Indo-German Energy Programme (IGEN)

Ebsilon Software in TPPs and Outcome

19.02.2018

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Content

- **Motivation**
  IGEN cooperation on coal fired power plants

- **Approach**
  Activities in the power plant optimization component

- **Impact**
  Success stories and lessons learnt

Indian Power Sector (in 2013)

- Nearly 75% of the total generation cost is cost of coal
- 62 % share of coal fired thermal power plants in India
- India Third largest user of coal in world. 71% of total coal was used in thermal power plants (nearly 500 Million tonnes / annum)
- 8 GW coal fired thermal power plants added per year during 11th five year plan (2007-12)
- 17.7 GW coal fired Thermal power plants added per year till 3rd year of 12th five year plan

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IGEN- I (2006-2009)

- Power Plant Optimization Component
- Jointly implemented by Central Electricity Authority (CEA) and Steag Energy Services
- Identification of savings potential
- 85 Thermal Power Generating units studied
- Mapping done through Ebsilon Software
- Measures suggested by the plant personnel and the experts
- 6.92 million tonnes of coal savings potential identified per year
- Equivalent to 10 million tonnes of CO_2 per year

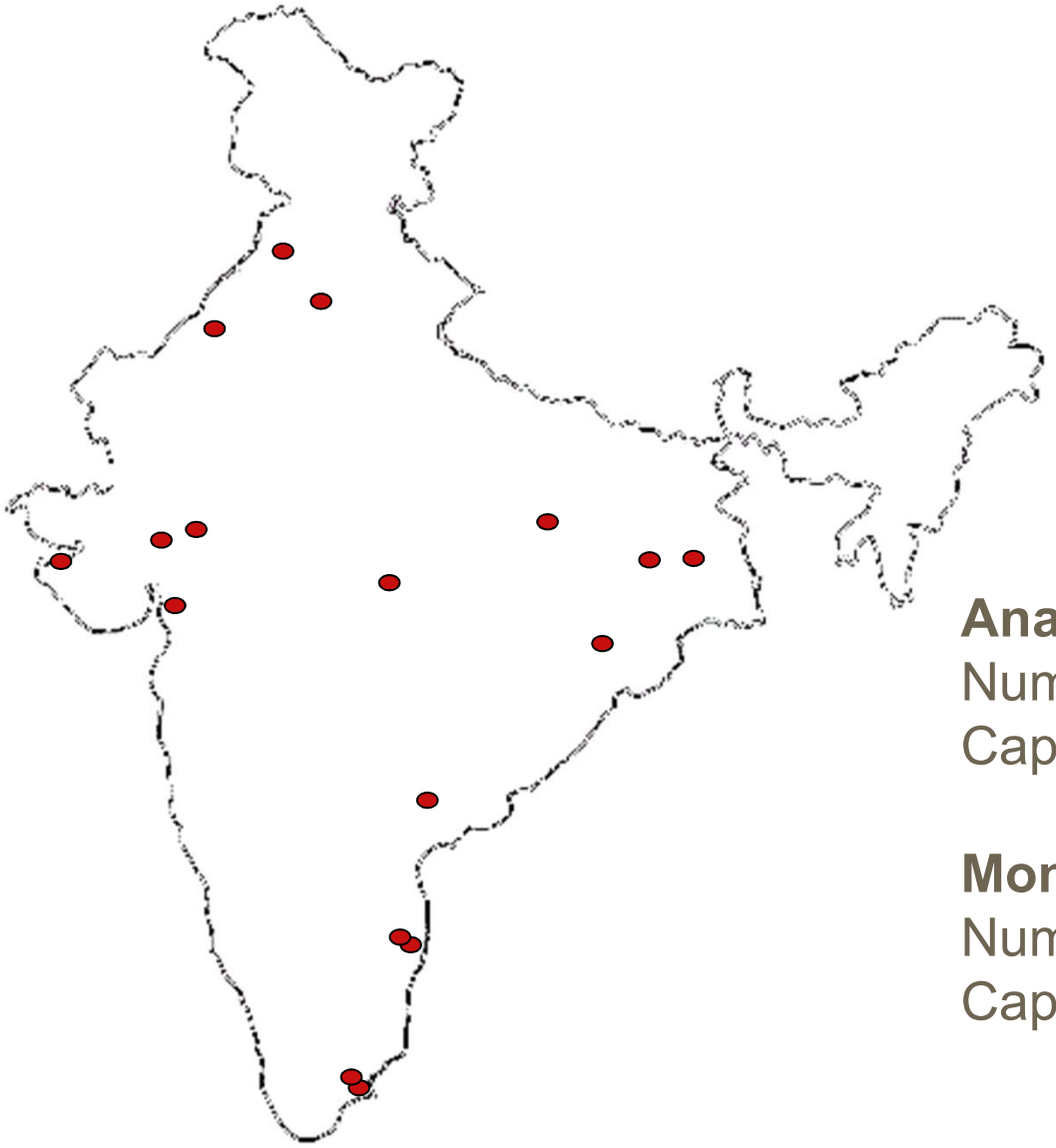
IGEN- II (2009-2015)

- **Jointly implemented by Central Electricity Authority (CEA)**
- **Objective**
  - **Training and capacity development of plants engineers with diagnostic software and study tours**
  - **Feasibility studies to identify savings measures in plant. Implementation of exemplary saving measures in three selected plants**
  - **Implementation of a demonstration boiler performance optimization system (BPOS)**

Trainings and Support

- Distribution of 40 Ebsilon Licenses to 15 state and central utilities
- Training to 101 engineers on the use of a powerful diagnostic tool (Ebsilon®)
- Continuous technical support
- Study tour on best operational practices with 53 engineers to German coal fired power plants
- Distribution of additional 15 Ebsilon licenses to the utilities. Total of 55 licenses distributed)

Feasibility Study- Case studies



Analysis

Number of units : 17

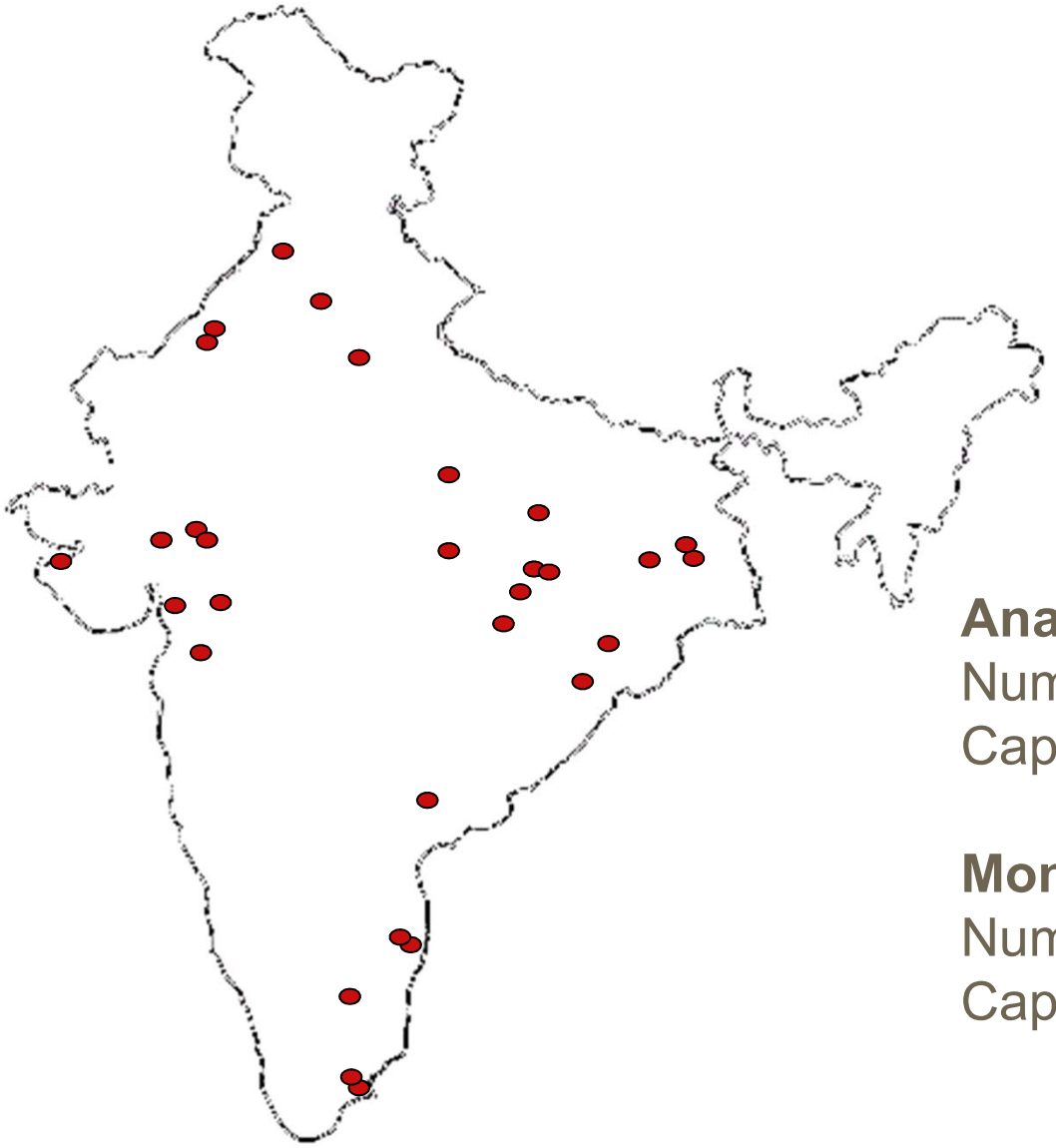
Capacity : 3.6 GW

Monitoring

Number of units : 8

Capacity : 1.9 GW

Feasibility Study- Mapping reports



Analysis

Number of units : 30

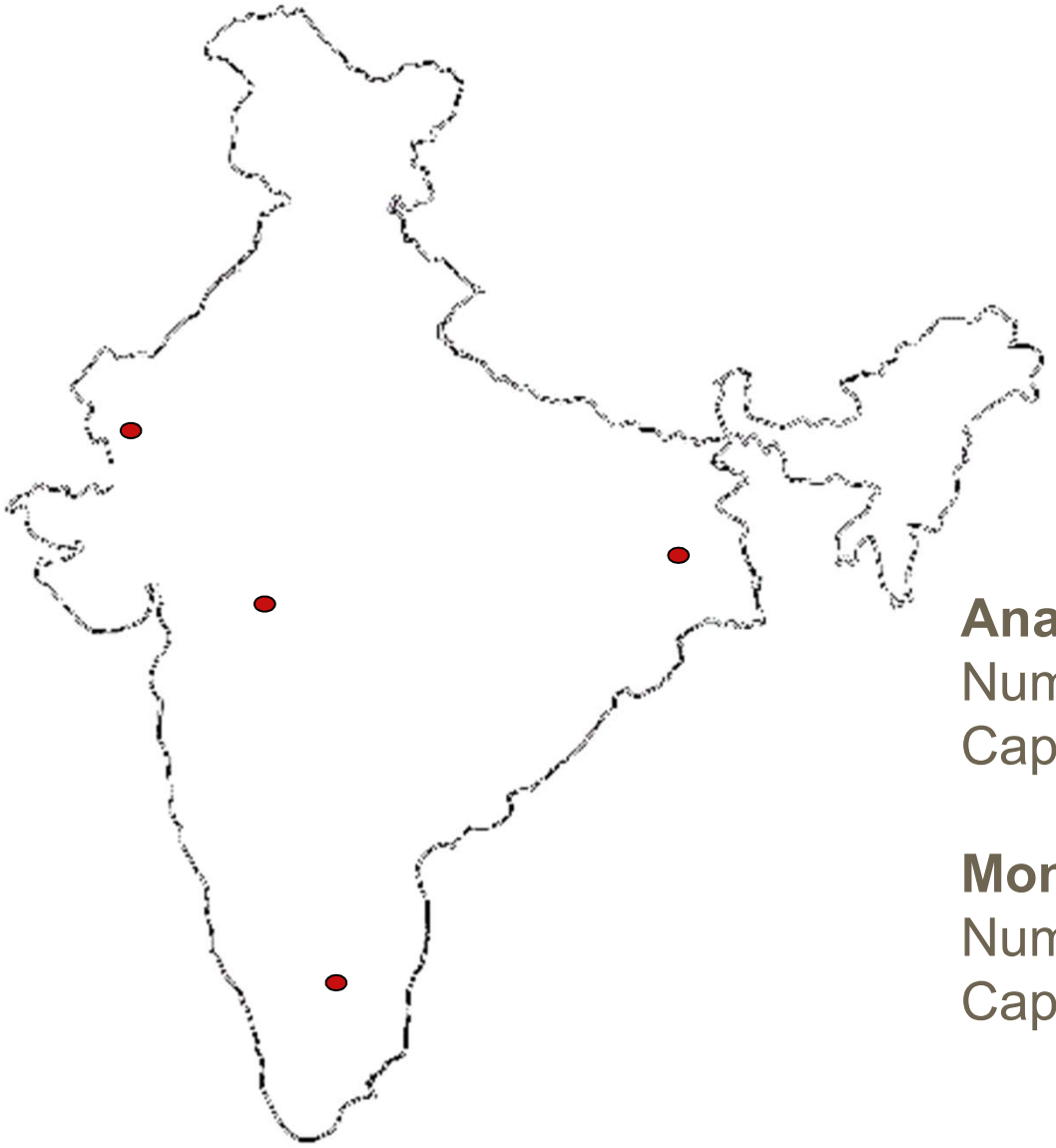
Capacity : 7.5 GW

Monitoring

Number of units : 15

Capacity : 3.5 GW

Implementation of saving measures-Model Power Plants



Analysis

Number of units : 4

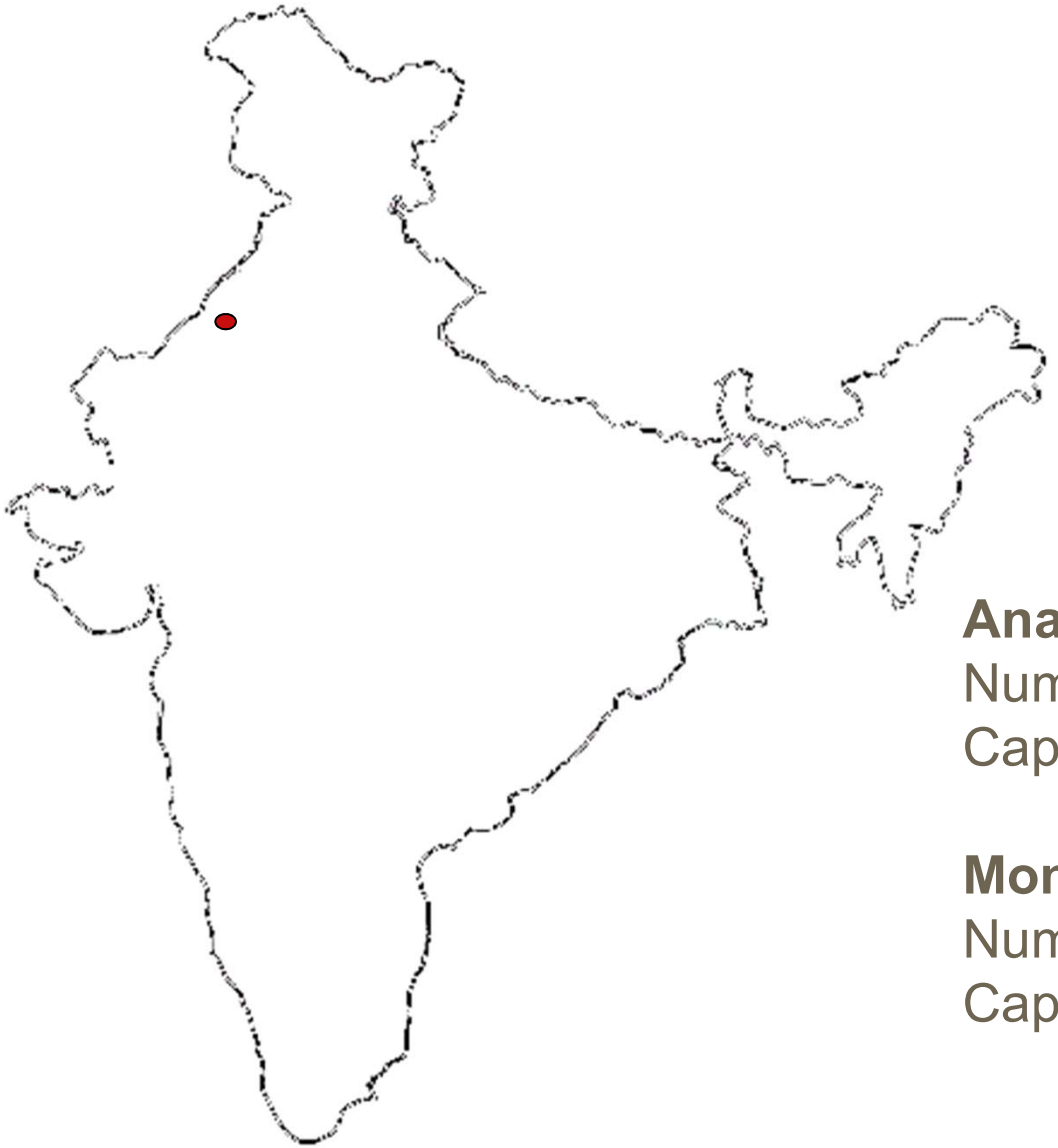
Capacity : 1 GW

Monitoring

Number of units : 3

Capacity : 0.92 GW

Boiler Performance Optimization System



Analysis

Number of units : 1

Capacity : 0.25 GW

Monitoring

Number of units : 1

Capacity : 0.25 GW

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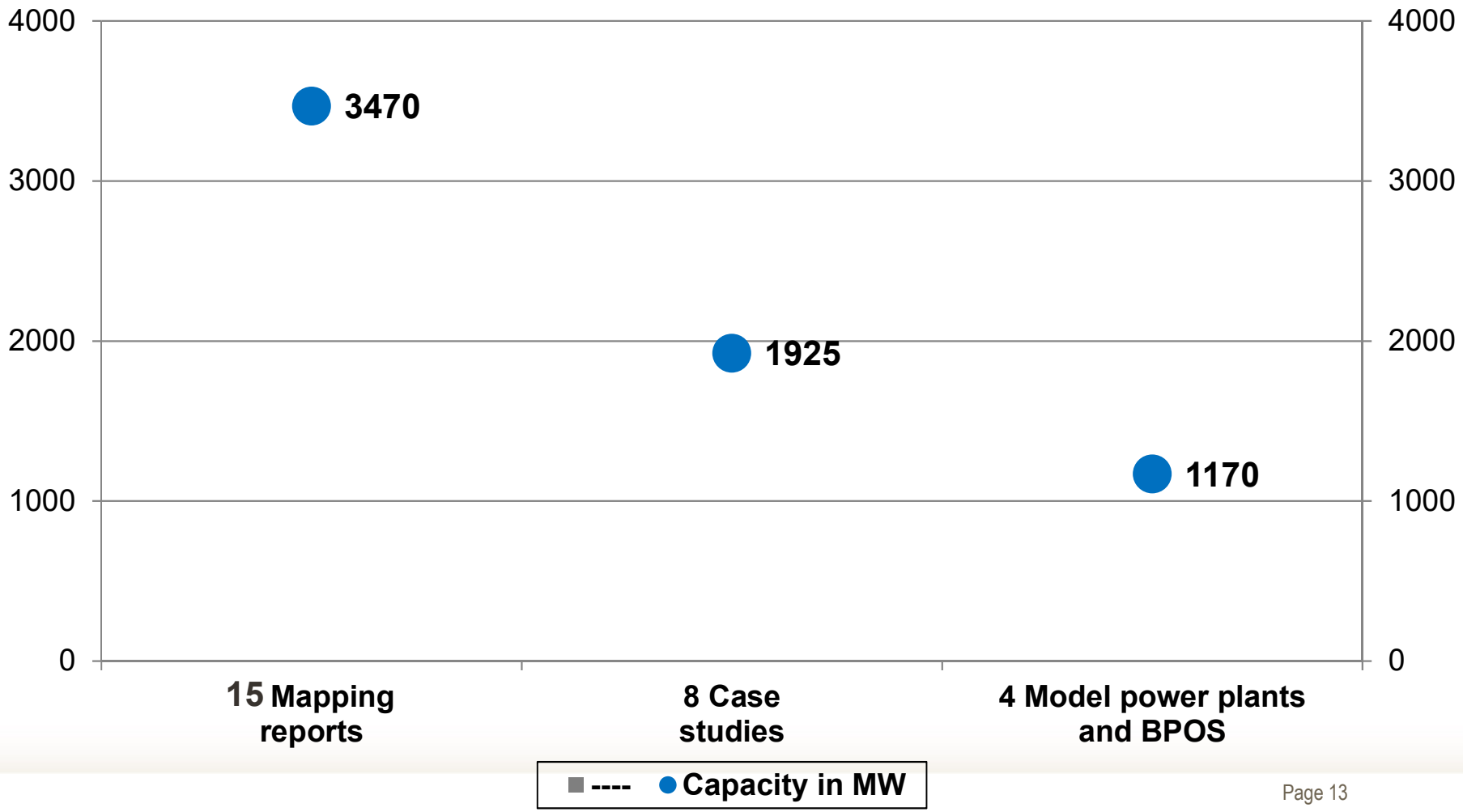
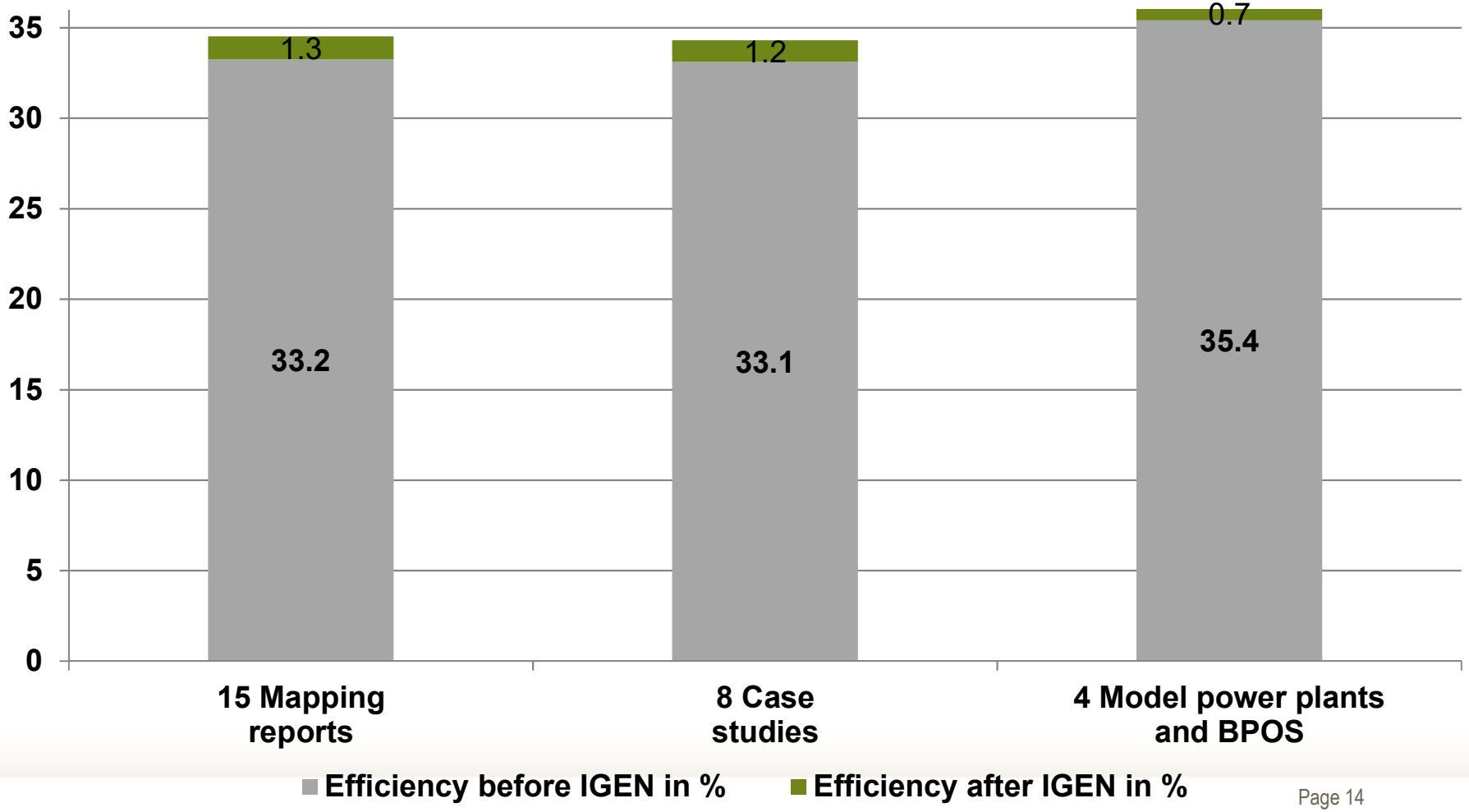
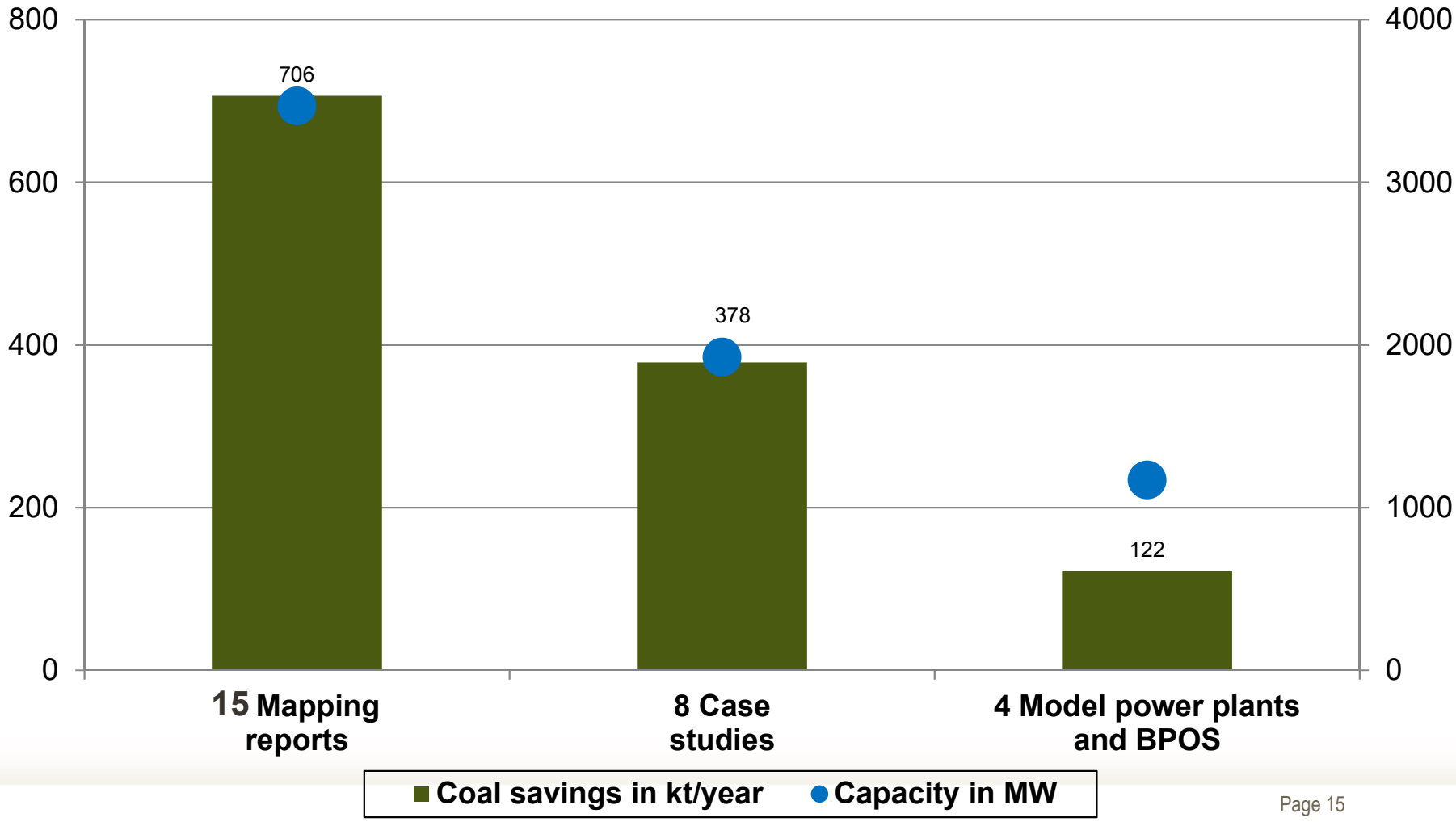
Working Areas and Plant Capacities



Efficiency Improvements



Coal Savings



Summary of Savings

- Average efficiency
  - before 33.6 %
  - after 34.7 %
- Savings of coal
  - 1.2 Million tons / year
- Savings of CO2
  - 1.6 Million tons / year

Learnings and way forward

- The first step to reduce to energy consumption is to measure it
- Divide the savings measures in short term and long term so that it could be planned accordingly
- India's share of coal fired thermal power plants currently is 58%
- Merit Order Dispatch

Thank You

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