

# Low-Emissions Coal Technologies

Sharad Anand  
18<sup>th</sup> November 2015  
IEEJ, Tokyo

# Fossil Fuel – Main Stay of Energy

- ❖ World Energy demand – 82% in 2030, 64% in 2050
- ❖ World Coal Demand - +60+ from 2006 to 2030
- ❖ Reserve Energy Resource – 144 Years
- ❖ Equitable distribution of fuel reserve and energy security
- ❖ Emission reduction potential : 1.8-2.5 Gt/yr by applying BAT to fossil power

# Key Technologies and Best practices

- ❖ Supercritical and ultra Supercritical technologies
- ❖ Integrated Coal Gasification Combined Cycle (IGCC)
- ❖ Advanced Ultra Supercritical Technology
- ❖ Renovation and Modernization Technologies for existing power station
- ❖ Waste Heat Recovery from the power plants
- ❖ Development and Deployment of other innovative high efficiency cycles  
Ex: Ammonia and Organic Rankine Cycle

Average efficiency in coal-fired power plants in MEF countries from 31%  
to 42%

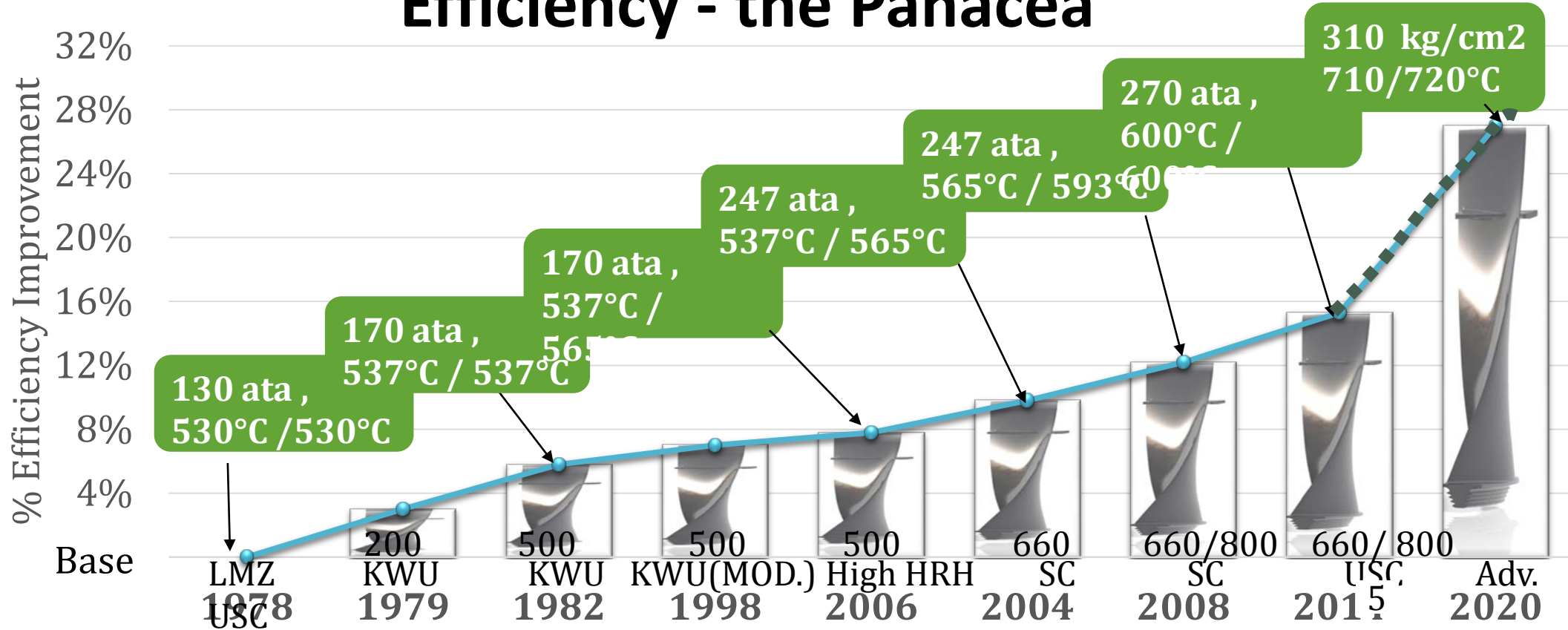
# Barriers

- ❖ Insufficient information
- ❖ Varying qualities of coal
- ❖ High upfront cost of advanced high efficiency and lower emissions coal technologies
- ❖ Lack of appropriate price/financial/regulatory incentives (domestic and international)
- ❖ Inadequate Operation and Maintenance (O&M) skill
- ❖ Insufficient R&D efforts

# Actions and Recommendations

- ❖ Identification and information sharing of Next Available Technology (BAT) options and Best Practices (BP)
- ❖ Nationally Appropriate Technology Deployment roadmaps
- ❖ Appropriate price/financial/regulatory incentives for the uptake of BAT and BP
- ❖ Cooperation with private sectors
- ❖ Technology transfer mechanism enabling effective matching between technology owners and financial sources
- ❖ Capacity building efforts (domestic and international initiative)
- ❖ Technology R&D roadmaps (domestic and international sharing)
- ❖ Enhancement of R&D efforts and international R&D collaboration including public and private partnership (Ex: nationally appropriated R&D goals, demonstration projects in overseas)
- ❖ Identification and utilization of on-going international initiatives (Ex: APP, IEA Implementing Agreement)
- ❖ Information sharing with other MEF initiatives

# Efficiency - the Panacea



## Established Interventions

- Steam Condition Improvements (Upto USC)
- Lower Steam Generator Exit Temperature (Upto 125<sup>0</sup> C)
- Cycle Configuration Improvements (Series condenser, HARP, Over load valve)
- Flue Gas Heat Utilisation for Air Conditioning

## Proposed Interventions

- Steam Parameter Improvements (Advance USC)
- Condensate Pre-heating
- Excess Air Reduction (Like 15%)
- Innovative Cycle Solutions
- Cold End Optimization
- Low Grade Heat Utilisation

THANK YOU