



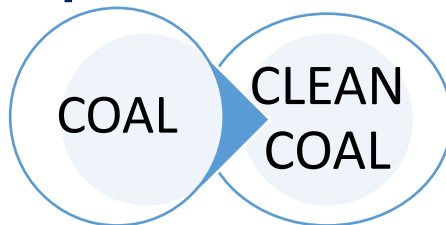
Coal Gasification

Webinar on “Energy for sustainable growth”

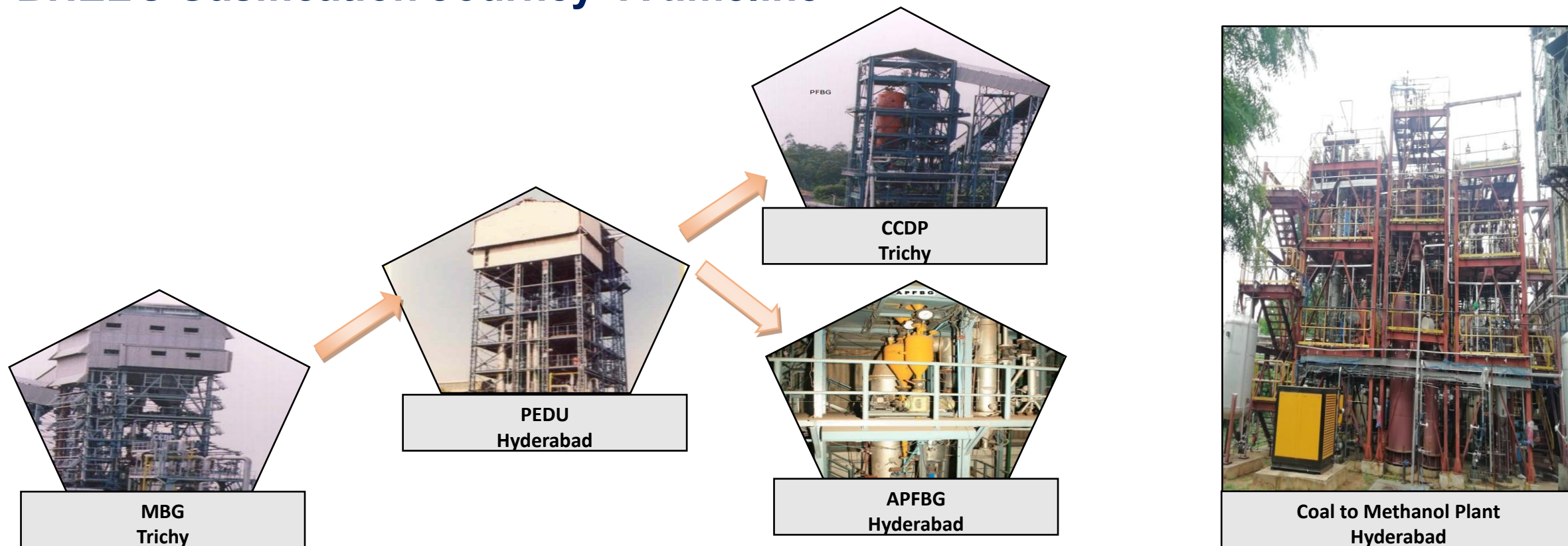
4th March 2022

Coal for Sustainable Growth

- BHEL's contribution to the thermal power sector in past six decades made the nation self reliant. More than 53% of the established domestic thermal capacity based on state of the art technologies established by BHEL.
- Environmental concerns leading to energy transition on a massive scale.
- Reserves of >300 Billion tonnes of coal, yet depending on expensive imported natural gas for fertilisers and chemicals
- **The new imperative for self reliance:**



BHEL's Gasification Journey- A timeline



1988-92	1992-96	1997	2000	2021
Moving Bed Gasifier (MBG)	Process Equipment Development Unit (PEDU)	Combined Cycle Demo Plant (CCDP)	Advanced Pressurised Fluidised Bed Gasifier (APFBG)	Coal to Methanol Plant
150 TPD	18 TPD	168 TPD	1.2 TPD	0.25 TPD
First Experience	Process development (Fluidized Bed)	Upscaling	Flexible Test Rig Multiple fuel firing (Lignite, Biomass)	First Indigenous Methanol Plant

Panoramic View OF 6.2 MW PFBG Plant at BHEL, Trichy



Gasifier operational experience of more than 10,000 hours.

Design for 125/182MW IGCC available


Scale-up vetted by National level R&D committee

BHEL Coal to Methanol Pilot Plant

Nation takes note of
India's first indigenous
Coal to Methanol Plant,
developed by BHEL
(A Govt. of India initiative)



**Padma Bhushan
Dr. Vijay Kumar Saraswat**
Member, NITI Aayog; Chancellor, JNU
Distinguished Scientist



Dr V K Saraswat @DrVKSaraswat49
Extremely happy to witness India's First Indigenously developed 0.25 TPD #Coal2Methanol Plant producing methanol with purity 99.2% at @BHEL_India R&D Hyderabad. The project was funded by @IndiaDST on the initiative of @NITIAayog. @PMOIndia @CoalMinistry

7:01 PM · Sep 7, 2021 · Twitter Web App



BHEL developed Coal Gasification facility at Hyderabad

Particulars

Capacity: 1.2 TPD Coal

Output: 0.25 TPD Methanol (Grade A/AA)

Cost: Approx. Rs 10 Crore (DST funded)

Technology: Fluidized bed gasifier (Oxy blown)

Location: IICT, Hyderabad

Readiness for Commercialization of Gasifier Island

- PFB Gasifier Island Process Flow Finalisation
- Detailing of equipment/ system data sheets
- Gasifier mechanical design in accordance with ASME code
- Process design of Cyclone & Loop Seal & Heat Recovery System
- Lock Hopper sizing for coal feeding and ash extraction system
- Refractory design detailing for the Gasifier
- Critical BOIs (coal feeders, air separation unit, etc.) and related supply chains

Delivering The Complete Solution With Extensive In-house Capabilities

GASIFIER ISLAND

SYNGAS CLEANING &
CONDITIONING ISLAND

END PRODUCT ISLAND

Proven Expertise and Capability for In-house Engineering and Manufacturing

- Process and Equipment Design (Corporate R&D and HPBP Trichy)
- Plant level Integration (PEM Noida)
- End-to-end Gasification Island – gasifier, coal and ash handling, syngas cooler, auxiliary boiler (Trichy, ISG Bengaluru)
- In-house Manufacturing of Critical equipment – gasifier, syngas cooler, reactors, absorption and distillation columns, compressors, pumps, piping, etc. (Trichy, HPVP Vizag)
- Plant Electricals, Control & Instrumentation (HEP Bhopal, EDN Bangalore)
- Civil and structural (Trichy and PEM)
- Site erection and commissioning (Power Sector Regions)

Road Ahead

- Working with country's Coal/ Lignite sector using BHEL's PFBG technology for mass scale production of chemicals
- To continue with R&D advancements in development of clean coal technologies –
 - hydrogen
 - power generation
 - carbon capture
 - steel production process, etc.
- Offer customized solutions

Brief Particulars of BHEL PFB Gasifier

Suited for High Ash Indian Coal (35% - 45% Ash)

Coal Throughput: ~2600 TPD

Temperature: ~950 deg C

Pressure: ~30Bar

Oxy-blown Technology

Syngas Generation [Single train mode] equivalent to

- 750 TPD Methanol

- 2000 TPD Ammonium Nitrate

BHEL fully geared up for AatmaNirbharta in Coal Gasification