People Lead; Investors Follow

"It's one thing for Dow Chemical to have problems in Taiwan or Thailand but to be frozen out of India, one of the most dynamic growth markets in the chemical industry, is really unacceptable."

Bennett Freeman, Director, Calvert Investments
Smart People; Stupid Things
Green for Investors:
Red for People

- Sambar Lake
- 4000 MW solar UMPP
- 23000 acres
- Lake Watershed
- Affected communities; workers
Cheyyur 4000 MW UMPP Case Study
UMPP – Ultra Mega Power Projects

- Policy of GoI
- Make it Attractive for Pvt Investors
- Economies of Scale
- Plug-and-Play – All clearances by SPV
- Bidding – Tariff-based
Existing UMPPs

- Tata Power – Mundra, Gujarat (5 x 800)
- Reliance Power – Sasan, MP. (5/6 x 660)
- Reliance Power, Krishnapatnam, AP (No progress)
- Reliance Power, Tilaiya, Jharkhand (Early development)
- 5 new UMPPs – Budget 2015
## Cheyyur Ultra Mega Power Plant Vital Statistics.

<table>
<thead>
<tr>
<th>Description</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity</td>
<td>4000 MW</td>
</tr>
<tr>
<td>Imported Coal</td>
<td>12-14 million tonnes/year</td>
</tr>
<tr>
<td></td>
<td>40,000 tonnes per day</td>
</tr>
<tr>
<td>Seawater Intake (Cooling/Freshwater)</td>
<td>864 mld</td>
</tr>
<tr>
<td>Effluents to Sea</td>
<td>533.5 mld</td>
</tr>
<tr>
<td></td>
<td>53,300 lorry loads/day</td>
</tr>
<tr>
<td>Total Ash Generated</td>
<td>5400 tpd</td>
</tr>
<tr>
<td></td>
<td>1.94 million tonnes/year</td>
</tr>
<tr>
<td>Land Requirements</td>
<td>Area</td>
</tr>
<tr>
<td>------------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>Main Plant</td>
<td>415.45 ha (incl. 342.6 ha agriculture)</td>
</tr>
<tr>
<td>Ash Pond</td>
<td>90 ha</td>
</tr>
<tr>
<td>Coal Conveyor</td>
<td>22 ha</td>
</tr>
<tr>
<td>Rail Corridor</td>
<td>55 ha</td>
</tr>
<tr>
<td>Captive Port</td>
<td>84 acres including 650 metres beachfront</td>
</tr>
</tbody>
</table>
Sand dunes; Beaches

- Storm mitigators
- Fresh water reservoirs
- Wind breakers
- Check salinity intrusion
- Agriculture – leeward side
Estuaries

- Mangroves and seagrass beds
- Breeding and feeding grounds for fish and birds
- Maintain hydrological balance and nutrients cycle
Inland Waterbodies

- Harvest rainwater
- Mitigate flooding
- Recharge groundwater
- Support agriculture
Tropical Dry Evergreen Forests found along the Buckingham Canal
Claims to Get Clearance

No sensitive areas
No scarce resources (water)
No sand dunes
No migratory species
No mangroves/seagrass
No agriculture
No Forests
82 water bodies
Sand Dunes

“Community Mapping of Sand Dune Ecosystems of the Panaiyur Coast, Kanchipuram District, Tamil Nadu”

Results:
Confirms presence of continuous stretch of well-established dunes
Dune begins at 5-10 m from beach berm, extends 570 metres
Average height: 9.774 m
Stretches for more than 1 km
North and South of Periakuppam Coal stacking yard to come up atop a large sand dune
False Claim: Barren land; no agricultural land

EAC minutes: “82% agricultural land in the project site”
Findings:
- 77 species of waterfowl
- 8 out of 42 endangered birds recorded
- Breeding and feeding ground

Recommendation:
- Relocate Cheyyur UMPP Project
- Declare area ecosensitive
Findings-
• Study conducted around the proposed cheyyur power plant site.
• 294 Plant Species found including Solena Angulata
• Coastal Vegetation, Sand Dune Vegetation and Tropical Evergreen Vegetation.
• Ecological and Botanical features make it an area of conservation importance.

Recommendations –
• Power Plant could be moved to a non ecologically sensitive area
## Heavy Metals and Coal

<table>
<thead>
<tr>
<th>Substance</th>
<th>Concentration</th>
<th>Maximum Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arsenic</td>
<td>7.6 ppm</td>
<td>342 mg/kg</td>
</tr>
<tr>
<td>Cadmium</td>
<td>0.058 ppm</td>
<td>2.6 mg/kg</td>
</tr>
<tr>
<td>Chromium</td>
<td>22 ppm</td>
<td>990 mg/kg</td>
</tr>
<tr>
<td>Lead</td>
<td>48 ppm</td>
<td>2160 mg/kg</td>
</tr>
<tr>
<td>Antimony</td>
<td>0.7 ppm</td>
<td>31.5 mg/kg</td>
</tr>
<tr>
<td>Strontium</td>
<td>340 ppm</td>
<td>15300 mg/kg</td>
</tr>
<tr>
<td>Uranium</td>
<td>1 ppm</td>
<td>45 mg/kg</td>
</tr>
<tr>
<td>Mercury</td>
<td>0.22 ppm</td>
<td>9.9 mg/kg</td>
</tr>
</tbody>
</table>

**Arsenic**
- Carcinogen. Affects heart, skin, peripheral nervous system.
- Accumulates in freshwater plants and bivalves and enters food supply.

**Cadmium**
- Causes lung and prostate cancer, bone disease, anemia and learning disabilities.

**Chromium**
- Nasal ulcers, respiratory disorders, lung cancer, stomach tumours.
- Sperm damage reported in lab animals.

**Lead**
- No safe level for children.
- Neurological damage. Learning disabilities, attention disorders and behavioural problems.

**Antimony**
- Respiratory, cardiovascular and gastrointestinal disorders.

**Strontium**
- Naturally occurring strontium not harmful. But radioactive isotopes can cause bone cancer.

**Uranium**
- Reproductive toxin. Can also affect kidney, brain, liver and heart.
- Uranium decays into radon which is associated with lung cancer.

**Mercury**
Hydrological Impacts
Altering Drainage; Endangering People
Protests: Making it Real for Investors
Two UMPPs 6 mi Apart
Coal and More

- SIPCOT Industrial Estate
- SIMA textile park – water intensive
- IL&FS 4000MW
- CPCL 1320 MW
- SRM 1980 MW
- NOCL Refinery – 6 mtpa
- Neyveli – 3000 MW
- 256 sq km PCPIR
- Coal plant clusters in Sirkazhi 4260MW
Wish List

- Cost to Health (Public; state; proponent)
- Cost to Environment (Public; state; proponent)
- Land-use change-induced Vulnerability (World Bank $250 million project)
- Coal = Asbestos (Medico-legal/Env Liability)
- Just Transition – Start Talking
Pre-Application Conference
for
Odisha and Cheyyur Ultra Mega Power Projects
4000 MW Each
Tuesday - 15th October, 2013
Bangalore Hall, ‘The Ashok’ Hotel, New Delhi

RISKY
POWER PLANT
INVESTMENT