Chandrapur Super Thermal Power Station

MAHAGENCO
Maharashtra State Power Generation Co Ltd

WATER CONSUMPTION

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CSTPS, Chandrapur

Index

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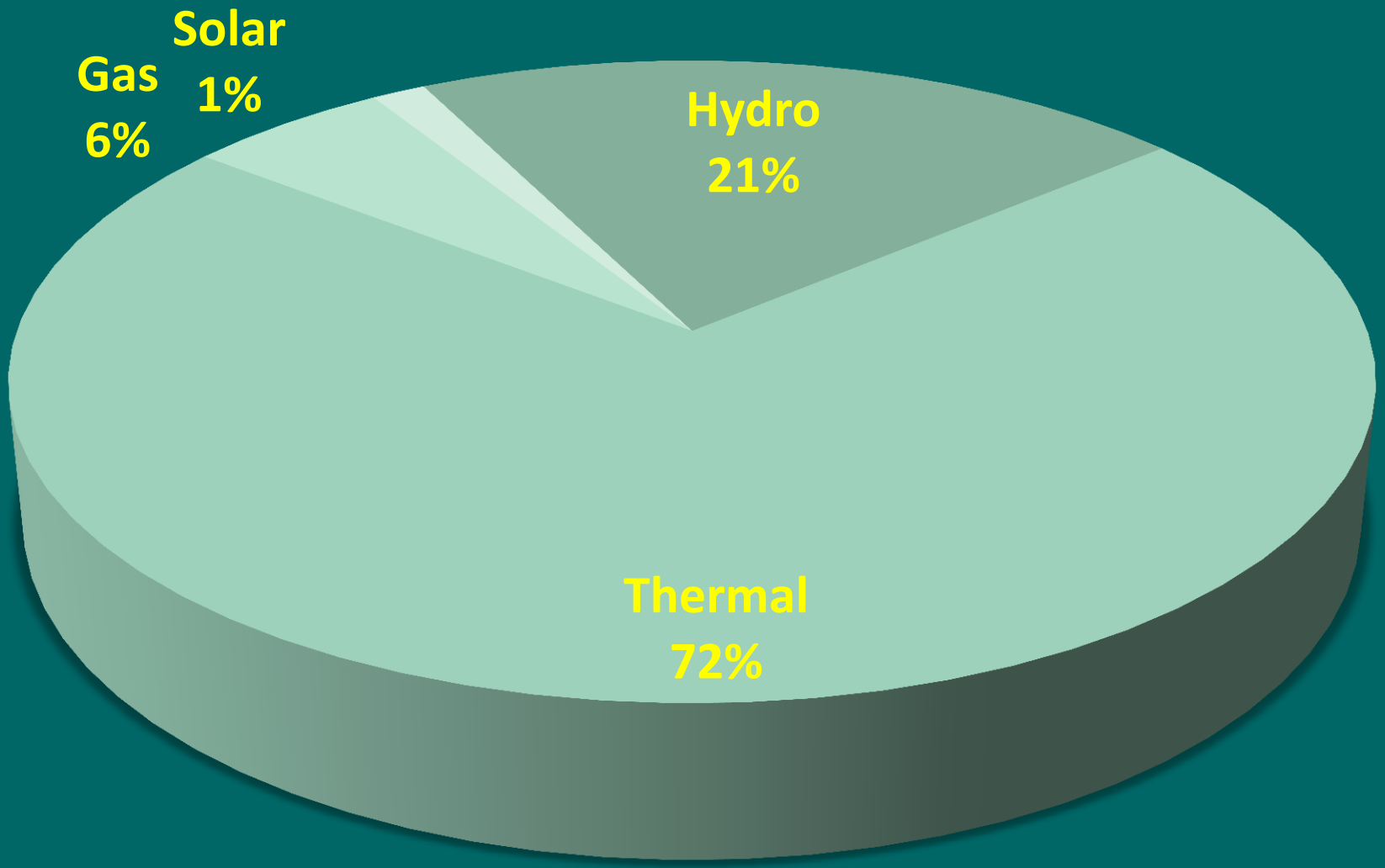
1. Introduction of MAHAGenco & CSTPS
2. Water Circuit
3. Water balance
4. Technological/Operational challenges and constraints
5. Technologies adopted
6. Impact of tariff
7. Way forward

1. Introduction of MAHAGenco & CSTPS

Maharashtra State Power Gen. Co; Ltd.

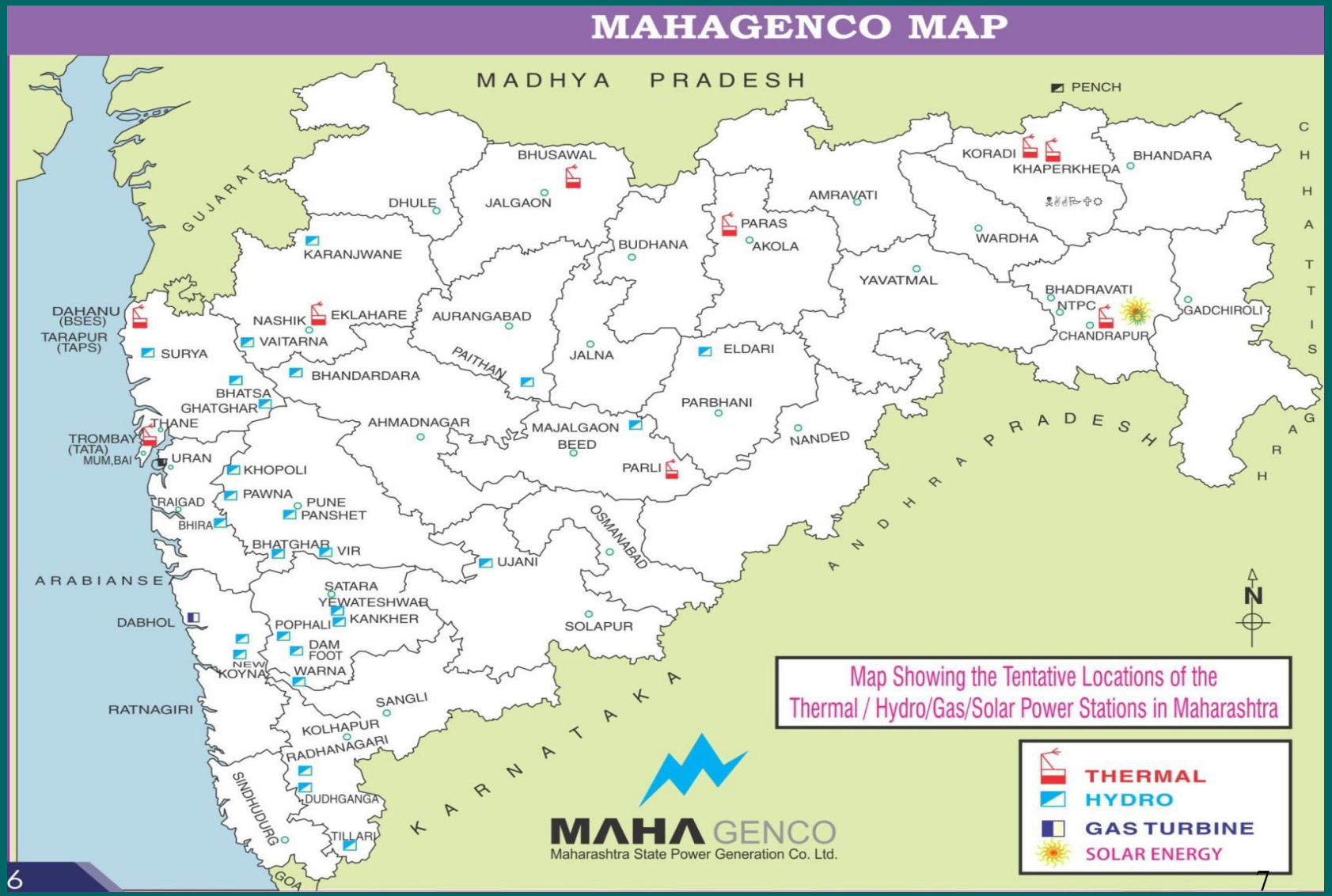
- MAHAGenco is Maharashtra State run Power utility company.
- Highest overall generation capacity and the highest thermal installed capacity amongst all the state power generation utilities in India.
- Second highest generation company after NTPC in terms of installed capacity.
- Only State Utility having balanced generation portfolio involving thermal, hydro, gas and solar stations.

MAHAGenco CAPACITY



AS ON 17.12.2015 : 12077 MW

MAHAGenco map



Chandrapur Super Thermal Power Station

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- Chandrapur Super Thermal Power Station (CSTPS) is located in Chandrapur district of Maharashtra.

- Region rich in mineral wealth (Ex. coal and limestone). large number of coal mines gave the city name- *Black Gold city*.

- With total capacity of 2340 MW(now 1920 MW) - the largest coal based power plant of MAHAGenco satisfying more than 25% of total Maharashtra needs.

- Extension of 500 MW X 2 in final stage.

- Coal is sourced from WCL, MCL, SECL, SCCL and MCL.

Chandrapur Super Thermal Power Station

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- Region known for its hot and dry climate. Humidity is very low in the region. However it receives an average annual rainfall of 1249.4 mm.

- The plant gets water supply from own Erai Dam & Chargaon Dam.

- @ 40000 m3/day water is also supplied to Chandrapur city from the Erai dam.

Achievements of CSTPS

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- **National Productivity Award for Better Performance - 13 times**
- **Incentive Award for reduction in Sp. fuel oil consumption - 7 times .**
- **Incentive Award for reduction in Aux. power consumption - 2 times .**

- **Green-tech Award for Environment – 2 times (Silver).**

- **Quality Circle movement is well established and QC from CSTPS achieved Excellent & par excellent awards in national & International Conventions.**

CSTPS is a Certified Unit For;

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ISO 9001

Quality Management System.
Since 21 Sep. 2000.

ISO 14001

ISO 14001 REGISTERED
MGMT. SYS.
RvA C 425
DNV Certification B.V., The Netherlands

Environment Management System.
Since 26 May 2004

OHSAS 18001

DNV

Occupational health & safety
Management System.
Since 1Oct. 2005

Unit position

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Unit No.	Capacity	Date of Commissioning	Date of Commercial Operation	Age
1	210 MW	15-Aug-83	01-Nov-84	32;Decommissioned
2	210 MW	11-Jul-84	16-Sept-85	31;Decommissioned
3	210 MW	03-May-85	01-Apr-86	30
4	210 MW	08-Mar-86	04-Nov-86	30
5	500 MW	22-Mar-91	01-Dec-92	25
6	500 MW	11-Mar-92	01-Dec-93	24
7	500 MW	01-Oct-97	01-Mar-98	18
8	500 MW	Commissioning is in progress		
9	500 MW			

SOLAR PLANT

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Unit No.	Capacity	Date of Commissioning	Age (Yrs)
1	1 MW	Oct-2010	06
2	2 MW	Mar-2012	04
3	2 MW	May-2012	04

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2. Water Circuit

Erai Dam - Our Source of Water

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Erai Dam Features

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- Constructed in 1984, it is 420-metre masonry dam, on the river Erai at a distance of about 12 km from the power station.
- Reservoir area – approx. 7041 hectares (550 km^2)
- Effective Storage Capacity – 193 mm^3.
- Erai Dam height raised by 0.5 meter in Sep-2010.
- Water storage increased by 18 mm^3 . Net storage- 211 mm^3.
- Full Supply Level – 207.500 meter
- Water availability as on date: 205.325 meter
- This water is sufficient for days: 234 days

Water supply

- **Water is supplied by 5 nos. of pipelines by gravity flow and distributed to 2 nos. of reservoirs in CSTPS area.**
- **Diameter of pipes are:**

  4 lines of 1200 mm dia. PSC pipe.

  1 line of 1600 mm dia. M.S. pipe (common).

- **Further water is used for different purposes as:**

i) Cooling water system for condenser & plant auxiliaries

ii) Air conditioning and ventilation system

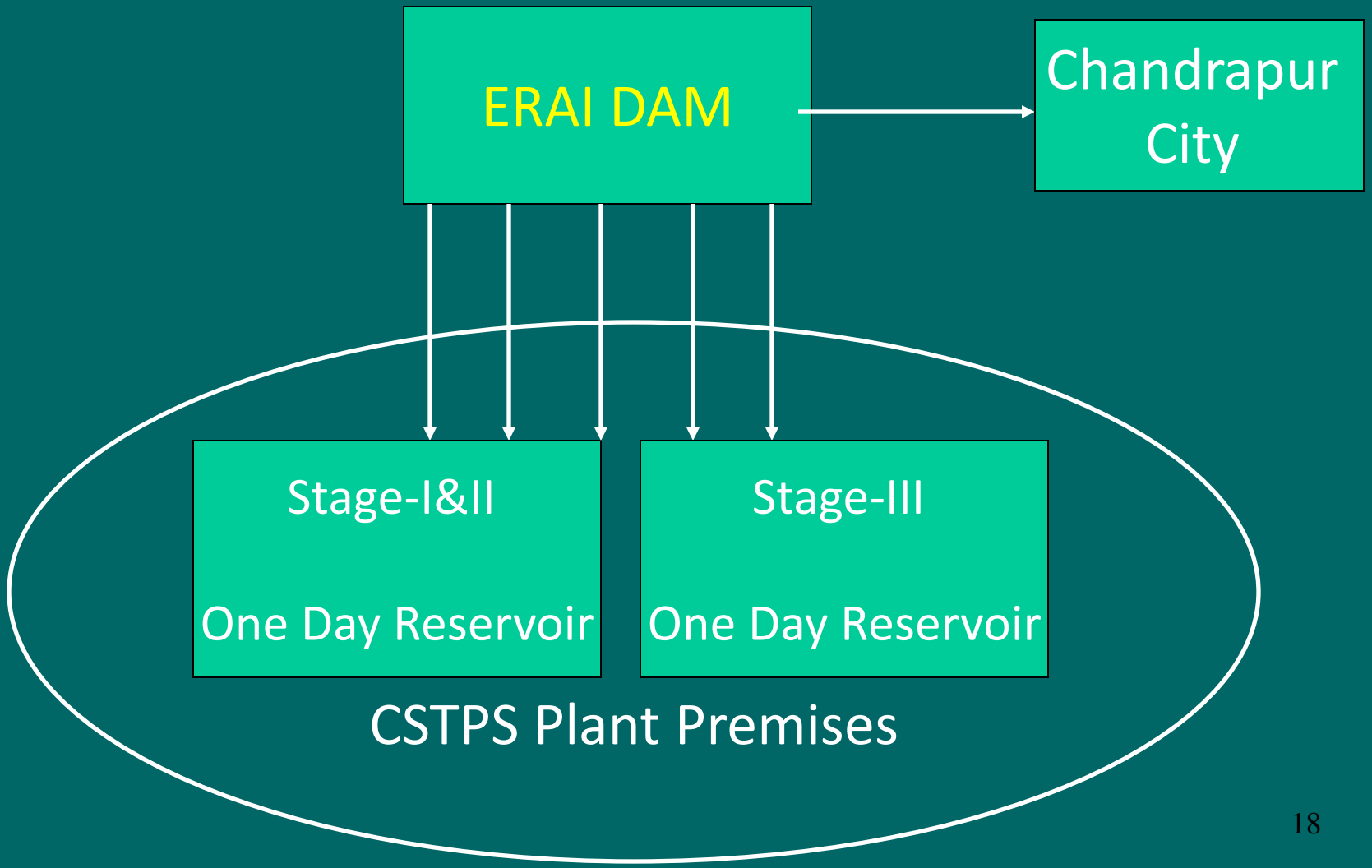
iii) Ash handling system **iv) Power cycle make up**

v) Equipment cooling system **vi) CPU regeneration,**

vii) Coal dust suppression system **viii) Potable water system**

ix) Service water system/Fire-Fighting **x) Gardening**

Water from Erai Dam



One Day Water Reservoir

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Quality of water

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- Flowing through forest catchment area and no industries and population upside, the quality of water available to CSTPS is with least contamination.

- The water is free from oil, detergent and other industrial pollutants.

- Even the seasonal variations are very minor.

Parameter	pH	Cond	Chloride	Total Hard-ness	p Alkalinity	M Alkalinity	Turbidity
Unit	-	uS/Cm^2	ppm	ppm	ppm	ppm	NTU
Raw water	8.0 - 8.57	257	12	74	0	108	1-5

Water Circuit

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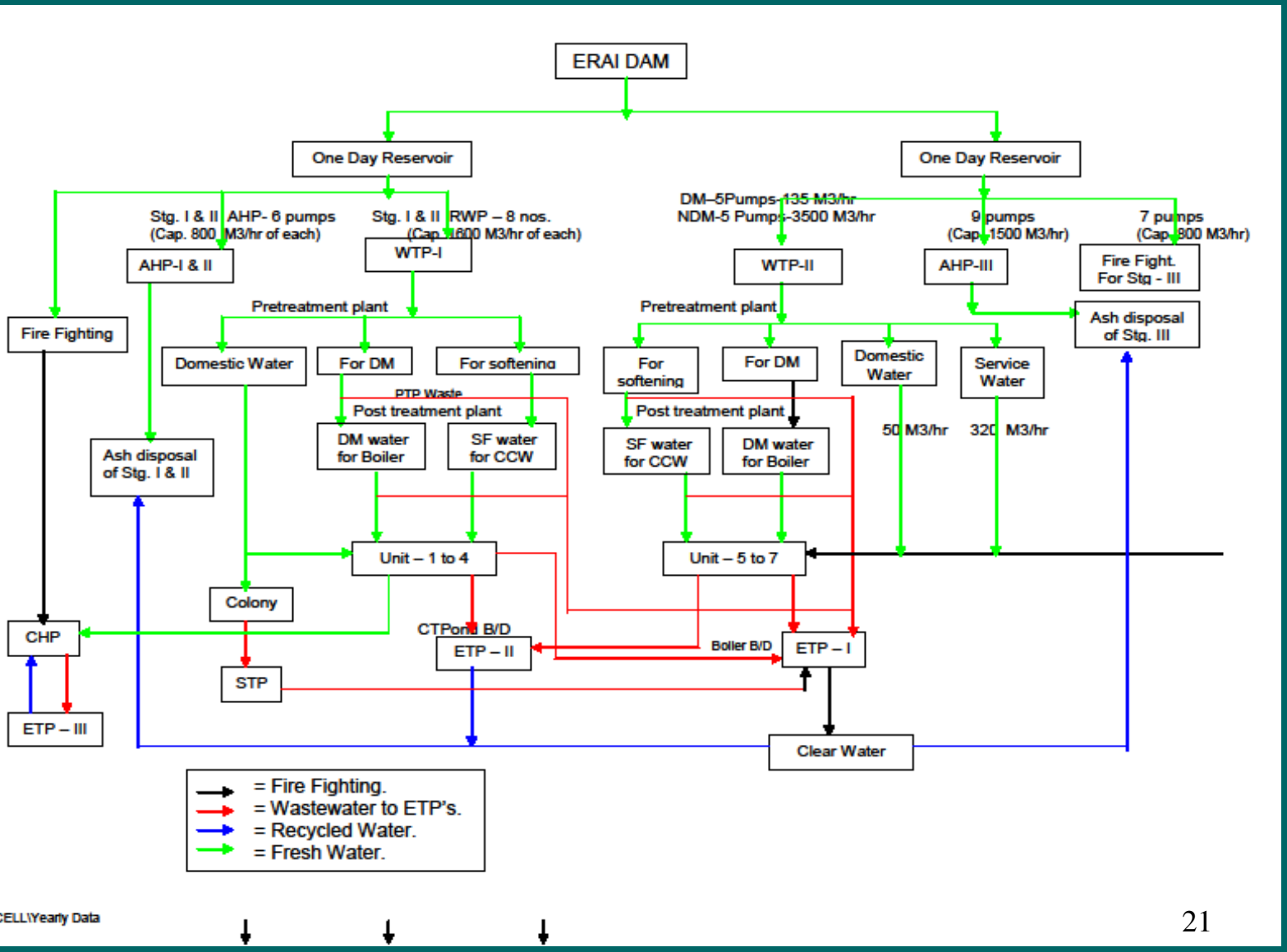

User-64\ENV CELL\Yearly Data

3. Water Balance

Area wise annual water consumption

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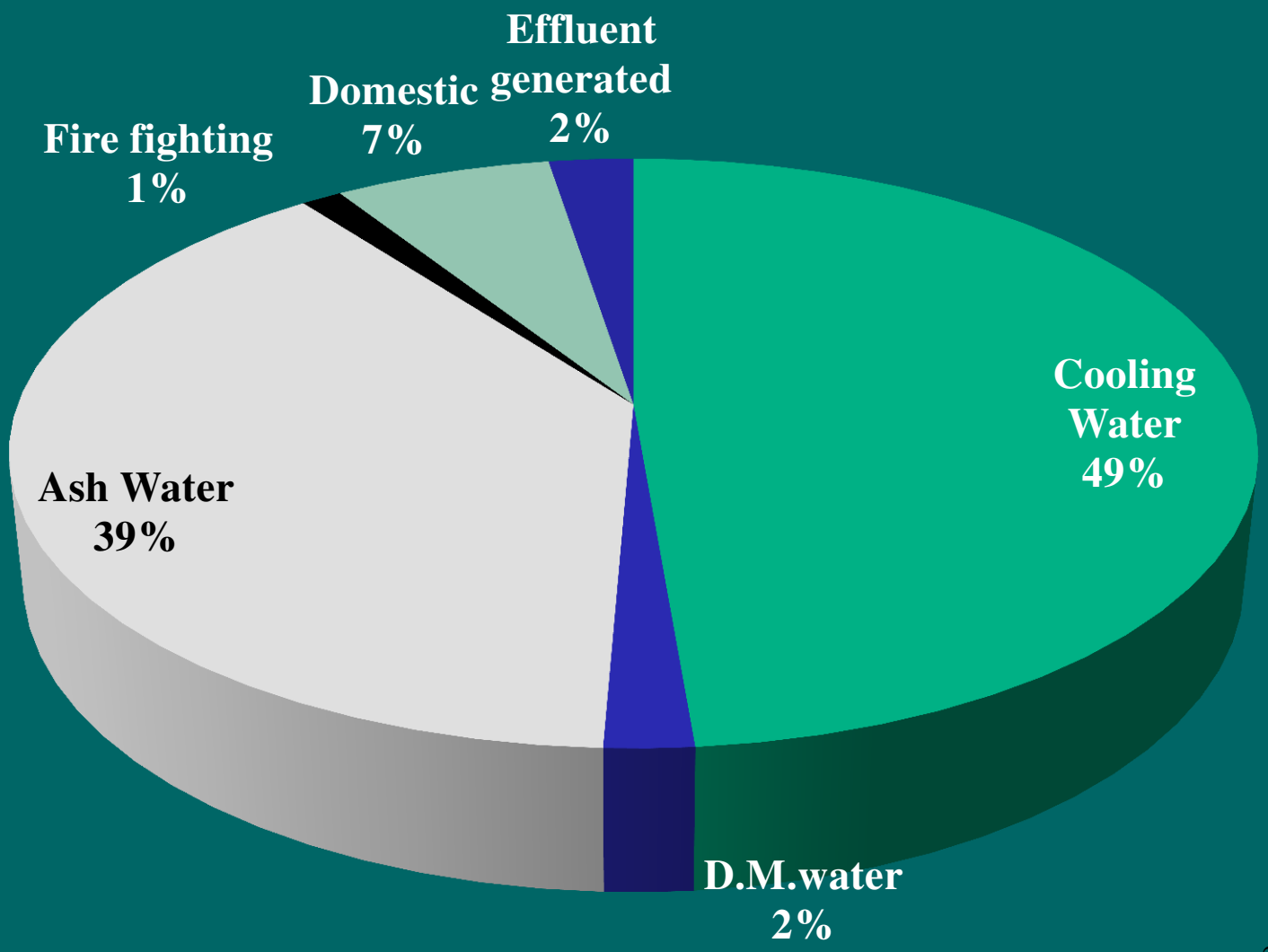
Year	Cooling water	D.M water	Ash handling water	Fire fighting	Domestic	Effluent generated	Total water utilised
	m3	m3	m3	m3	m3	m3	m3
2009-10	35048818	1220222	18146502	803000	4374398	1874463	61467403
2010-11	26330720	1219235	21163532	803000	4241667	1438460	55196614
2011-12	29109380	1337915	26853417	805200	4841160	1589261	64536333
2012-13	34662480	1511777	28471231	803000	4697184	1822435	71968107
2013-14	28980514	1046358	28898514	803000	3991936	1248080	64968402
2014-15	33900037	1442704	26203084	803000	3962729	1879422	68190976
2015-16	33265856	1276707	27438118	803000	4270450	1669700	72810048

Average annual consumption of water



Avg. water consumption on daily basis

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Purpose	M^3/day
Fire fighting	1700
D.M.Water	3050
Ash water	76050
Domestic water	18650
Cooling water	95550
Raw water	195000

Specific water consumption

- As per revised notification of MoEF, the limit of specific water consumption is 3.5 lit/kwh.
- MSPGCL is committed to achieve this norm. Same is being done by strict monitoring of water consumption of each TPS by corporate office.
- We are confident that the Slightly higher specific water consumption will be brought down within next six months.

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4. Technological/Operational challenges and constraints

Constraints:

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1. Wet Ash slurry system (in 20:80 ratio) is used for ash handling which require more water.
2. Ash bund is @18 Km from TPS. Frequent leakages leads to loss of water.
3. No separate Service water line for auxiliary cooling .
4. Clinker formation prone ash in coal; requires high amount of water to remove it.
5. More number of blow downs required to CT Pond as coal & cement dust contaminate the cooling tower water.
6. Pipelines used for supply of water from Erai dam are very old.- 31 years.