Challenges and issues faced by power plants in achieving 100 % fly ash target (10.03.2021)  
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Presentation outline

Current status and Policies

Ash Generation in TPPs and Storage

Challenges for 100% Bottom Ash Utilization

Challenges for 100% Fly Ash Utilization

Challenges for Pond Ash Utilization and Land Recovery

Policy intervention
Ash Generation in TPPs and Storage [Pan India Vs NTPC]

### SUMMARY OF FLY ASH GENERATION AND UTILIZATION IN NTPC

<table>
<thead>
<tr>
<th>Description</th>
<th>Year 2019-20</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Thermal Power Stations from which data was received</td>
<td>: 197</td>
</tr>
<tr>
<td>Installed capacity (MW)</td>
<td>: 200691.50</td>
</tr>
<tr>
<td>Coal consumed (Million tons)</td>
<td>: 678.68</td>
</tr>
<tr>
<td>Fly Ash Generation (Million tons)</td>
<td>: 226.13</td>
</tr>
<tr>
<td>Fly Ash Utilization (Million tons)</td>
<td>: 187.81</td>
</tr>
<tr>
<td>Percentage Utilization</td>
<td>: 83.05</td>
</tr>
<tr>
<td>Percentage Average Ash Content (%)</td>
<td>: 33.32</td>
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</tbody>
</table>

- NTPC Installed Capacity: 64880 MW
- Coal Consumed (Million tons): 169 MMTPA
- Fly ash Generation (Million tons) : 44.33
- % Ash utilisation: 73.77
- Ash stock levels (MMT): 587.14

- Adopting different technologies for safe and productive utilization of fly ash and this increased the utilization of fly ash from 6.64 million tons in 1996-97 to 187.81 Million tons in 2019-20.
- In India an area of 65000 acres* of land is being occupied by ash ponds.
- #One acre land is required for every MW of power generated for ash

Challenges for 100% Fly Ash Utilization

• While regulations mandating 100% utilisation of fly ash are have been in place since 2003, a substantial quantum still remains unutilised, in addition to the huge quantity of inventory fly ash from previous years stored in the ash ponds.

• Demand supply scenario varies widely across locations due to limited infrastructure development in the region. Distance of the TPPs from cement plants and manufacturing units of other construction materials also act as a deterrent due to cost considerations.

• Currently, the onus of utilisation lies on the TPPs. However, there are no facilitating platforms or mechanisms to coordinate collection, distribution, and management of fly ash.

• Bulk Transportation of Fly ash through BTAP wagons From remote stations like VSR.

Note: Data for FY 2020 has been captured from April 2019 to September 2019 only.
Way forward for 100% Fly Ash Utilization

- Increase the minimum permissible limit of fly ash in cement – At present, regulations only mandate the 35% use of fly ash by weight in cement.
- Creating an ecosystem of fly ash-based products in the country - Currently the use of fly ash in bricks and tiles is just 10% of total utilization
- An array of products from fly ash like bricks, tiles, wall construction material, light weight aggregates, floor tiles, wall tiles, pavement blocks, etc should be explored.
- Increased use in agriculture – India being an agrarian economy, presents considerable scope for the utilisation of fly ash.
- Establish & operationalize ash parks to reach to bricks manufacturers
- Incentivize fly ash off take from pit head stations
- Go for more and more long term tie ups with users/ cement industries.
- Installation of classifiers / fly ash grinding units to ensure availability of fixed quantity fly ash for specific purpose and export.
- Increased disposal of fly ash in mine back filling
- Multi-stakeholder platform: A multi-stakeholder platform may be created to facilitate structured engagement between Government departments, TPPs, research organisations, civil society, and other relevant industry associations.
Way forward for 100% Fly Ash Utilization

Game Changers: FLY ASH BRICKS
- Fly ash Brick Cluster of about 100 Brick Plants within 100 kms from Plants; can consume Pond ash / Fly ash & Bottom Ash
- Fly Ash Depots near consumption centres at a distance of 100-200 kms
- Railway siding near plants and consumption centres

ROAD MAP: FLY ASH BRICKS
- Awareness Creation - Extensive Fly ash workshops in a radius of 300 kms in all consumption centres
- CREDA / Builders assns/Govt Agencies involved.
- Mobile Fly ash Brick Machine to Clay brick units
- Fly ash promotion agencies may be deployed
- Pradhan Mantri Grameen Sadak Yojana & Awas Vikas Yojana

Game Changers: CEMENT
- 2 to 3 Cement Grinding Units within 40 kms from Power Plants of Cement capacity 5-10 MMT
- Fly ash by Rail transportation to Cement Plants within 400 kms
- Discount/ priority may be given to those gypsum lifting agencies who assure lifting fly ash from the station.

ROAD MAP: CEMENT
- Acquiring major stake in nearby Cement plants
- To conduct PPC / Composite Cement awareness workshops to Govt. bodies and Builder Assns
- Liaison agencies for supply chain management (make available PPC easily)
Challenges for 100% Bottom Ash Utilization

- Present bottom ash disposal system: Bottom ash from grinder & coarse ash from economizer hopper is sent to hydrobin. Where after decantation, bottom ash is sent to ash mound (20% of total ash).

- Non-availability of separate Dry bottom ash collection system except few power plants.

- Need for separation at power plant end.

- Lack of separate segregation of bottom ash

- Non-availability of BIS standard on use of bottom ash as a aggregate constituent in concrete & concrete product
Way forward for 100% Bottom Ash Utilization

- Separate collection system
- Availability of BIS standard on use of bottom ash as a aggregate constituent in concrete & concrete product
- At Present, 900 RMC units in Metros and 2600 RMC Units operate in Tier1 and Tier 2 Cities;
- Present consumption by RMC 60 MMT (Penetration of RMC in India 8% as compared in USA 88%, China 33%)
- A 50% penetration in RMC segment can consume complete Bottom ash produced in India

Game Changers:
- **Bottom ash resource centres** in Tier1 and Tier2 cities within 500 kms
- Bottom ash in Jumbo bags by Rail transportation to RMC Units within 500 kms
- Bottom concrete (can take 50% BA insand in Concrete Mix)
- Pradhan Mantri Awas Vikas Yojana

ROAD MAP:
- Bulk electricity supply agreement with major RMC players such as Ultratech & ACC
- To conduct PPC and BA Concrete awareness workshops to Govt. bodies and Builder Assns
- Liaison agencies for supply chain management
The ash demand centers and ash pond location are far apart from each other and transportation cost is major Burdon to low cost reliable power which is born by power plant in most of the cases like supply of ash till NHAI sites.

**The stations are divided in three categories:**

**Category -1:** Where no ash is disposed off in ash pond/ash mound (Dadri and Talcher-Thermal)

**Category -2:** Where ash disposal will be stopped within 3-5 years’ time (Tanda, Unchahar, Solapur, Kudgi, Simhadri, Ramagundam, Farakka, Bongaigaon, Mouda).

**Category -3** Where ash disposal in ash ponds will be continued for some more years (Kahalgaon, Barh, Singrauli, Vindhyachal, Rihand, Korba, Sipat, Talcher-Kaniha)

<table>
<thead>
<tr>
<th>Region</th>
<th>Plants</th>
<th>Pond ash stock (MT)</th>
</tr>
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<tbody>
<tr>
<td>NR</td>
<td>VSR, Tanda, Unchahar</td>
<td>205.52</td>
</tr>
<tr>
<td>DBF</td>
<td>Dadri</td>
<td>0.00</td>
</tr>
<tr>
<td>WR-1</td>
<td>Mouda, Solapur</td>
<td>1.55</td>
</tr>
<tr>
<td>WR-2</td>
<td>Korba, Sipat, Iara, Gadarwara, Khargone</td>
<td>93.29</td>
</tr>
<tr>
<td>SR</td>
<td>Rgdm, Kudgi, Simhadri</td>
<td>87.09</td>
</tr>
<tr>
<td>ER-1</td>
<td>Kahalgaon, Farakka</td>
<td>112.94</td>
</tr>
<tr>
<td>ER-2</td>
<td>Talcher, Bongaigaon</td>
<td>86.74</td>
</tr>
</tbody>
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Policy intervention

- **Policy on “Ash depot development and transportation network development by GoI”** to reduce gap between ash demand centers and ash pond location may increase ash utilization of remote area power plant where ash utilization is very low presently.

- **Policy on “Promoting R&D in Ash utilization”** to create new avenue for Ash utilization business in the Country.

- **A multi-stakeholder platform** may be created to facilitate structured engagement between Government departments, TPPs, research organisations, civil society, and other relevant industry associations. The platform would facilitate research and development of good practice solutions and models in different thematic areas such as construction, road development, mining, agriculture etc.

- **Tax incentive-** Ash utilization start ups.
Thank You