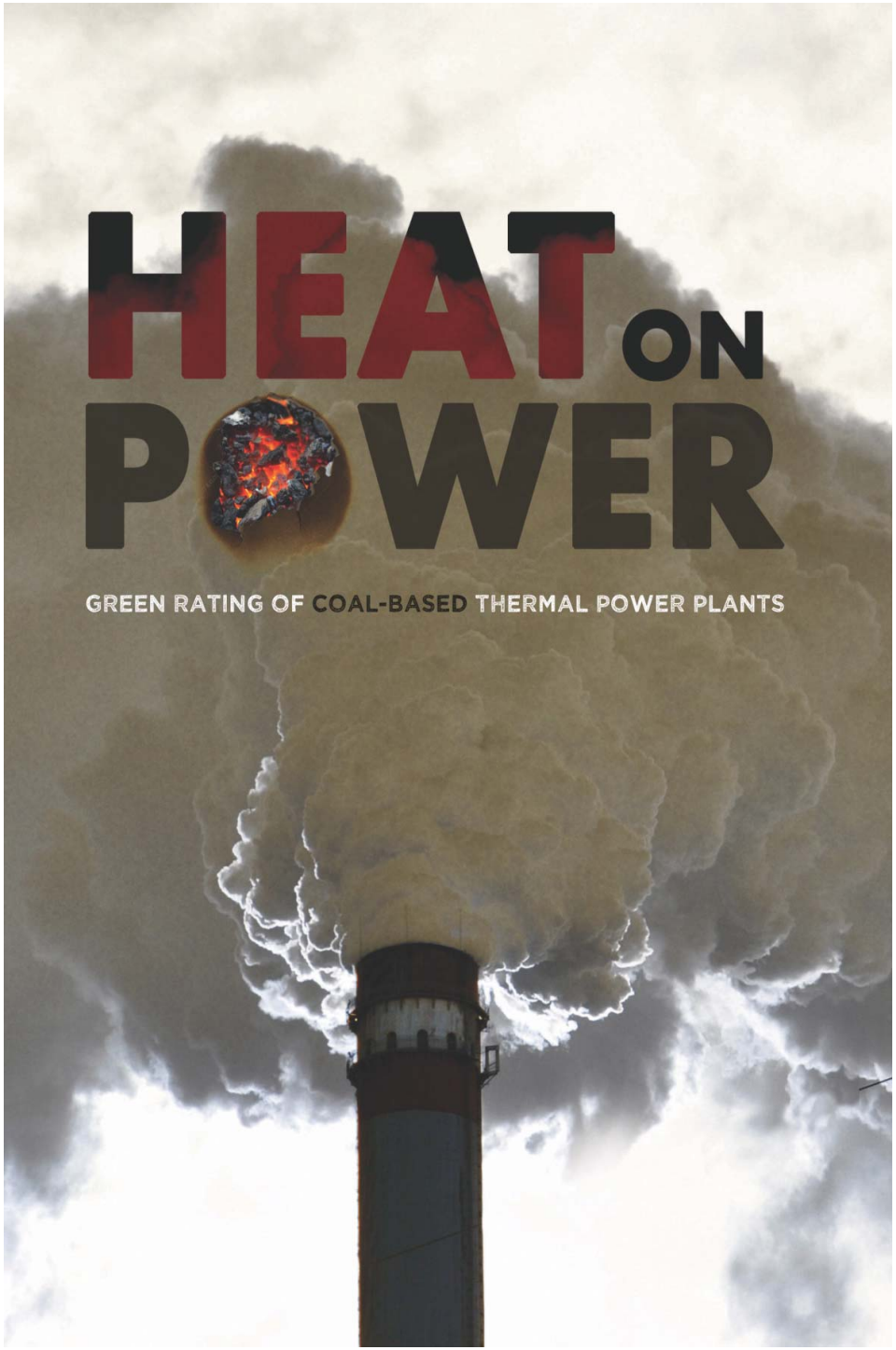


CSE

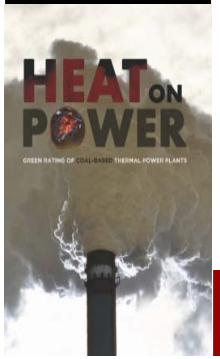
THE FIVE LEAVES AWARD

Green Rating Project

What, why, How?

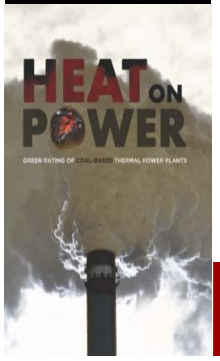
CSE's Green Rating Project - what and why?

- ✓ Started in 1997; Rated 6 sectors:
  1. Pulp and Paper 1999, revisited 2004, 2013
  2. Automobile, 2001
  3. Chlor-alkali, 2002
  4. Cement, 2005
  5. Iron and steel, 2012
  6. Thermal power, 2014



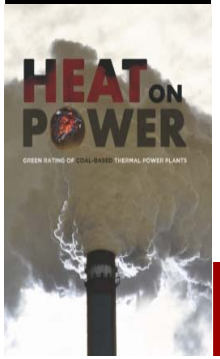
Coal thermal power

- ✓ Core industrial sector; set to expand
  - Resource intensive – water, coal and land
  - High pollution potential
  - half the country's GHG emissions
- ✓ Difficult issue; would like it to go but recognize that it will stay for countries like India.
- ✓ So even as we push for renewables the question is how to clean coal thermal power- How?



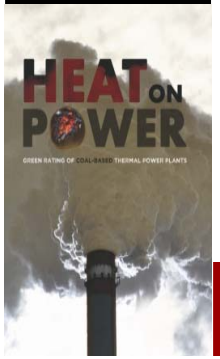
Research: Design & Coverage

- ✓ Sample: geographically diversified, State, centre and private ones, wide unit sizes and age
  - ✓ Sample size: 47 plants, 54 GW; Over half the sector's capacity; Just under half participated; non-participating was also rated
- ✓ Extensive questionnaire
- ✓ Site surveys- plant, community, NGOs, media, PCBs,
- ✓ Photograph, Sample tests
- ✓ 2 years of rigorous assessment; 60 key parameters



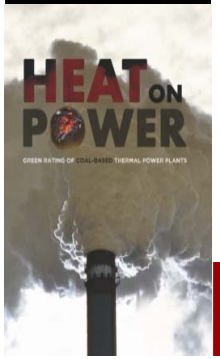
What we found ?

- Top performers- scored 45-50%
  1. CESC-Budge Budge (West Bengal)
  2. JSWEL-Toranagallu (Karnataka),
  3. Tata-Trombay (Maharashtra) JSW-Ratnagiri (Maharashtra).
     * Tata-Mundra (Gujarat)- highest energy efficiency
     * GIPCL- Surat- lowest water use
- Average score- 23%
- 40% plants- <20% score (no award)
- Inefficient resources use and technological backwardness leading to high levels of pollution



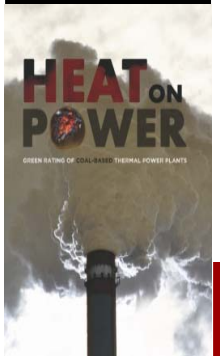
What we found ?

- ✓ Among the least efficient in the world
  - Average 32.8%, Aus- 33.3%, China-35.7%, US- 35.8%
  - 14 plants <32%- almost all state-owned, JSEB-Patratu 21%
  - 12 plants efficiency in excess of 36%, around Chinese avg.
- ✓ Subcritical 90%, SC 10% ; USC not even introduced
  - China subcritical 75%, SC/USC – 25%
  - <10 years and >300MW – less than 1/5th in India; while above 60% in China
- ✓ Over half of GHG emissions – avg 1.08 tCO_2/MWh
  - 45% higher than the global best; 14% higher than Chinese average



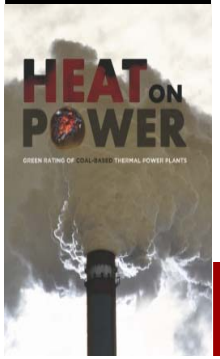
What we found ?

- ✓ Needs 22 BCM water; >50% India's domestic need
  - OTC plants: <20% electricity takes 90% water- almost all state owned
  - CT plants need 4 m^3/MWh; China average 2.5 m^3/MWh.
- ✓ 55% units- exceed air pollution norms
  - (already lax PM norm- 50-350 mg/Nm^3); Chinese norm-30mg/Nm^3
- ✓ >76% plants failed to meet the MoEF&CC's ash utilisation target
  - Only 50-60% of the 170 MTPA used
  - About a billion tonne dumped in these ponds, pollute land, air and water. 300 MTPA will be produced by 2021-22



What we found ?

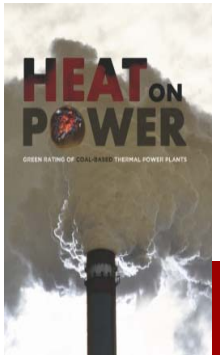
- ✓ 20 plants were discharging ash slurry into water bodies, a serious violation
- ✓ Effluent samples taken by CSE show 39% violated TSS norm
- ✓ 60% plants do not have ETP and STP
- ✓ NTPC Ltd.- Non-participating
  - The largest coal-power producing company in India: was found below par
  - The six plants received scores of 16-28%
  - Worst was Delhi's Badarpur plant



CSE

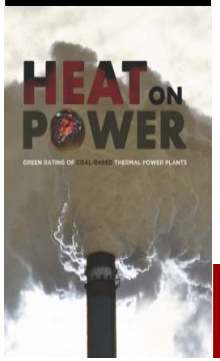
THE FIVE LEAVES AWARD

How does your state perform?



Chhattisgarh

- ✓ Capacity- 9GW; 30 in pipeline. 4 plants (above 60% capacity) assessed
  - O.P. Jindal Power plant, Tamnar (participated); score 39%
  - CSPGCL- Hasdeo thermal power plant (participated) score 15%
  - NTPC- Sipat ; score 28%
  - Lanco- Amarkantak thermal power station; score 22%
- ✓ Korba- a critically polluted area has high conc. of power plants, mostly polluting, extremely poor ambient air quality
- ✓ None of the plants in state had-
  - SO_2, NOx emission control
  - full compliance to the norms
  - met ash utilisation norms of MoEF&CC
- ✓ Social issues: Land acquisition, rehabilitation, compensation
  - JPL has multiple complaints on irregularity in land acquisition, public hearing

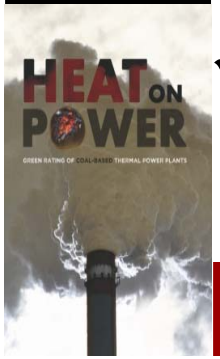


CSEB- Hasdeo- Air pollution

JPL-Tamnar- Air pollution

Jharkhand

- ✓ Around 4.5 GW capacity. GRP assessed 5 plants (around 75% of the state capacity):
  1. JSEB- Patratu thermal power station; score 6%
  2. Tenughat Vidyut Nigam Limited, Lalpania (participated); score 9%
  3. Maithon Power Limited- Maithon; score 22%
  4. Tata- Jojobera thermal power station (participated); score 37%
  5. DVC- Bokaro Thermal Power station ; score 8%
- ✓ All state govt. owned: smaller size, outdated units, poor performer, highly polluting (JSEB-Patratu was worst)
- ✓ None complied fully to: the pollution norms, ash utilisation norms
- ✓ Except Tata-Jojobera, all sources enormous water from dams
- ✓ Social issues: Land acquisition, rehabilitation, compensation
  - TVNL-Tenughat and JSEB- Patratu have severe land community issues



JSEB- Patratu- water pollution

Oil laden effluent released from discarded slurry pipeline

Effluent going to the river

JSEB- Patratu- water pollution

Ash slurry discharge in the river


TVNL, Lalpania- Air pollution

TVNL, Lalpania- Water pollution

Ash slurry discharge from ash pond

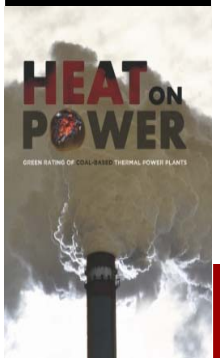
Katel river filled with ash

Odisha

- ✓ Around 7.7 GW. GRP assessed 2 plants, capturing around 45% of the state capacity. None agreed to participate
  1. OPGCL-Ib valley thermal power station; score 23%
  2. NTPC- Talcher thermal power station, Kaniha; score 24%

- ✓ Poor environment performance –high air and water pollution in both plants. Ambient air was very polluted

- ✓ None of the plants had-
  - SO_2, NOx emission control
  - full compliance to the norms
  - met ash utilisation norms of MoEF&CC
- ✓ Pollution related health issues, inadequate CSR are common issues

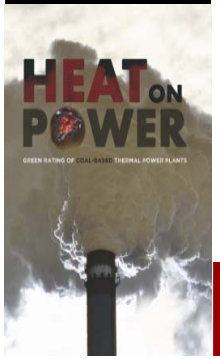



NTPC- Talcher Kaniha - stack emission during night

OPGCL- Ib valley air pollution

Bihar

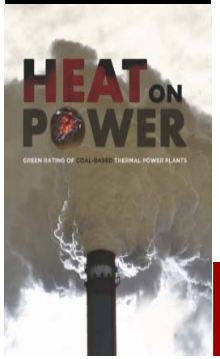
- Around 3 GW. GRP assessed only plant-
  1. NTPC- Kahalgaon super thermal power station; score 26%
- Not agreed to participate
- No SO_2, NOx emission control
- Not full compliance to the norms
- Not met ash utilisation norms of MoEF&CC
- Poor ambient air quality was noted
- Land acquisition, rehabilitation & compensation- common issues



Madhya Pradesh

- Around 9 GW. GRP assessed only plant-
  1. MPPGCL- Birsinghpur thermal power station; score 23% (Participated)

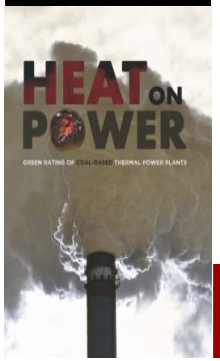
- No SO_2, NOx emission control
- Not full compliance to the norms
- Not met ash utilisation norms of MoEF&CC
- High water consumption- an OTC plant
- High water and air pollution
- Social issues- damage of road, ash spillage and fugitive emission on road, drop in crop yield due to ash and lack of CSR



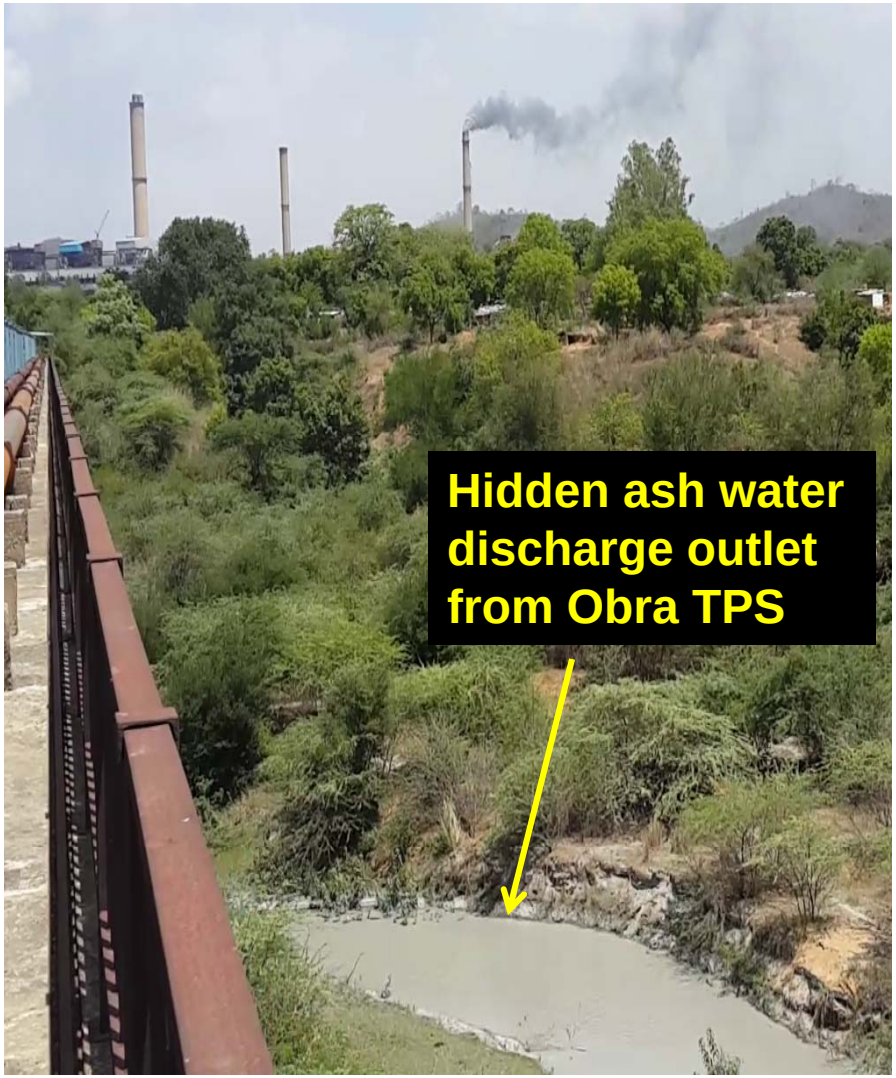
MPPGCL- Birsinghpur- air pollution

Uttar Pradesh

- Around 17 GW. GRP assessed 3 plants-
  1. UPRVUNL- Anpara "A&B" thermal power plant; (participated); score 12%
  2. UPRVUNL- Obra thermal power plant; (participated); score 8%
  3. NTPC- Singrauli super thermal power plant; score 21%.
  4. Reliance- Rosa thermal power plant; score 30%
- Except Reliance-Rosa, all three plants are from an identified critically polluted area
  - OTC type high water consuming and infamously polluting,
  - Discharging ash into dam
- Sonebhadra region- many power plants and coal mines
  - CSE's lab study found mercury contamination in water, soil, fishes and local residents
- No SO_2, NOx emission control
- Not met ash utilisation norms of MoEF&CC



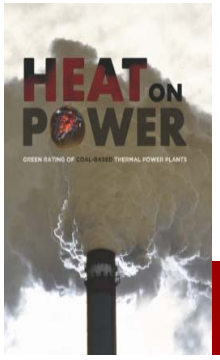
UPRVUNL- Obra- Water pollution



UPRVUNL- Anpara- Air pollution

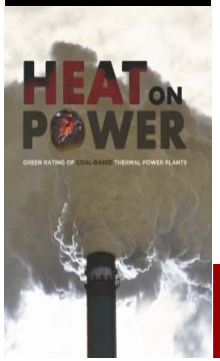
UPRVUNL- Obra- Air pollution

What is the way ahead?



Way ahead

- ✓ Only SC/USC plants to be allowed
  - Old inefficient plants to be scrapped at an aggressive pace
  - Regional carrying capacity assessment and tighter norms- critically polluted areas
- ✓ Clearances to ensure best technology, practices
  - Electricity demand 2X by 2021-22; per capita will remain half of global avg.
- ✓ Regulations/incentives to improve capacity utilisation
  - Most efficient stocks are less efficiently utilised- Tata Mundra, Adani Mundra, NTPC-Sipat ; 52-75% PLF
- ✓ Coal washing capacity- to be increased 2-3 times
- ✓ Water tariffs to increase to curb excessive use
- ✓ Power dispatch order- to ensure polluting plants not called first to supply power as they are the cheaper
  - pollution control costs only about 10% of the operating and capital costs



Way ahead

- ✓ Weak national norms: to be strengthen like global standards
  Formulate norms for SO_2, NOx and mercury
  - 60 % PM, 45-50% of SO_2 , 30% of NOx emissions of industrial sector comes from coal power
  - > 80 % of total mercury emissions
  - Pollution load can increase 2-3 time by 2021-22 (at current rate)
- ✓ Ash utilisation policy- target high use, individual plants to keep in mind
  - Ash generation will be double by 2021-22 (160-305MTPA)
- ✓ Regulators capacity building; monitoring to strengthen
- ✓ Massive surplus land with govt. plants; policy to use surplus
- ✓ 55 GW of coastal capacity expected to come up
  - Potential impacts on marine biodiversity to be investigated