planning to establish an integrated Solar PV Ingot-Wafer-Cell-Module manufacturing plant with module manufacturing capacity of 4 GW/ annum.
- Australian companies may join hand with Indian counterparts under R&D efforts for adoption of any new technologies in Indian

geo-mining conditions and marketing strategy & product transport, including smart mining with the application of Artificial Intelligence, Machine learning, Internet of Things etc. for enhancing production, productivity & Safety.

- Australian companies may collaborate through MDO mode in opencast and underground mining. Indian coal sector is open for Commercial Mining with 100% FDI. About 100 Coal and Lignite Blocks are on offer.

2. Indo-US Collaboration

A CMM/CBM Clearinghouse is functional at CMPDI, Ranchi under the aegis of Ministry of Coal and United States Environmental Protection Agency (USEPA) since 17th November, 2008. A Memorandum of Understanding was signed on 16th November, 2006 between Government of USA and Government of India in this regard. On completion of initial three years term it was extended thrice for another three years terms each. US EPA further extended grant support in 2018 for additional three years from 2018-2021. The website of the clearinghouse is <http://www.cmmclearinghouse.cmpdi.co.in>

International workshops/webinars were organized jointly by USEPA-GMI & CMPDI-CIL under aegis of Ministry of Coal in 2008, 2013, 2017, 2019 & 2020.

India is a member of Global Methane Initiative (GMI) and Climate and Clean Air Coalition (CCAC). India has been designated as Vice Chair for the Global Methane Initiative (GMI) Steering Committee for the period of 2021-23. Shri V.K. Tiwari, Additional Secretary, Ministry of Coal, GoI and Shri Manoj Kumar, CMD, CMPDI are designated as country representatives for Steering Committee of GMI. India has not signed the Global Methane Pledge (GMP) though it will continue to work on reducing emissions including methane within the overall ambit of its self-declared Net Zero Emission by 2070. India has been participating in the meeting and events organized by GMI and CCAC.

3. India-EU Collaboration

India is negotiating for the first time with European Union(EU) with the objective to facilitate trade and investment in areas of energy and raw material. EU has proposed Coal as an energy good under ENERGY AND RAW MATERIALS document.

4. MOUs/JWGs with Ministry of Coal-

- (i). Ministry of Coal has signed MoU with Poland on 04.02.2019 on cooperation in the area of coal mining.
- (ii). Ministry of Coal has Co-chaired the following JWGs:
 - (a). 5th Joint Working Group (JWG) on Coal between India and Indonesia held on 5th November 2020 through Video conference in New Delhi. This was co-chaired by Shri Vinod Kumar Tiwari, Additional Secretary, Ministry of Coal from the Indian side and by Mr. Jonson

Pakpahan, Director for Mineral and Coal, Non Tax State Revenue of Ministry of Energy and Mineral Resources, Republic of Indonesia.

- (b). The first Joint Working Group (JWG) meeting on “Coal and Mines” between India and Australia was held virtually on 23rd September, 2021 in New Delhi. This was co-chaired by Shri Vinod Kumar Tiwari, Additional Secretary, Ministry of Coal from Indian side and by Mr. Paul Trotman, Head of Resources Division from the Australian side.
- (c). 2nd India-Poland JWG on Coal and Energy was signed on 23.11.2017. The Indian side was led by Mr. Rajesh Kumar Sinha, then Joint Secretary, Ministry of Coal. The Polish side was led by Ms. Anna Margis, Joint Secretary, Ministry of Energy.



First Joint Working Group meeting on “Coal and Mines” between India and Australia held virtually on 23rd September, 2021 in the Ministry of Coal, New Delhi.

