

Indo-German Energy Forum (IGEF)

Sub Group 1: Efficiency enhancement in fossil fuel based power plants

# IGEF & NTPC

## Identifying potential areas of Co-operation



**A Presentation by NTPC Ltd.**

13.02.2015, New Delhi

# USC Technology deployment status

- SC technology established through Sipat-I and Barh-II supercritical units. Many other super critical units in advanced stages of execution
- Ultra supercritical technology with steam parameters of 269 kg/cm<sup>2</sup> (Press.) 596 °C/ 596 °C (temp) introduced in North Karanpura Project.
- Many Units in the temperature range of 600 °C are in different stages of tendering process.
- New high grade materials proposed to be introduced for enabling high cycle parameters
- 1000 MW USC unit with imported coal firing under planning.



# Indian Adv-USC Program



## Adv-USC

- Collaboration between NTPC, BHEL and IGCAR
- Objective: 800 MWe Adv-USC Plant having 310 ksc pr/ 710°C MS/ 720°C RH Temp
- No global reference at present
- Target efficiency of 46% as against 38% in sub-critical plants resulting in 17% reduction in carbon emissions
- Time schedule 7 years (2½ R&D & 4½ yrs plant Const.)
- Project Outlay
  - R&D cost~ Rs. 1500 cr\*
  - Demo plant- App. Rs 8000 cr

## Status Update

- Test loops utilizing indigenously developed advanced materials, to be deployed for high temp applications, shall be installed at NTPC, Dadri in 2015 for hot corrosion tests
- Plant Design Memorandum (PDM) finalized
- Pre-project R&D initiated for the following
  - ✓ Development of Boilers with Advanced High Temperature Materials
  - ✓ Design & Devpt. of turbine blade profiles for HPT
  - ✓ Development and Characterization of Dissimilar Metal Weld Joints between Alloy 617M and 10% Chromium Steel for Turbine Rotor Application
  - ✓ Development of high pressure bypass valves for AUSC
  - ✓ Fabrication of mock-up thick walled superheater header
  - ✓ Many other component development programme in progress

# IGEF & NTPC: Potential Cooperation areas

## USC Technology

Induction of USC technology, though commercially established globally, is in nascent stage in India. Therefore, cooperation in following areas will be useful:

- Experience sharing w.r.t.
  - Plant design considerations
  - Metallurgy/material selection
  - Water chemistry etc.
- Interaction/ feedback from plant operators in respect of :
  - teething problems during commissioning and plant stabilization
  - Trouble shooting
  - Operating feedback/plant visits etc

## AUSC Technology

- Co-operation on qualification, testing and welding of advanced materials for high temperature applications (particularly for water walls)
- Feedback and lessons from AD-700 & other similar programs including interaction with concerned experts.
- Feedback on planning/operation of any test loop on Advanced materials

THANK YOU