

Water Conservation & Management Initiatives by Indian Industry



Presentation Overview

Emerging Scenario

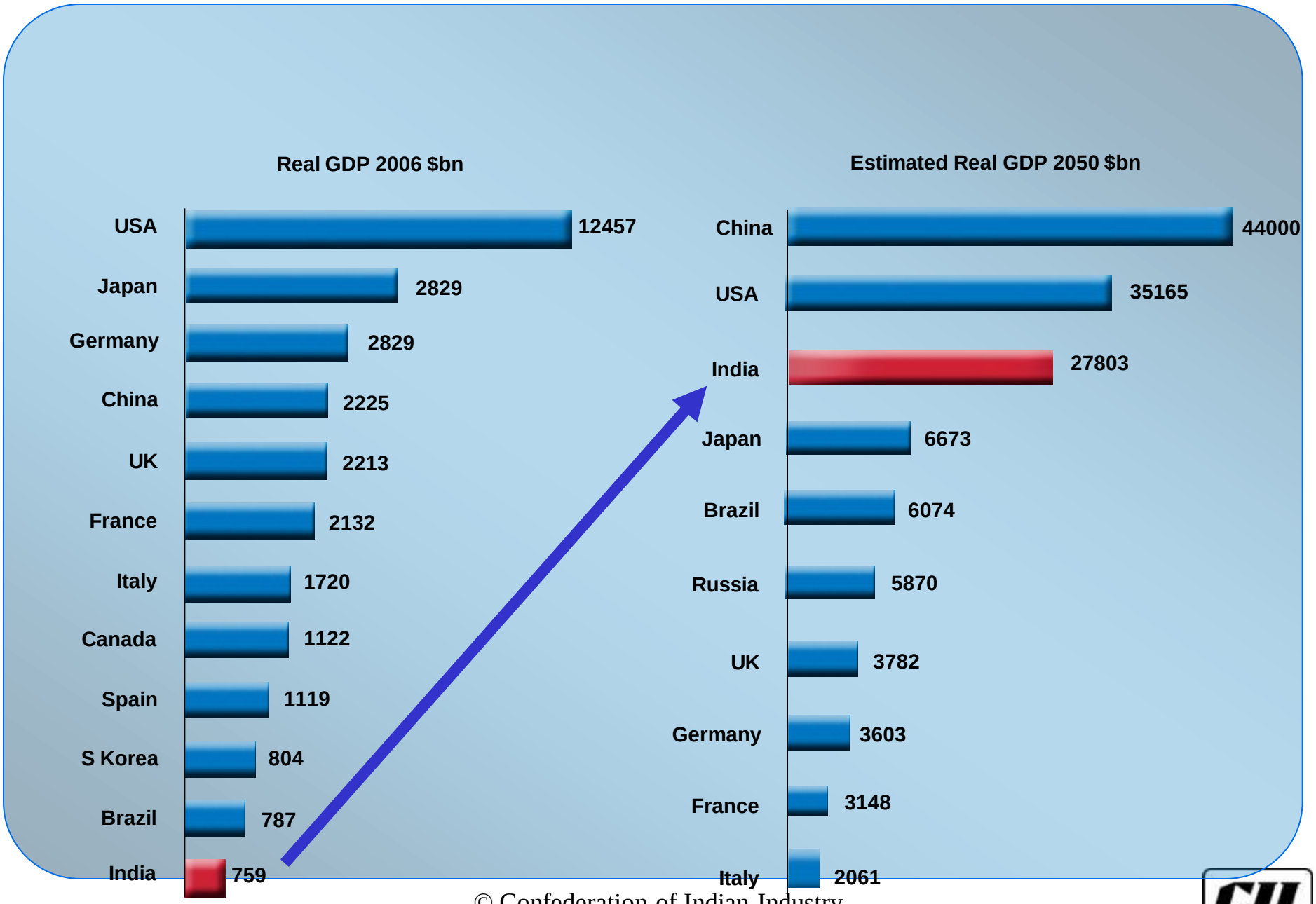
Our Waterscape

Promotion of Water Use Optimisation Reuse,Recycle & Reduce

Education, Extension, Encouragement

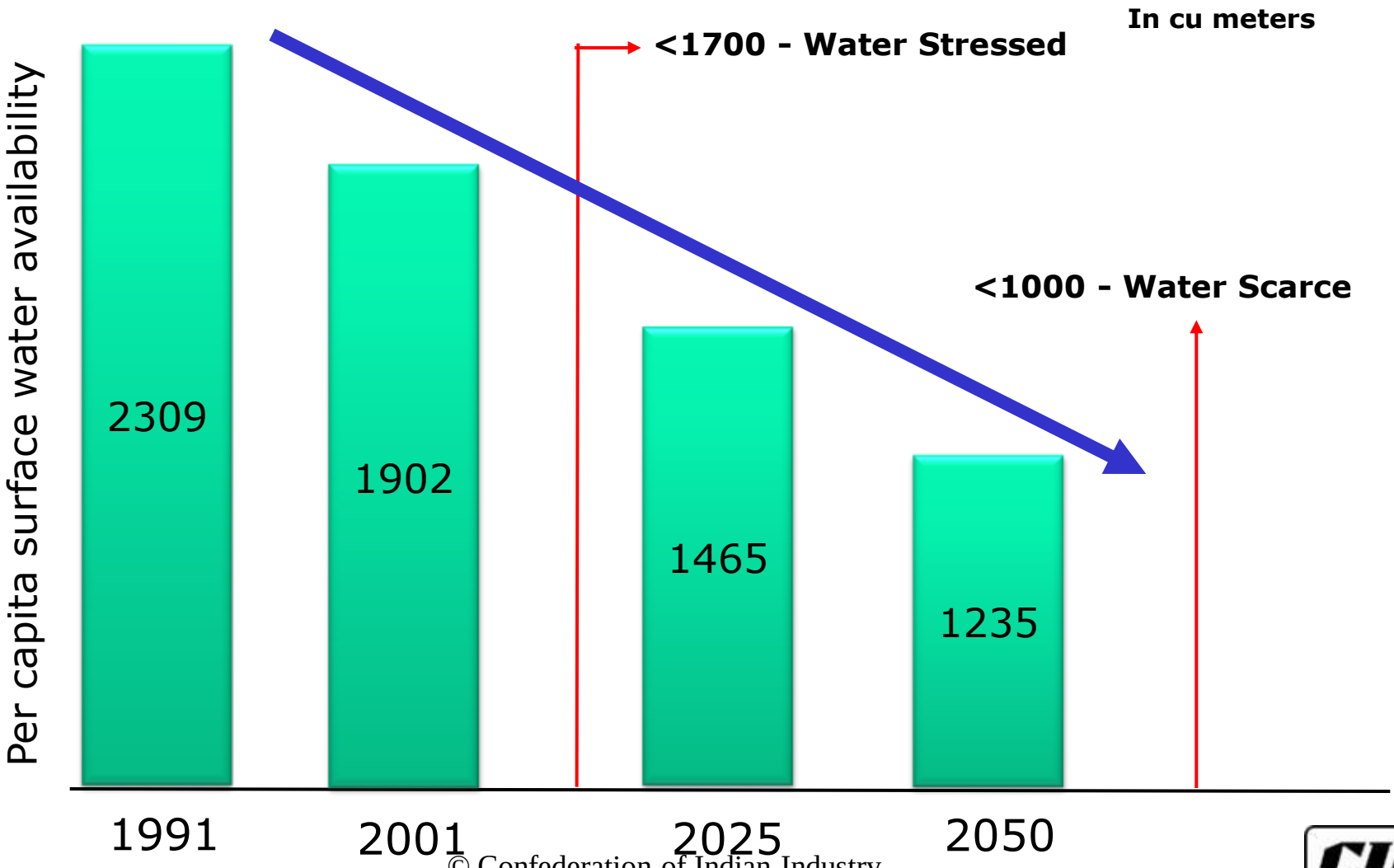
Case Studies & Publications

INDIA: Racing Towards #3 Economy



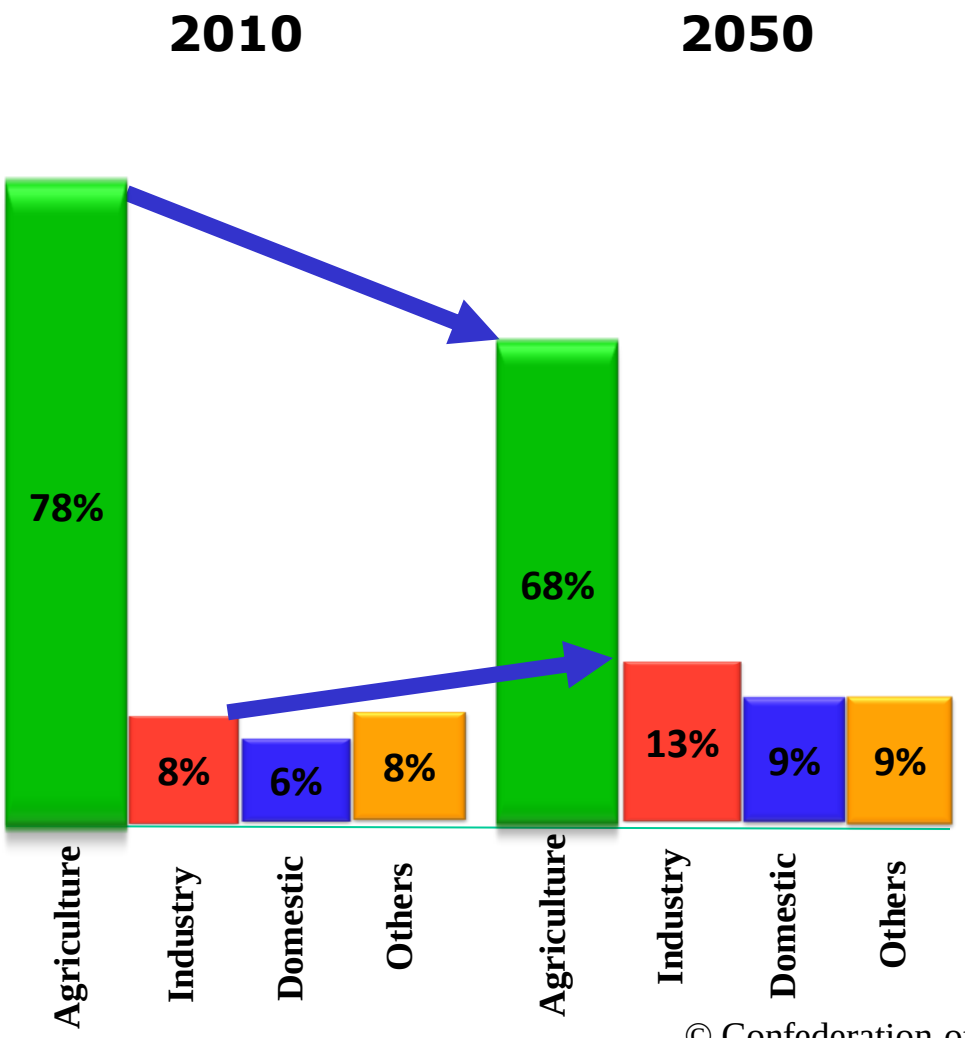
Source: Dreaming with BRICs: The path to 2050; Goldman Sachs

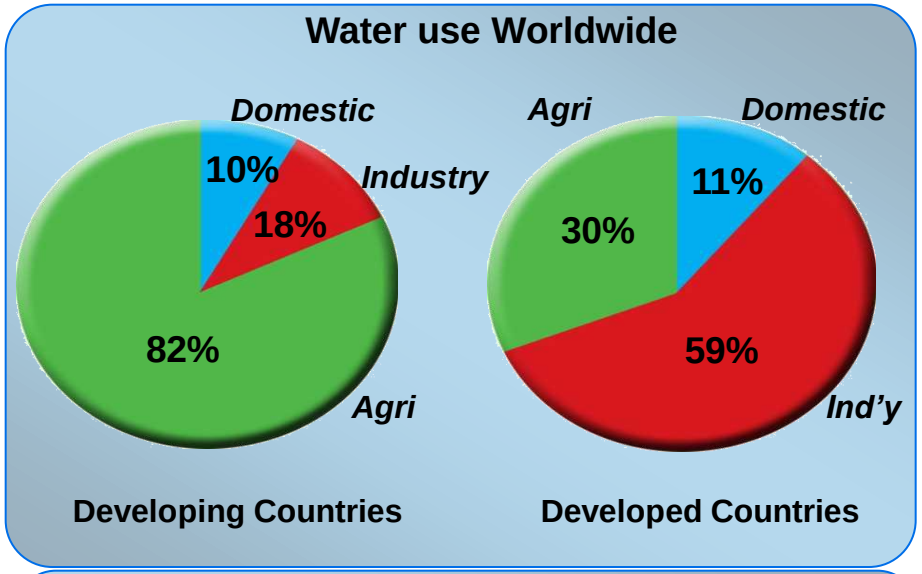
Less Water for Every Individual

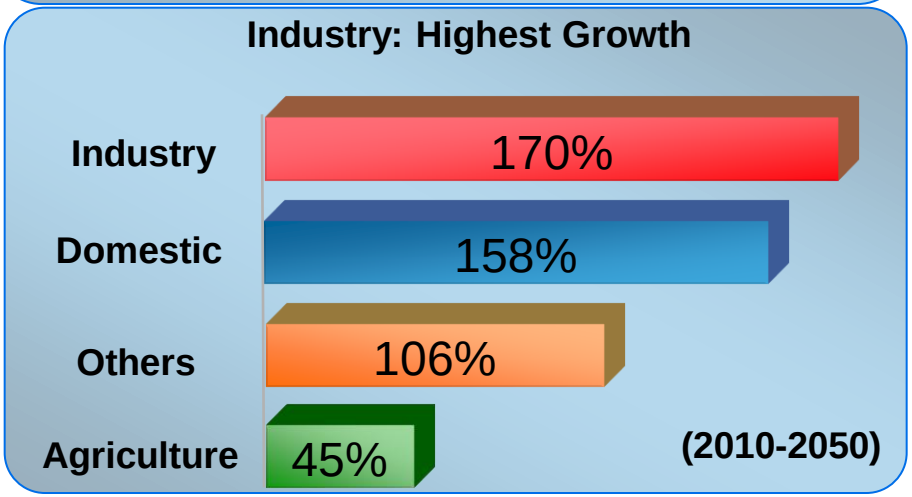


Source : Water resources of India, Rakesh Kumar, R. D. Singh, K. D. Sharma, National Institute of Hydrology, India

Industry: Highest Growth ... Key Role





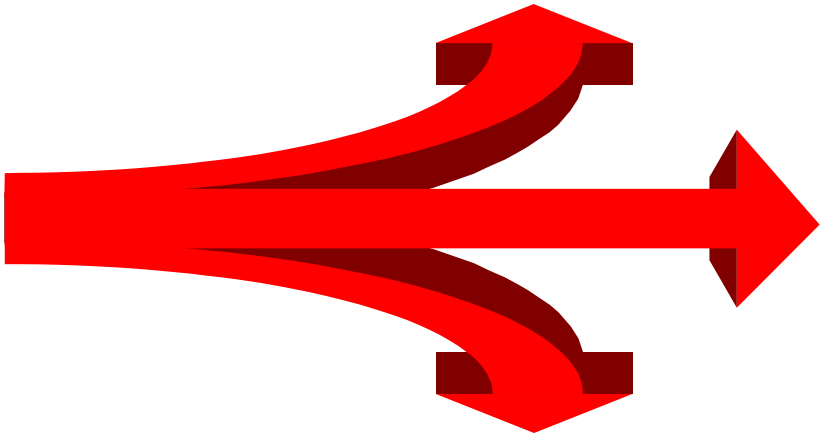


Source: Ministry of Water Resources, Government of India

Industry Initiative
Macro Level Approach

Policy Initiatives

3 pronged approach



Industrial Water Management (within fence)

- ❖ Information Dissemination
- ❖ Water Audits
- ❖ Water Awards

Water Projects (Outside fence)

- ❖ Promote private sector participation in water & watershed management
- ❖ Promote Rural drinking water projects

All activities are Industry driven

CII- Godrej GBC Water Management Activities

- **Industrial Water Services**
  - **Industrial Water Audits**
- **Awareness Creation through**
  - **Conferences, Training program, Missions.. Etc..**
- **Network with other stakeholders**
  - **Indian Business Alliance on Water (IBAW)**
    - **Facilitate PPCP projects on Water**
  - **IVL (Swedish Environmental Research Institute) project**
    - **Capacity building on cleaner production technology**
- **Setting up water Institute at Jaipur**

CII - Water Institute, Jaipur Rajasthan

The first of its kind in the world

(Government, Industry, Civil Society coming together)

Industry Initiatives

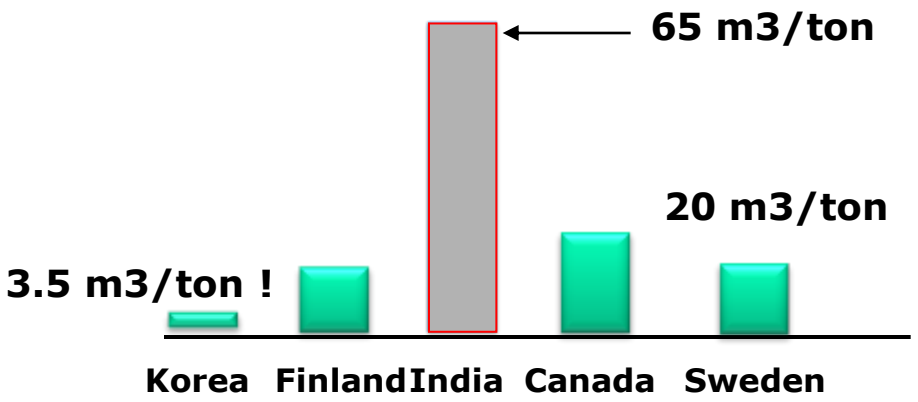
- Excellent initiatives by several industries
- Substantial reduction in Specific Water Consumption
- CII National Water Award – Annual event
- Excellent Platform for "Sharing of Information"
  - Best practices, in-house modifications, technology related projects
  - Projects – Within the fence & beyond the fence

Industry - Water efficiency

- **Water saving potential in Indian industry**
  - **35 – 50 %**
  - **Excellent Potential to reduce, reuse and recycle**
  - **Reduce water as well as conserve resources**

Eg: Pulp and Paper

Best figures in different countries



National Water Award
Performance of Participating Companies

- **Excellent performance by majority of the participating companies**
- **Average annual reduction in specific water consumption**
  - **Automobile : 6 – 15%**
  - **Buildings : 5 – 10%**
  - **Cement : 5 – 20%**
  - **Chemicals : 4 – 30%**
  - **Engineering : 8 - 16%**
  - **Fertilizers : 2 - 15%**
  - **Food & Beverage : 3 - 15%**
  - **Pharma : 8 – 12%**
  - **Pulp & Paper : 6 - 32%**

Benefits achieved by Top Water Efficient Companies

- **Water Award 2010**
- **Excellent performance by all the participating companies**

Overall - Annual average water saving of 47 million cubic meters of water achieved by participating companies

Water Conservation Initiatives Within the Fence

- Metering and monitoring
- Water saving devices / equipments
- Wastewater Treatment
  - Effluent treatment plants
  - Waste water recycling systems to recover chemicals, reduce waste and water consumption
    - Chemical, Engineering, Automobile, Pulp & Paper sector, etc
  - Technology applications for reuse of municipal waste water in industry

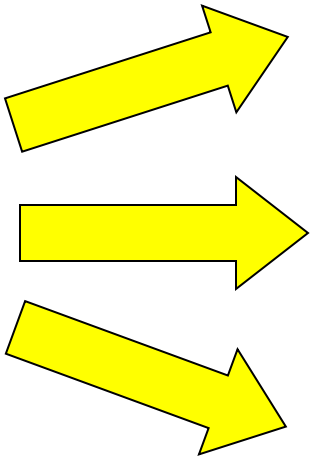
Water Conservation Initiatives Beyond the Fence

- Water & watershed development projects
- Water Harvesting structures & Checkdams
- Rural drinking water supply projects & Treatment of Raw water
- Groundwater recharge
- Recharge of ground water through Rain Water Harvesting
- Irrigation projects
- Recycling of Municipal Waste Water

Water conservation through Rating programs

Green Building Movement in India

In 2001,
1 Green Building
20,000 sq.ft.



1075 Green Buildings, 679 Million sq.ft.

Water Efficient Measures in Green Buildings

Dual Flush Water Closet

Sensor Faucet & Showers

Rainwater Harvesting

Drip Irrigation Systems

On-site Waste Water Treatment Plant

Root Zone Treatment System

Treated Waste Water for Cooling Towers

Water Meters

Water Saving Potential : 40% – 50%

Ultra Low Flow fixtures

- **Water less urinals**
  - No plumbing line for flushing
  - Uses a sealant liquid instead of water to maintain sanitary condition
  - Market Transformation:

Waterless Urinal

	2003	2010
Usage	Unknown	Millions of Installations
Cost	Euro 200	Euro 70

Zero Water Requirement

Water conservation – Rating Programs

- **Green Rating System for Companies**
  - **Latest initiative – Pilot projects**
  - **Water conservation & Management: 100 points**
    - **Top Management commitment**
    - **People Involvement**
    - **Reduction in Specific Water consumption**
    - **National / Global best in SWC**
    - **Rain water harvesting**
    - **Beyond the fence initiatives – Recharging water (1:1 to 1:4 times of annual consumption)**

Excellent platform / tool for implementing water projects

CII

Water awareness & conservation program for school children

- Program initiated at schools in Hyderabad and Jaipur
- Objective : to create awareness on water conservation through the program
- Completed 25 schools
  - Over 1000 students participated in the program
- Awareness programs by Member companies

Indian Business Alliance on Water (IBAW)

- **Formed by WEF & CII- Godrej GBC in 2006**
  - **Facilitate 'Public Private community Partnership' projects in Water**
  - **Information dissemination**
  - **USAID, UNDP & SDC supported the IBAW initiatives**

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Agency for Development and Cooperation SDC

USAID FROM THE AMERICAN PEOPLE

WORLD ECONOMIC FORUM
COMMITTED TO IMPROVING THE STATE OF THE WORLD

UNDP

CII

CII

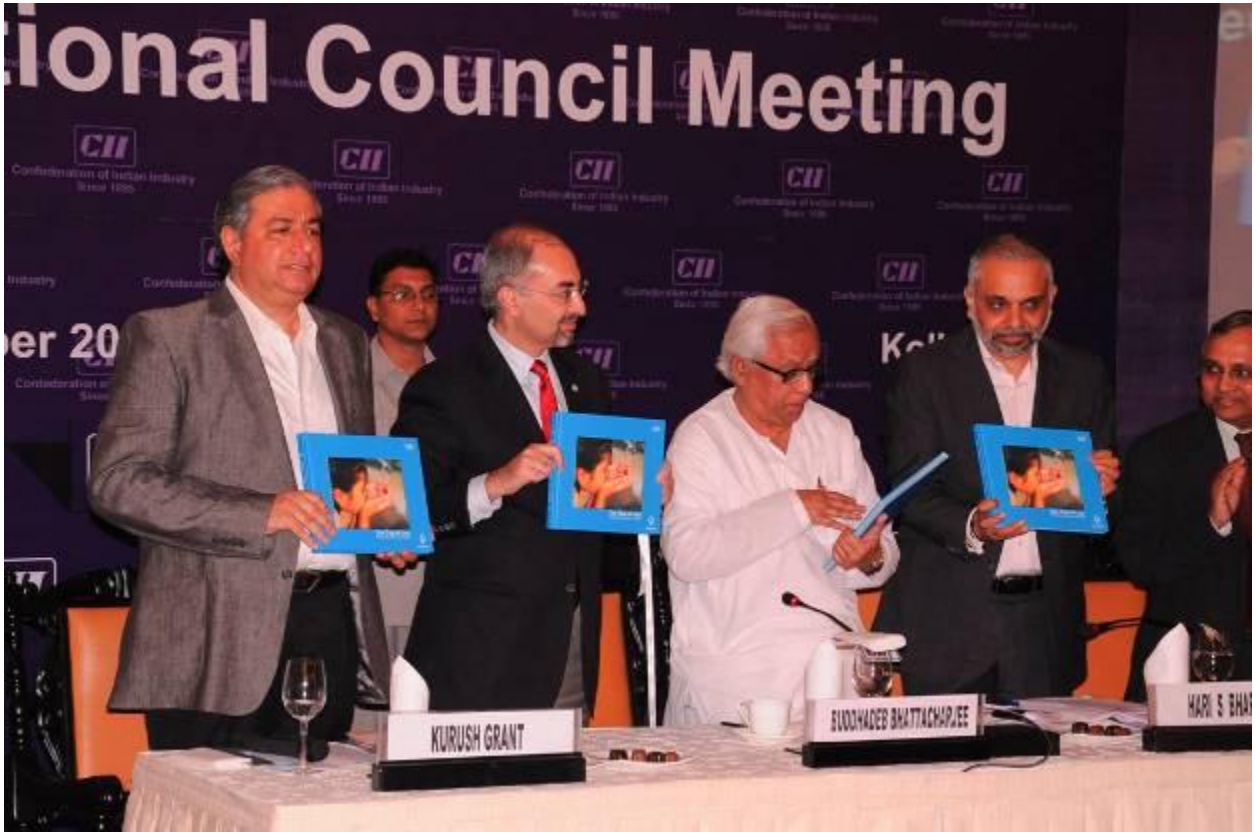
INDIA'S BEST PRACTICES ON WATER

Vol. I

Our Cup of Joy

India's Best Practices On Water

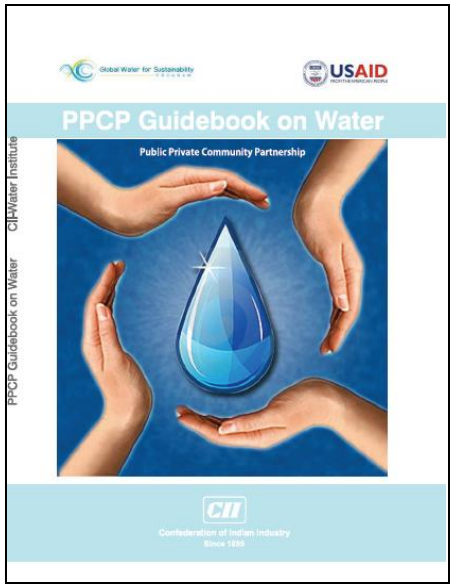
Release of 'Our Cup of Joy'



Hon'ble Chief Minister of West Bengal Shri Buddhadeb Bhattacharjee on 6 October 2010 at the CII – National Council Meeting, Kolkata

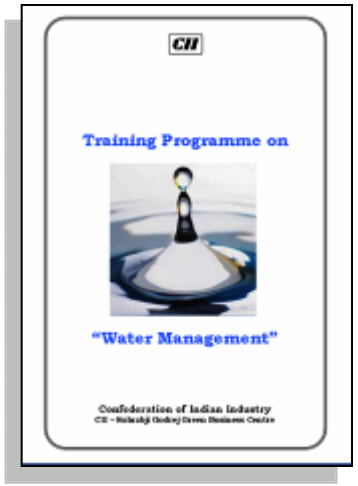
Water Activities at GBC…

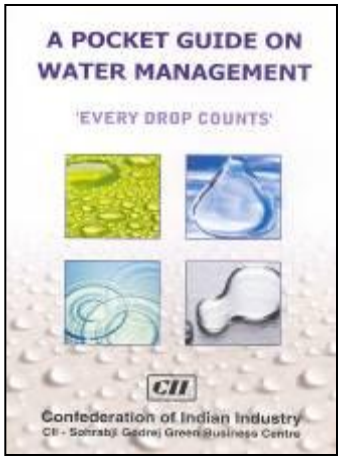
- **Capacity building of Indian Industry on 'Public Private Community Partnership' (PPCP) projects in water**
  - **4 Training Programs conducted**
  - **150 industry personnel covered**
- **Guidebook on PPCP on Water developed**



Training & Awareness programs

- Create awareness on water conservation through training programs
  - Over 200 industry personnel trained
- Publication of pocket guide on Water management
- Creation of teaching module on water conservation children has been developed
- Information dissemination through newsletters





Water Conservation & Management
Case Studies

Saint Gobain Glass, Sriperumbudur

- **Collection of rooftop rain water in reservoir**
  - **Water harvested 1,50,000 m3/year**
  - **Fresh water cost savings Rs 5 million**
  - **Investment Rs 20 million**
  - **Payback period 48 months**
- **Waste water recycling – RO plant**
  - **Water saving : 37,450 m3/year**
  - **Investment : Rs.3.4 million**
- **Air cooled condensers**
  - **Water saving : 21,900 m3/year**
  - **Investment : Rs.11.7 million**

Shree Cement, Beawar

❖Reduction in water consumption by installing waste heat recovery unit. 700 KL/day savings

❖Air Cooled Fluid Condenser at Power Plant, 2500 KL/Day water savings

❖ Second RO put up to treat the reject of RO I used for boiler feed water. Reject of RO II is used in gas conditioning tower instead of fresh water.

❖Treated water from STP used for plantation (ANNUAL FRESH WATER SAVINGS 39314M^3).

Innovations in Water Conservation

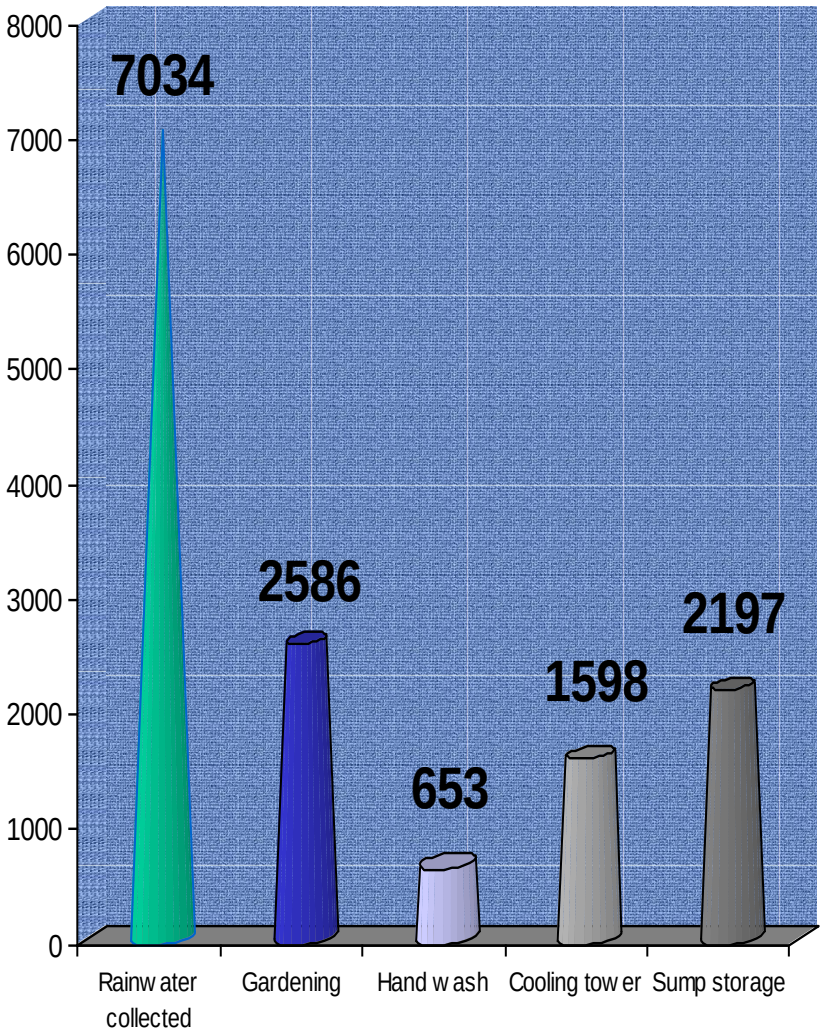
❖ Tata Chemicals Limited

- ➢ **Utilization of service boiler flue gas for neutralizing alkaline effluent of DM plant**
  - ❑ **Annual Water saving 10,000 M^3**
  - ❑ **Investment Rs 5.0 Lakhs)**
- ➢ **Replacement of drinking water header with UPVC in township**
  - ❑ **Annual Water saving 75,000M^3**
- ➢ **Recycling of Gas Turbine air condensate to cooling tower make up water**
  - ❑ **Annual water saving 80,000M^3**
  - ❑ **Investment Rs 3.0 Lakhs)**

Water Conservation & Management in Wipro Limited

- **Water savings method adopted are:**
  - Installation of auto sensors for urinals and wash basins
  - Monitoring water leakage on daily basis
  - Adjustment of water pressure through control knobs
  - Sewage treatment plant & reuse of treated water for gardening/landscaping and toilet flushing
  - Implementation of rain water harvesting
  - Drip irrigation system in the office gardens
  - Regular communication to employees on water conservation

RAIN WATER HARVESTING WIPRO EC – 123 BANGALORE



- Annual harvested water: 2254 KL
- Total 3 underground sumps each 100KL capacity
- Total cost of installation 1.2 million INR
- Drip irrigation system in the office gardens
- Regular communication to employees on water conservation

* CHART – Y axis –Water in Kiloliter

PEPSICO : Direct Seeding Of Paddy

Benefits

- Reduction in water consumption by 30%
- Farmer saving- Rs.1500/ acre
- Improved seed planting density
- Methane emission reduction
- Opportunity to earn carbon credits

Direct seeding machine developed by PepsiCo

Direct seeding in progress

120 days crop

2009 – Direct seeding- 6000 acres; water saved >5000 mn liters

ITC: Watersheds & Agri Development

Private, Public & Community Partnership (PPCP) In Rajasthan

Impact :

Farmer –
- Higher yield, better quality produce
- 30% increase in annual income
- Market linkage through e-chaupal

Landless –
- Decreased seasonal migration

Nation –
- Conservation of water and soil

ITC's watershed development program covers 26,700 hectares in the country

ITC Limited

ई-चौपाल
किसानों के हित में, किसानों का अपना

ABAN: Water Efficiency In Power

Gas Based Combined Power Plant, Tamil Nadu

Initiatives:

- Dry low NOx burners v/s other NOx burners
- Air cooled condensers in place of conventional cooling towers

Benefits:

- Water consumption: Reduced from 2500ltr/MWH to 102ltr/MWh
- Reduction of NOx from 1402 Kg/day to 374 Kg/day

TERI Corporate Award for "Environmental Excellence & Corporate Social Responsibility" June 2009.

Period	Water saving (Mn Ltrs)	Money saving (Rs Cr.)
2005-06 (8 months)	1353	4.1
2006-07	2061	6.2
2007-08	2142	6.4

Hero Honda: Rainwater Harvesting

Factory, Haryana

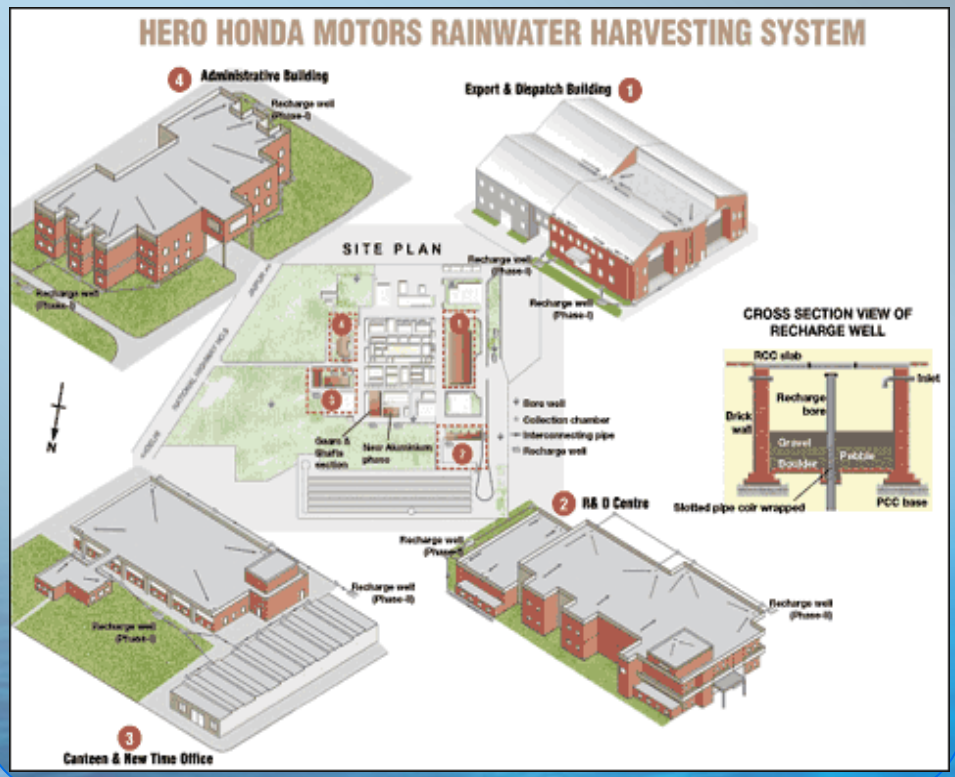
Area:

- Rooftop for capturing rain- 11,080 sq m

Installation Cost: Rs.12 lakhs

Results:

- Ground water table raised significantly in last 4-5 yrs
- Reduction in depth to water table from 21.1m to 16.6m
- Improvement in quality of water



Reliance Infra: Water Efficiency

Dahanu Thermal Power Plant

Problem:

- "Autogenously Combustion" of coal in stock piles & spontaneous fires- Huge water requirement

Intervention:

- Implementation of Rain guns at coal handling plant

Cost : Rs. 7 lakhs

Results:

- Water saving of 96000 m3/year
- Reduction in CO2 emission
- Reduced windage loss of coal @ 0.5%

SOCIAL INITIATIVE by IKEA in association with Advit Foundation, AL Paper house, DT Ceramics & Village Communities

- Project goal – To address the water requirements for the factories and village communities through water shed development in 5 pilot villages in and around the factory

- Project outputs –
  - Formation of Water User Groups in 5 villages to manage their water resources
  - Training and education to the WUG to implement the proposed development plan
  - Design and construction of water harvesting structure at 5 villages

IMPACTS ON 5 VILLAGES – BHIMPURA , KIRATPURA, SANWAL, NAVALKISHOREPURA, CHANDAWAS

COMMUNITY INVOLVEMENT

Contribution by villagers in kind

Ownership of the structures by WUG

Replication of the project in neighbouring villages through further training and creation of WUGs

COMMUNITY EMPOWERMENT

WUGs were trained to maintain the constructed check dams in each of the villages

They were empowered to dovetail the village initiatives with ongoing Government programmes

SOCIAL IMPACT

Improvement in the water table /water presence for more than 5 months in the villages

Improvement in soil moisture /cropping pattern has become twice a year and there by

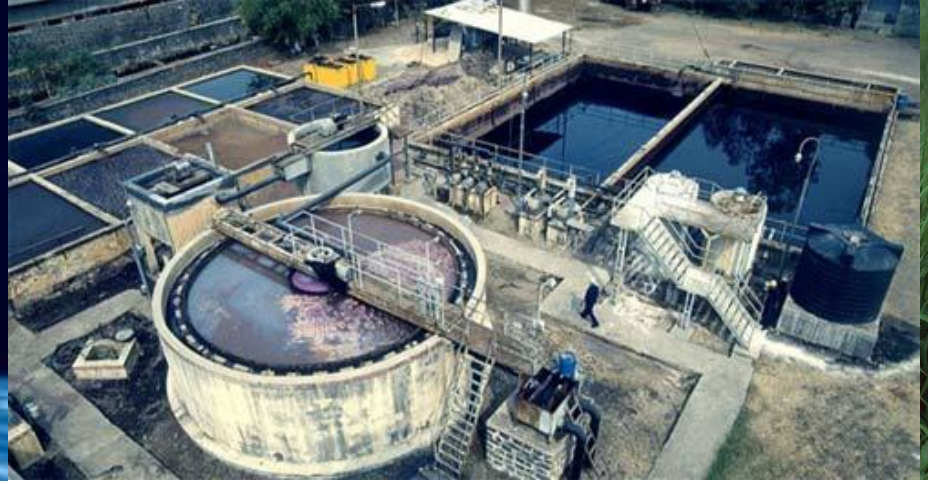
increase in income

WATER BENEFITS

Recharge of 1Km radius land area

Each structure would support 4 nearby villages

More than 2000 people will get benefited from each structure


CASE STUDIES ON WATER CONSERVATION FROM INDIAN INDUSTRY


EXAMPLES FROM CEMENT INDUSTRY

WATER AND WASTEWATER CONSERVATION

BINANI CEMENT LIMITED

Binani

Excellence in Water Management

42%
Reduction in Specific Water Consumption

Year	Sp. water Cons. (Cement plant + CPP)	Specific water Cons. (Cement plant only)	Per capita consumption (Colony Domestic)	Per capita consumption (Plant Domestic)	Waste Water Discharge (for Green Belt)
	M3/T Cement	M3/T Cement	M3/Person/day	M3/Person/day	M3/T Cement
05-06	0.471	0.159	0.160	0.057	0.010
06-07	0.359	0.141	0.153	0.051	0.010
07-08	0.365	0.165	0.144	0.055	0.010
08-09	0.272	0.135	0.128	0.053	0.009

CII

BINANI CEMENT LIMITED

Binani

Innovative Water Saving Projects

Installation of Air Cooled Condensers in CPP

1. 2 Nos. of Air Cooled Condensers installed (07-08 & 08-09)
2. **90% or 3800 M3/day water saving**
3. Equivalent reduction in waste water generation
4. Investment – 25 Crores
5. Savings – 1.29 Crores PA
6. Reduced social & legal liability

BINANI CEMENT LIMITED

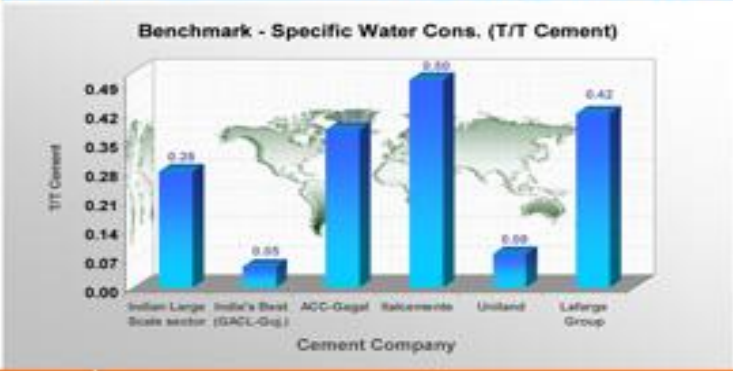
Binani

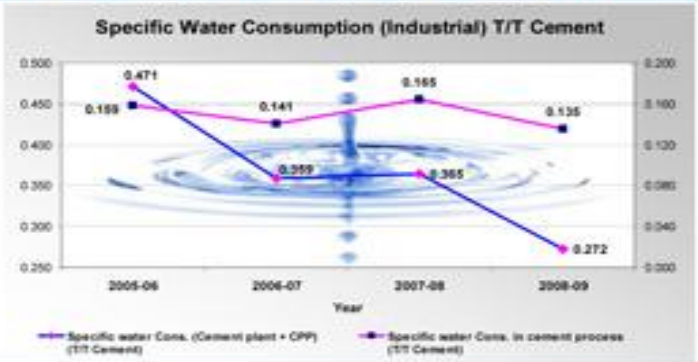
Comparison with National & International Benchmarks

Specific Water Consumption (M^3/ T Cement)

National Benchmark	International Benchmark	Our Status	
		(08-09)	Current
0.050 – GACL Gujrat Unit	0.050 – GACL Gujrat		
0.28 (Indian average for large cement plants)	0.08 - Uniland Cement (International company)	0.135	0.09

Source: CSE Green Env. Rating for Indian Cement plants - 2005 (Large Category)



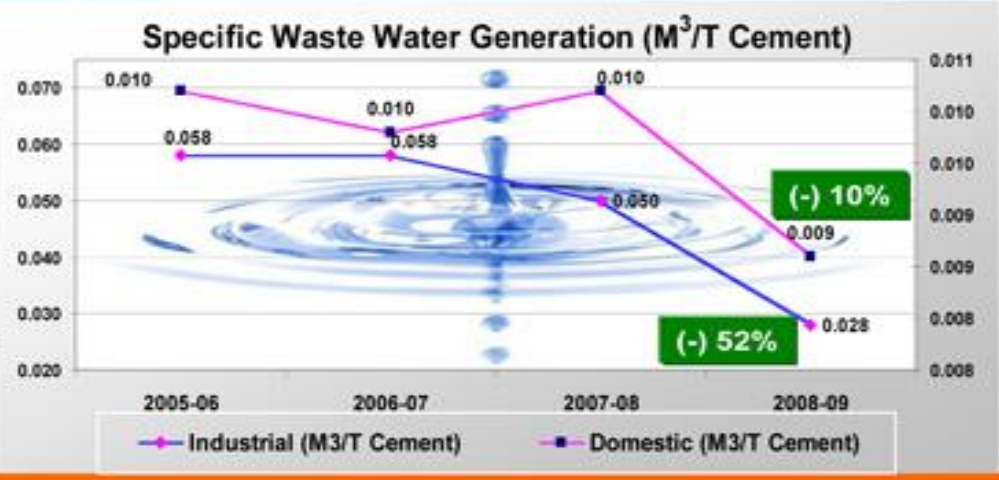


CII

BINANI CEMENT LIMITED

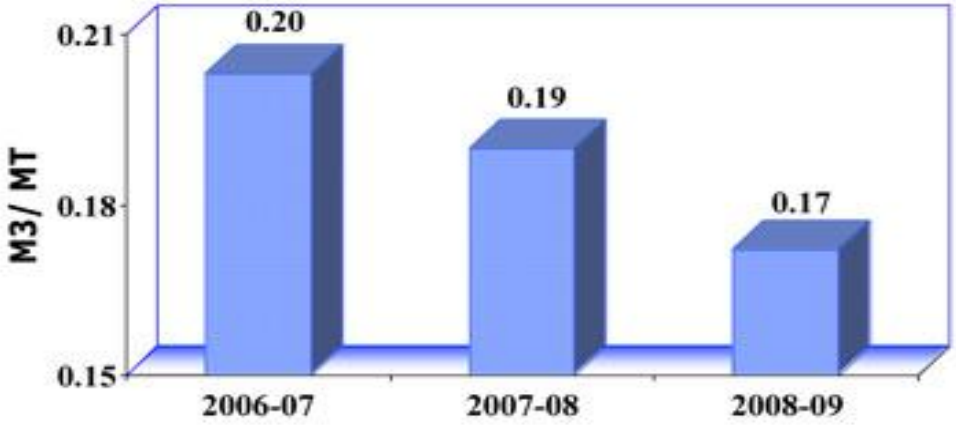
Waste Water Management

Year	Industrial Waste Water			Domestic Waste Water		
	M^3	M^3/T Cement	%	M^3	M^3/T Cement	%
2005-06	135175	0.058	100	23573	0.0102	100
2006-07	141435	0.058	100	23863	0.0098	100
2007-08	147029	0.050	100	30268	0.0102	100
2008-09	106821	0.028	100	33028	0.0086	100



SHREE CEMENT LIMITED

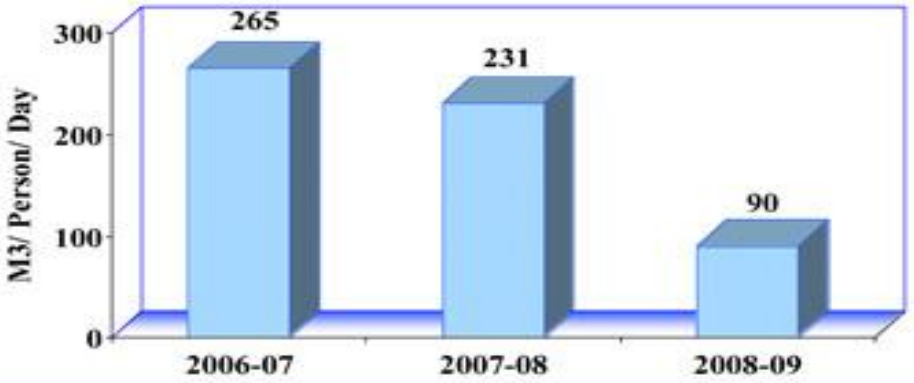
Sustainability Drive



Specific Water Consumption

Per Capita Water Consumption

(Industrial Use)



Water adds value to people & organization, Conserve it intelligently

SHREE CEMENT LIMITED

Water Conservation Projects – Case Study 1

Waste Heat Utilization of Preheater Unit-I

Preheater Gas 300 - 400°C, 180 - 250 Kcal/Kg

≃ 1000 KLD Water Used in GCT

To Save these loses, Shree has installed vertical co-flow boiler at Preheater-I.

Water consumption is ≃ 300 KLD in GCT

Before WHRB

After installation of WHRB

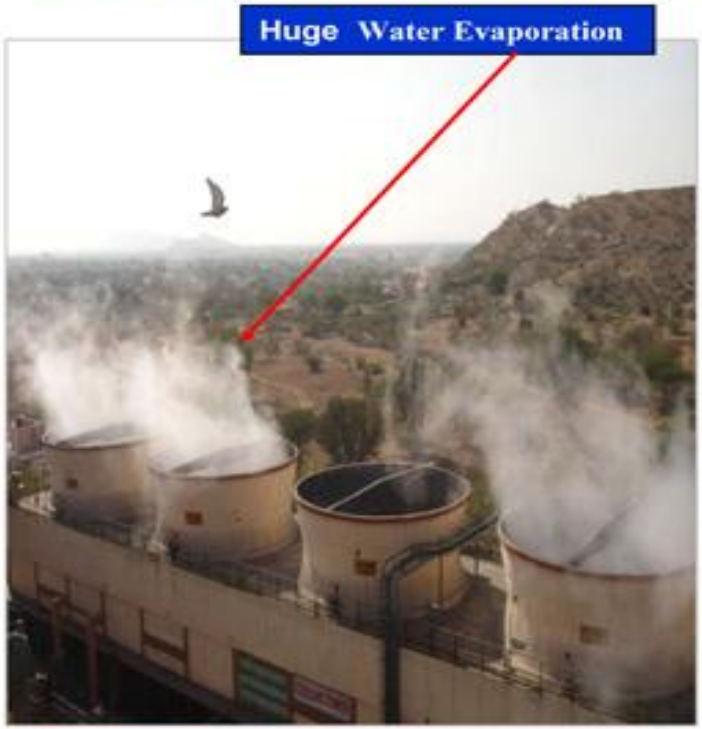
- Water Saving 700 KLD
- Fuel Saving 20974 ton/ annum
- Reduction of CO_2 Emission 78,000 ton/ annum

Water adds value to people & organization, Conserve it intelligently

SHREE CEMENT LIMITED

Water Conservation Projects – Case Study 2

Air Cooled Fluid Condenser at Power Plant



Conventional Cooling Tower

Air Cooled Fluid Condenser for 2 MW

Contd

Water adds value to people & organization, Conserve it intelligently

SHREE CEMENT LIMITED

Water Recycling Practices

II RO Plant

Earlier one RO plant for production of Boiler feed water which generated 45 KL/hr reject of high TDS as waste.

Installed Second R.O. unit with the capacity of 27 KL/hr and recovery is 67%

Reject of RO-2 is used in Gas Conditioning Tower to cool down the pre heater exit gas temperature.

Overall water recovery of this plant is **100%.**

Shree Cement-Shree Power is a combination of zero water disposal on land.

Water adds value to people & organization, Conserve it intelligently

SHREE CEMENT LIMITED

Water Recycling Practices

STP (400 KLD Capacity)

Sewage treatment plant has resulted in saving of 55000 m3 of water annually.

For plantation STP treated water is used inside plant & colony which resulted in saving of 39314 M3 fresh water in 2008-09

Recently installed an Aerobic sludge digester in STP for the following benefits-

- Lower BOD in sludge
- Odourless, humus like, biologically stable sludge.
- Recovery of more of the basic fertilizer values in sludge.

Treated sludge is also being used as manure for plantation.

Water adds value to people & organization, Conserve it intelligently

Shree Cement, Beawar

- ***Reduction in water consumption by installing waste heat recovery unit. 700 KL/day savings***
- ***Air Cooled Fluid Condenser at Power Plant, 2500 KL/Day water savings***
- ***Second RO put up to treat the reject of RO I used for boiler feed water. Reject of RO II is used in gas conditioning tower instead of fresh water.***
- ***Treated water from STP used for plantation (ANNUAL FRESH WATER SAVINGS 39314M^3).***

EXAMPLES FROM PAPER INDUSTRY

WATER AND WASTEWATER CONSERVATION

ITC TRIBENI

Fresh Water Consumption

(April – March)	Quantity , m3		Production in Tonnes	Specific water consumption, m3/MT
	Industrial	Domestic		
2004-05	2532351	132168	23667	107
2005-06	2516196	126974	24024	105
2006-07	2395356	1150734	24250	99
2007-08	2114830	1131597	23387	90

ITC TRIBENI

Fresh Water Consumption

Benchmarking

Tribeni Mill	National Benchmark	International Benchmark	CPCB Norms
90 m^3/T	Not Available	100 m^3/T	150 m^3/T (w.r.t waste water norms of 120)

Best Available References of European Countries from the "BREF Pulp and Paper", electronic adaptation of the European reference document on Best Available Techniques (in the slant of reducing the aggressions to man and environment) in the Pulp and Paper manufacturing industry.

ITC TRIBENI

Implemented Projects 07-08

Scheme 1

Old System:	New System:
F/water requirement 30 m3/hr.	F/water requirement 30 m3/hr.
Water sent back to Overhead Tank : Nill	Water sent back to Overhead Tank : 30 m3/hr
Actual cooling Water consumed : 30m 3/hr	Actual cooling Water consumed : Nil

Savings : 237600 m3 / year

Investment Rs.0.2 Lakhs

ITC TRIBENI

Implemented Projects 07-08

Scheme-2: Reduction of sealing water in Couch of PM4 by use of Anti friction bearing

Savings : 31680 m3 / year

Investment Rs. 9 Lakhs

ITC TRIBENI

Implemented Projects 07-08

Scheme3: Refurbishing of PM4 steam & condenser circuit

Old System:

Steam requirement : 110 TPD

Condensate recovery : 39 TPD

Water requirement : 71 TPDr

New System:

Steam requirement : 80 TPD

Condensate recovery : 56 TPD

Water requirement : 21 TPD

Water saving : 50 TPD

(This saving would come in DM water)

Savings : 49500 m3 / year (DM water)

Investment Rs. 120 Lakhs

ITC TRIBENI

Implemented Projects 07-08

Scheme 7:

Reduction of leakage of Gland sealing water through use of Mechanical seals

Savings : 15840 m3 / year

Investment Rs. 24 Lakhs

ITC TRIBENI

Implemented Projects 07-08

Scheme 8:
Use of highly efficient imported Vacuum Pumps requiring less sealing water

Before Modernisation

After Modernisation

Savings : 23760 m3 / year

Investment Rs.57 Lakhs

ITC TRIBENI

Implemented Projects 07-08

Scheme 9:
Reduction in consumption of Make up water in Cooling Tower by improving COC

Old System:	New System:
For TG2	For TG2
Evaporation loss: 11 m3/hr	Evaporation loss: 11 m3/hr
Blow down : 27.5 m3/hr	Blow down : 5.5 m3/hr
Total make up water : 38.5 m3/hr	Total make up water : 16.5 m3/hr
For TG3	For TG3
Evaporation loss: 14.7 m3/hr	Evaporation loss: 14.7 m3/hr
Blow down : 36.7 m3/hr	Blow down : 7.4 m3/hr
Total make up water : 51.4 m3/hr	Total make up water : 22 m3/hr
Total make up water reqd.: 89.9 m3/hr	Total make up water reqd.: 38.5 m3/hr

Savings : 50 m3 / hour

Investment Rs. 40 Lakhs

ITC TRIBENI

Waste Water Discharge

Waste Water Discharge - Benchmarking

Tribeni Mill	National Benchmark	International Benchmark	CPCB Norms
61.5 m^3/T	Not Available	60 m^3/T	120 m^3/T

Best Available References of European Countries from the "BREF Pulp and Paper", electronic adaptation of the European reference document on Best Available Techniques (in the slant of reducing the aggressions to man and environment) in the Pulp and Paper manufacturing industry.

EXAMPLES FROM POWER INDUSTRY

WATER AND WASTEWATER MANAGEMENT

Reliance Infra: Water Efficiency

Dahanu Thermal Power Plant

Problem:

- *"Autogenously Combustion" of coal in stock piles & spontaneous fires- Huge water requirement*

Intervention:

- *Implementation of Rain guns at coal handling plant*

Cost : Rs. 7 lakhs

Results:

- *Water saving of 96000 m3/year*
- *Reduction in CO2 emission*
- *Reduced windage loss of coal @ 0.5%*

ABAN: Water Efficiency In Power

Gas Based Combined Power Plant, Tamil Nadu

Initiatives:

- *Dry low NOx burners v/s other NOx burners*
- *Air cooled condensers in place of conventional cooling towers*

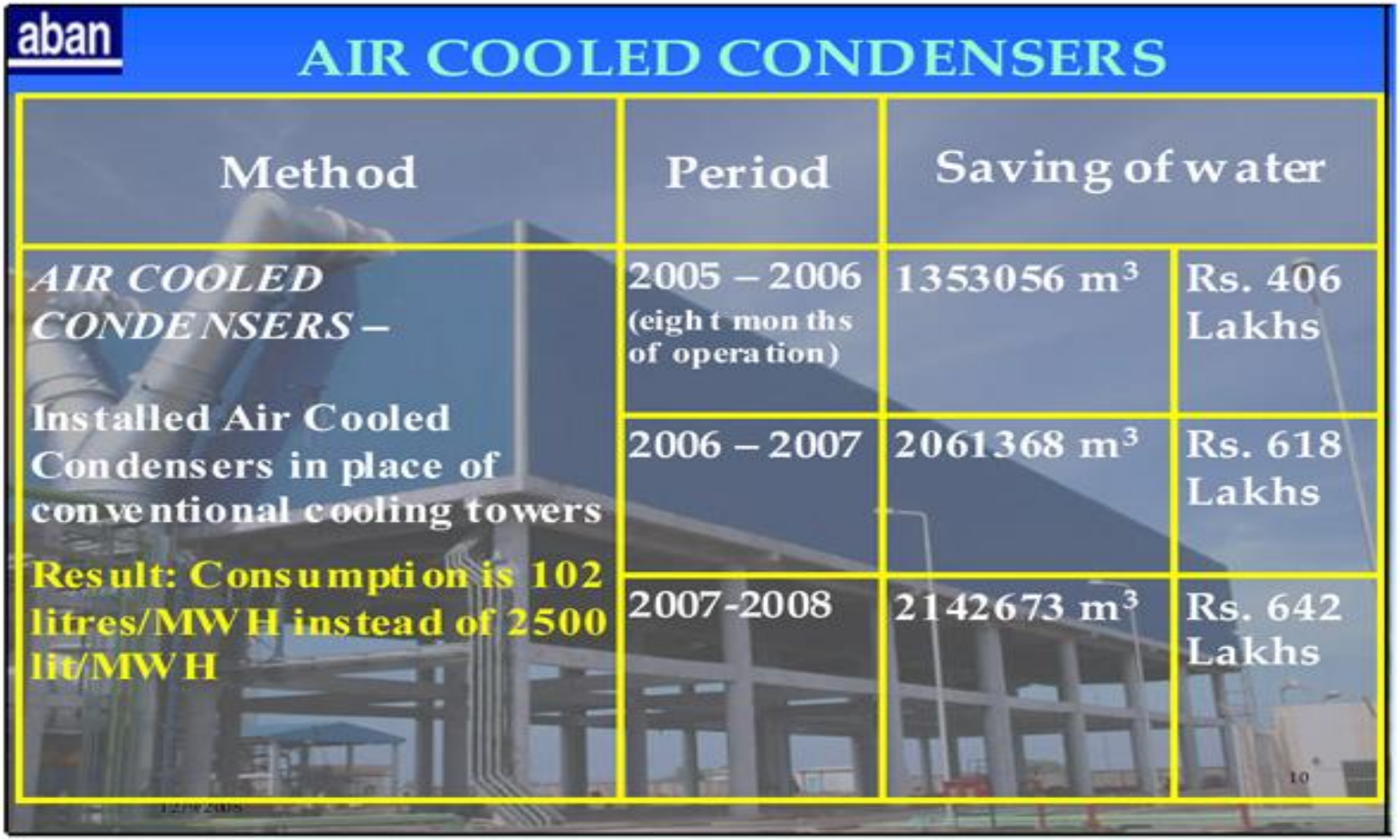
Benefits:

- *Water consumption: Reduced from 2500ltr/MWH to 102ltr/MWh*
- *Reduction of NOx from 1402 Kg/day to 374 Kg/day*

TERI Corporate Award for "Environmental Excellence & Corporate Social Responsibility" June 2009.

Period	Water saving (Mn Ltrs)	Money saving (Rs Cr.)
2005-06 (8 months)	1353	4.1
2006-07	2061	6.2
2007-08	2142	6.4

ABAN POWER



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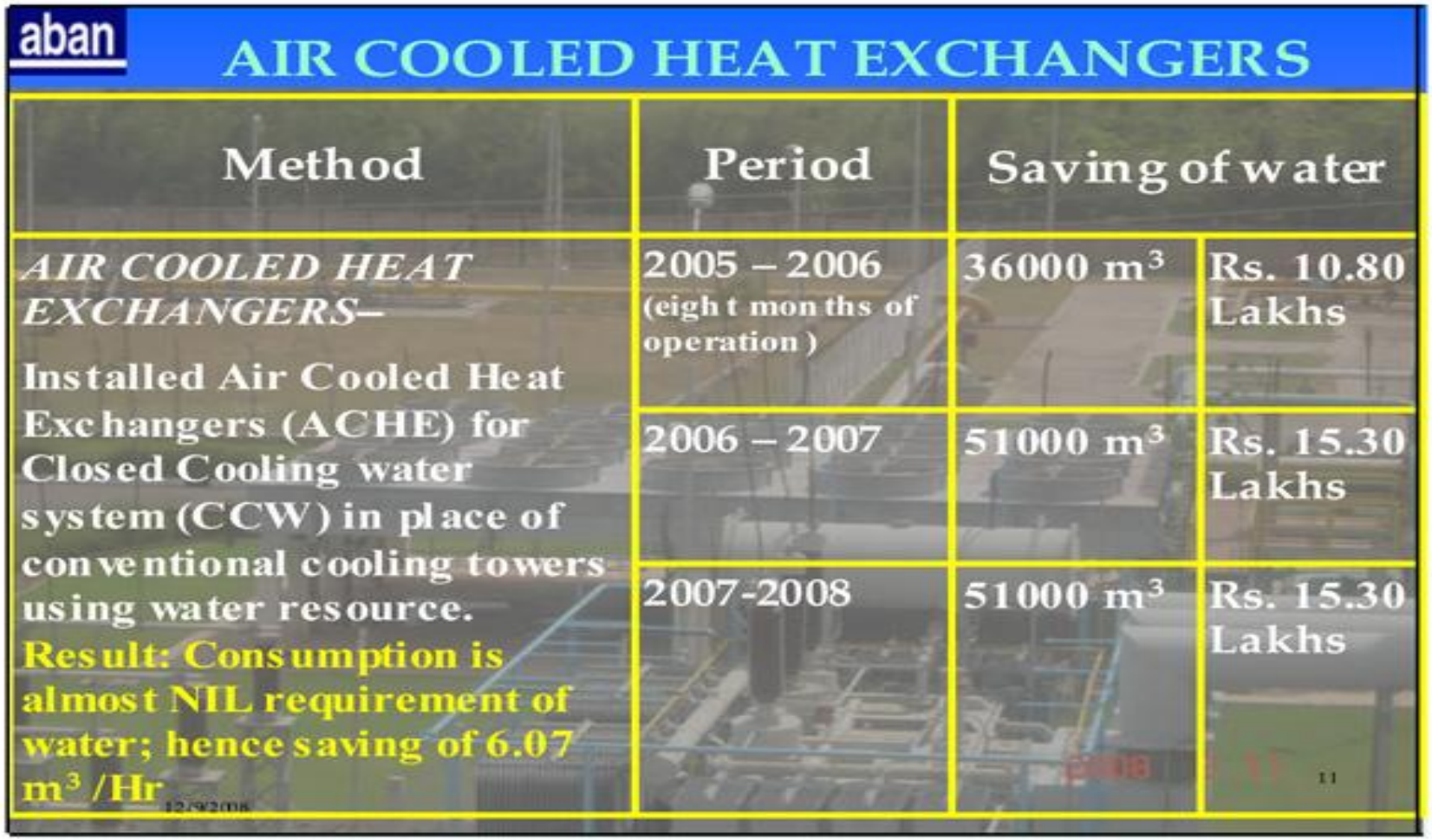

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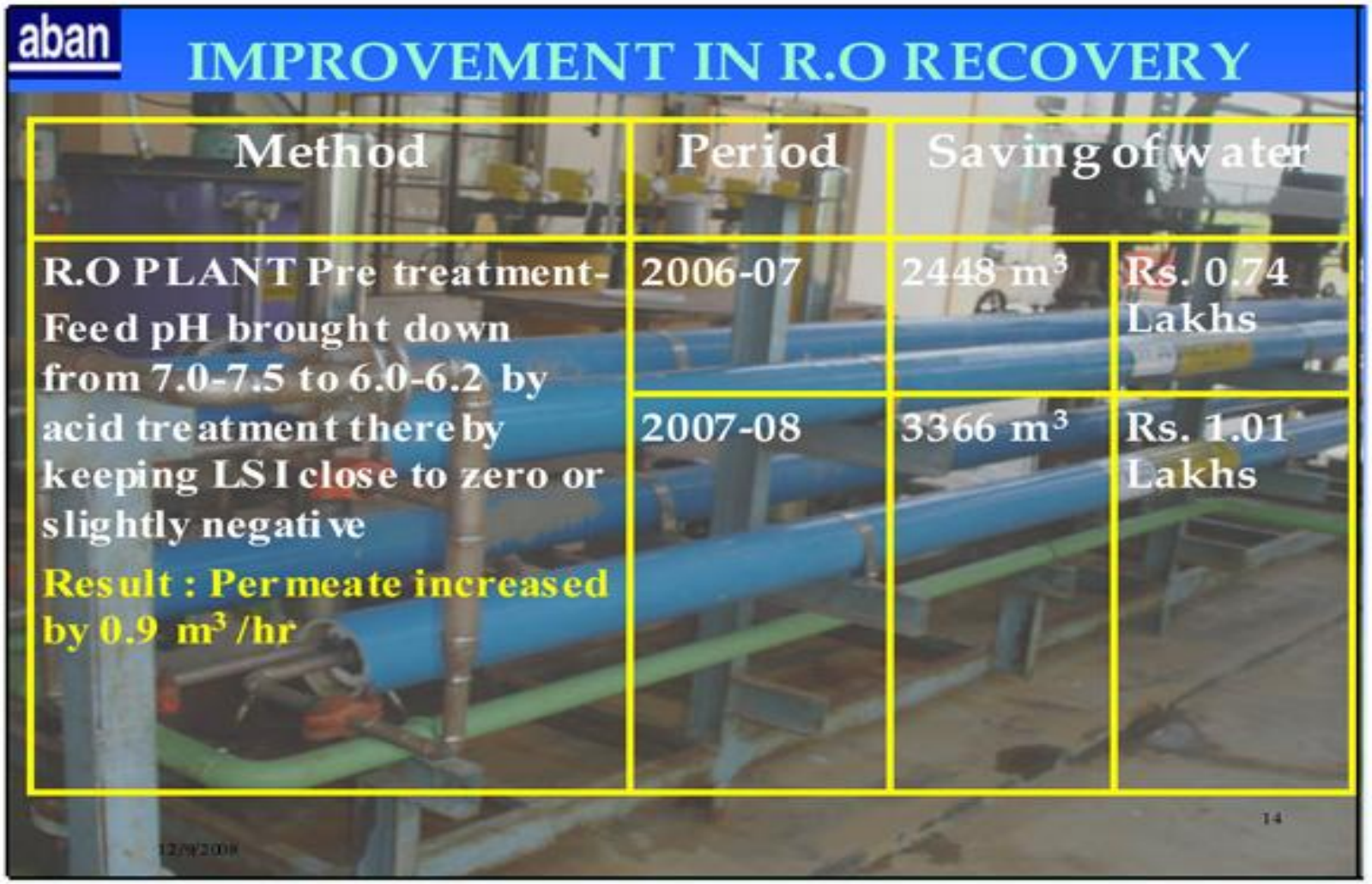

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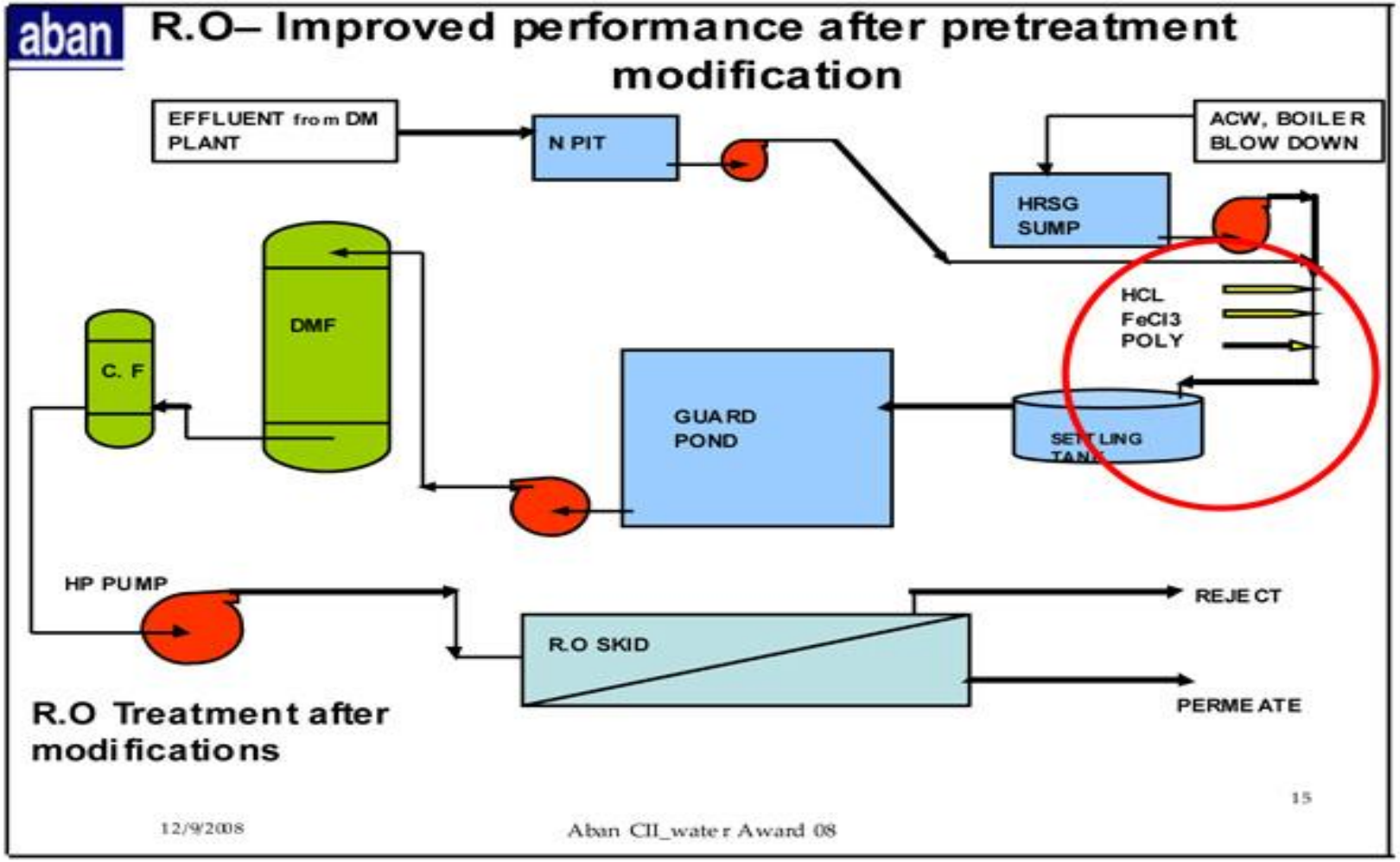

ABAN POWER

ABAN POWER

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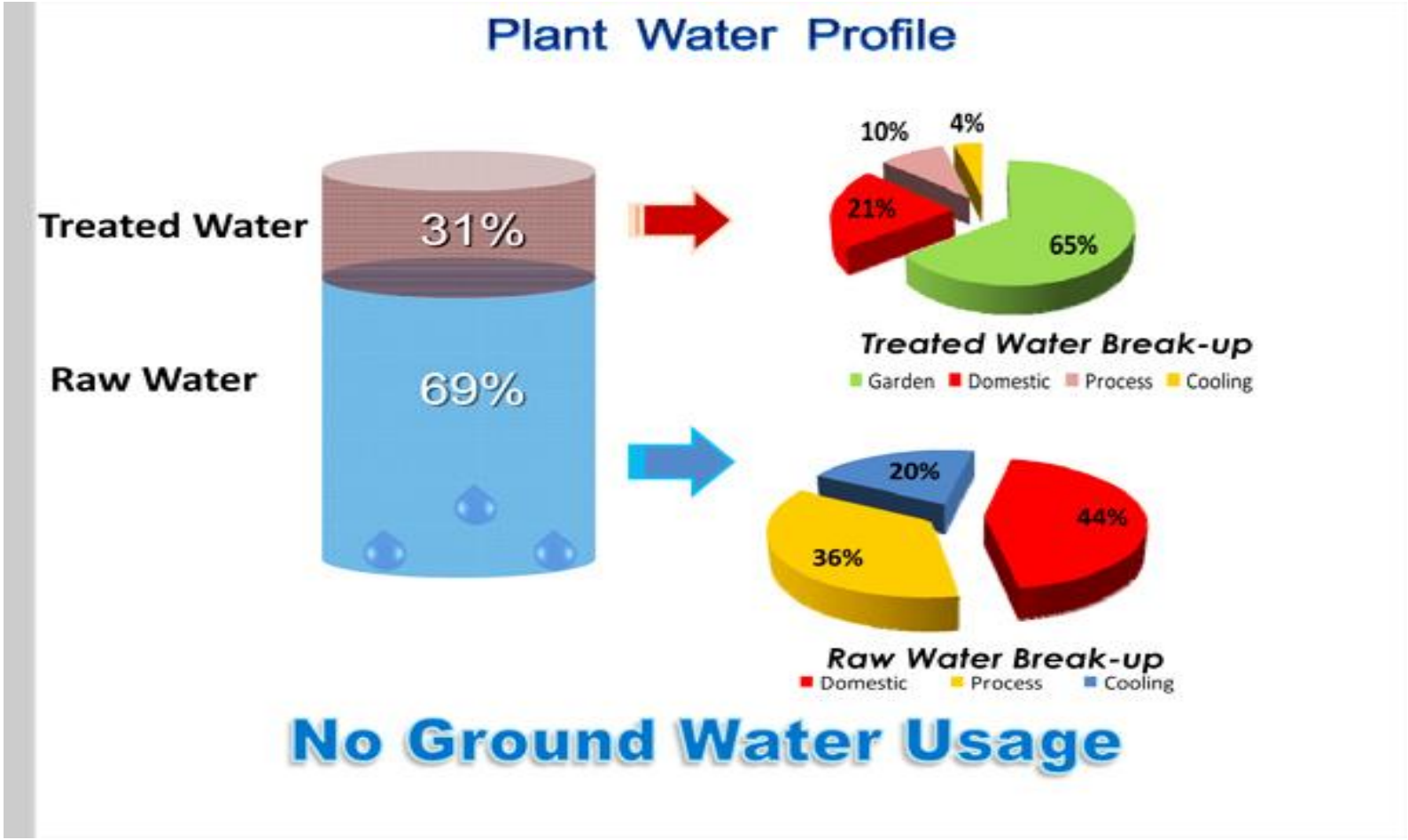
SPECIFIC WATER CONSUMPTION

Year	Annual Water Consumption (M^3)	Generation (MWh)	M^3/ MWh
2005 – 06 (8 months)	45200	564298.49	0.08
2006 - 07	45270	858903.454	0.057
2007 - 08	25390	893525.054	0.0284

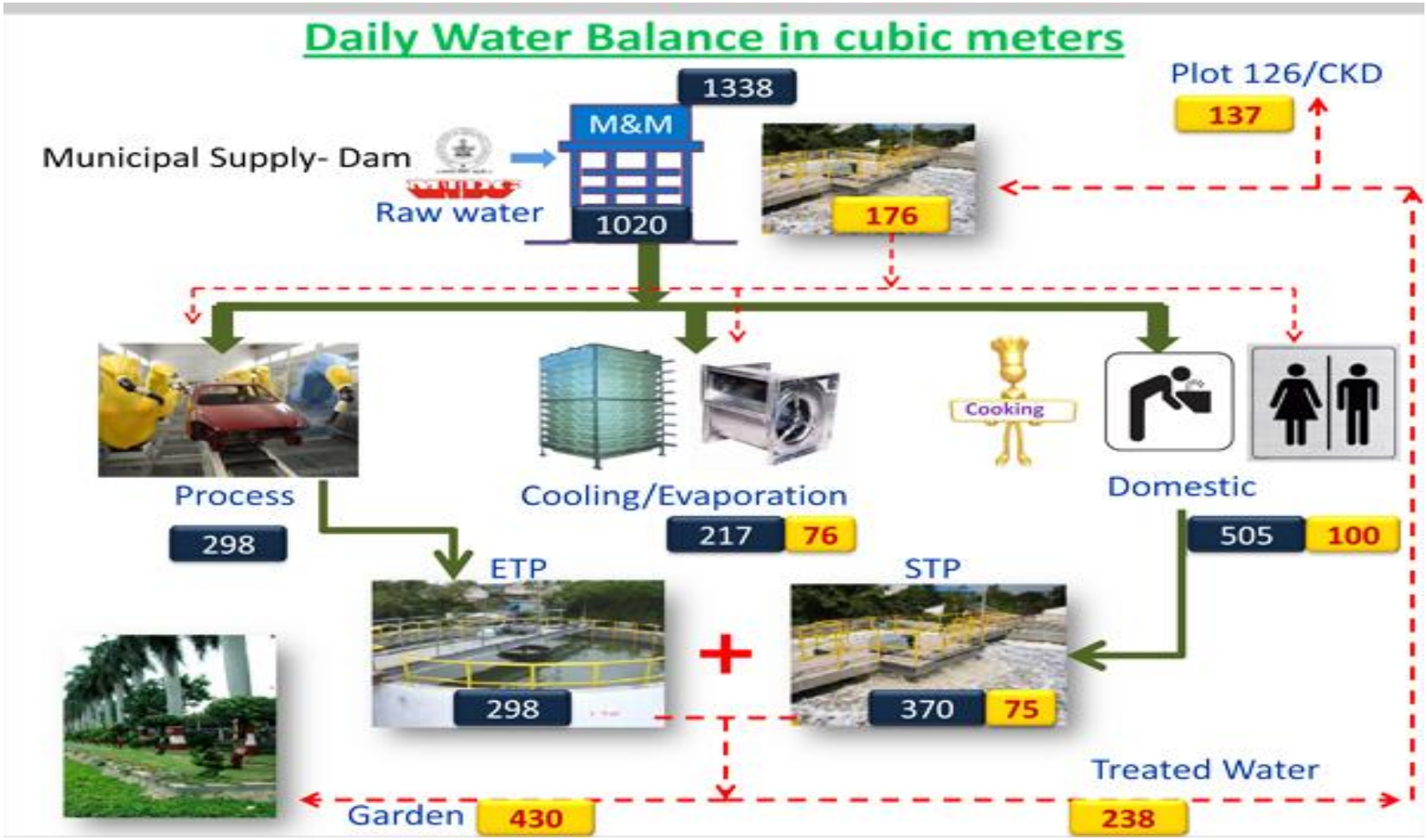
EXAMPLES FROM AUTOMOBILE INDUSTRY

WATER AND WASTEWATER MANAGEMENT

M&M Nashik Plant



M&M Nashik Plant



M&M Nashik Plant

Water Saving Initiatives

Fire Hydrant water saving during trials

Before

After

Benefits:

- Water saving during Daily fire hydrant post trial.- **1020 cum/annum**
- Water blown is watered to the plant
- Total 170 fire hydrant post with 63 mm opening diameter
- New reducer is of 3/8" size opening.

M&M Nashik Plant

Natural Draft Cooling

- Before
  - Three forced cooling draft towers

- Now
  - Now use of natural cooling towers less drift losses

Investment in lacks:	1.6
Annual Saving in Cubic meter:	1800

M&M Nashik Plant

Benchmarking – National & International

	Ford India	MPCB	Mahindra Nashik
SWC M3/vehicle	2.00	2.74	1.96

	Toyota Motor	Mahindra, Nashik
Specific Water Consumption M3/vehicle	3.44	1.96

Target 2011 is 1.85

Target 2015 Become water positive

*:- S abad.

**: Mahar sh a ollution Control Board

M&M Nashik Plant

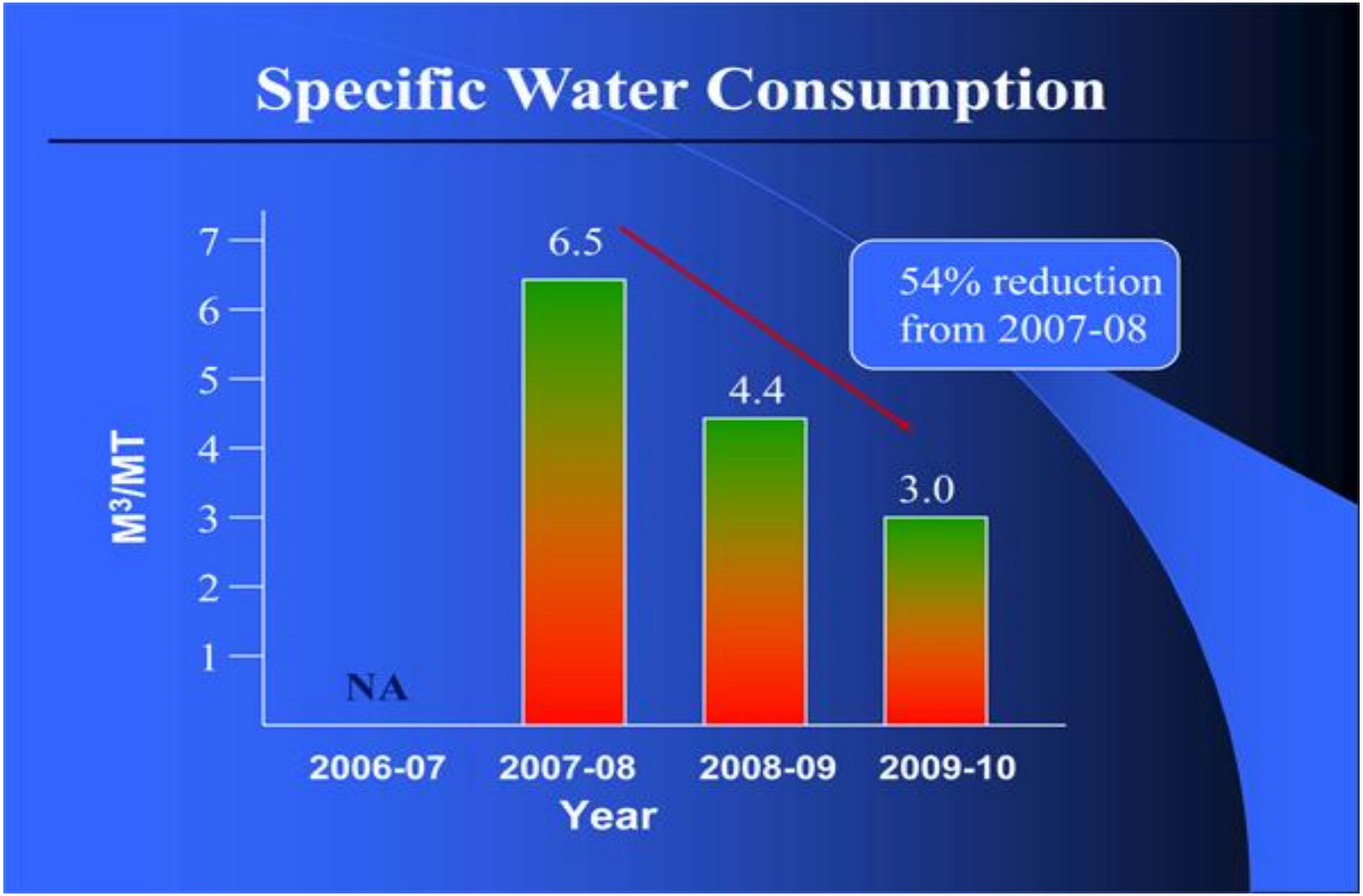
Benchmarks for Wastewater Discharge

	National Benchmark	International Benchmark	MPCB Benchmark	Mahindra Nashik
M3/vehicle	*Ford India-0.67*	*Renault-0.5*	0	0

EXAMPLES FROM PAPER INDUSTRY

WATER AND WASTEWATER MANAGEMENT

SRIPATHY PAPER BOARDS



SRIPATHY PAPER BOARDS

Comparison with National and International Benchmark on Water Consumption

	National Benchmark	International Benchmark	CPCB Benchmark	SRIPATHI'S ACHIEVEMENT
Specific water Consumption M^3/MT	6	6	7	3

ALREADY ACHIEVED INTERNATIONAL BENCHMARK

SRIPATHY PAPER BOARDS

Comparison with National and International Benchmark on Waste Water Discharge

	National Benchmark	International Benchmark	CPCB Benchmark	SRIPATHI'S ACHIEVEMENT
Specific water Consumption M^3/MT	5	5	6	0.147

ALREADY ACHIEVED INTERNATIONAL BENCHMARK

SRIPATHY PAPER BOARDS

Water conservation projects implemented during April 2009 – March 2010 (project-1)

Title of water saving project implemented	Year of implementation	Annual water savings		Investment Made	Payback period (months)
		m^3	Rs. Lakhs	Rs. Lakhs	
HP shower of nozzle spacing 150mm with microtravel fixed speed oscillator instead of HP shower of nozzle spacing of 100 mm with microtravel variable speed oscillator 2 Nos.	2009-10	19200	2.112	1.60	9 months

Planned date of completion	Actual date of completion
Ist shower – 04-01-2010 2nd shower – 15-01.2010	04-01-2010 01-02.2010

SRIPATHY PAPER BOARDS

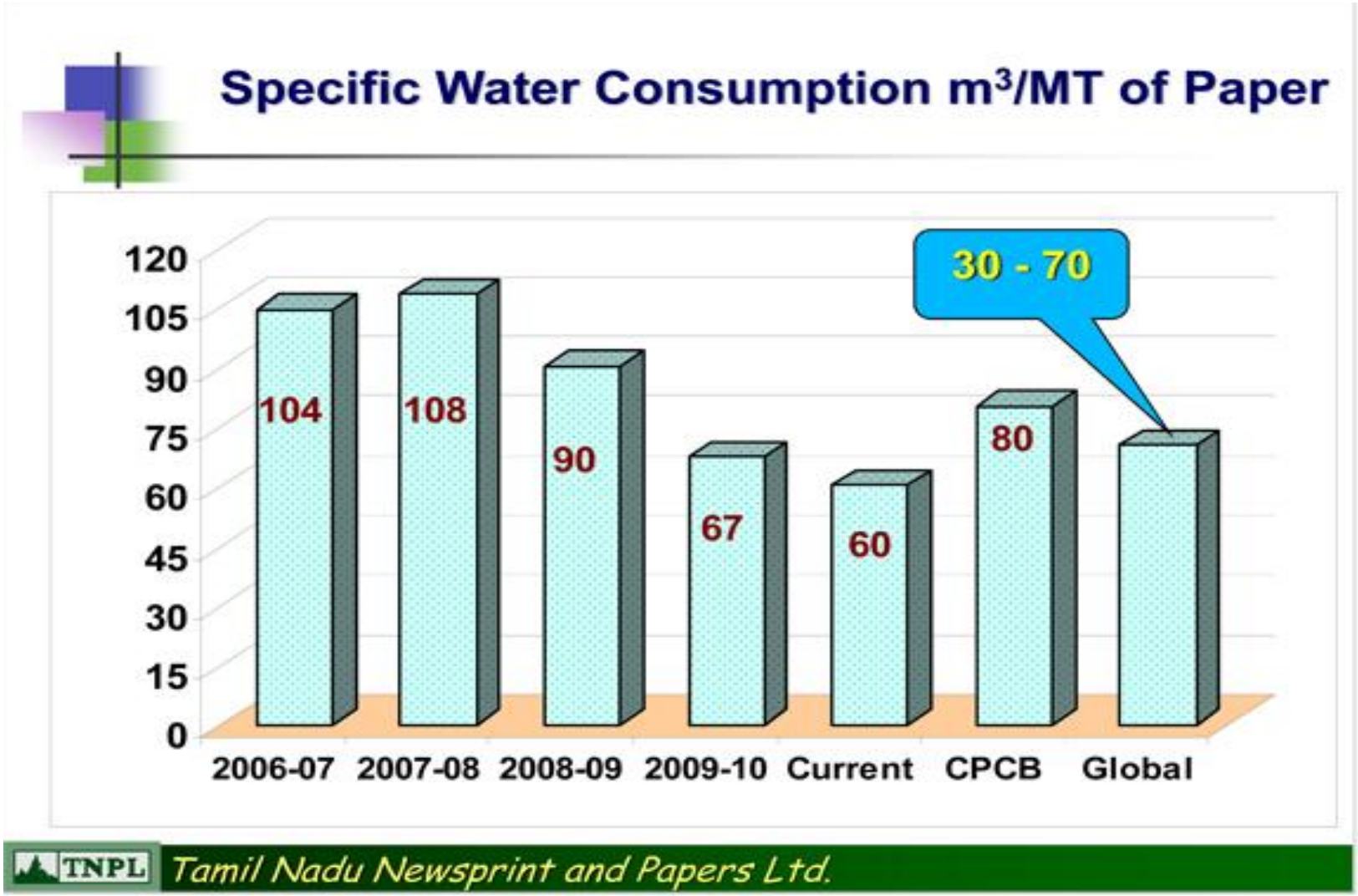
Water conservation projects implemented during April 2009 – March 2010 (project-2)

Title of water saving project implemented	Year of implementation	Annual water savings		Investment Made	Payback period (months)
		m^3	Rs. Lakhs	Rs. Lakhs	
Auto self cleaning filter of 40 m^3 per hour capacity with 100 microns opening	2009-10	25600	5.632	5.30	12 months

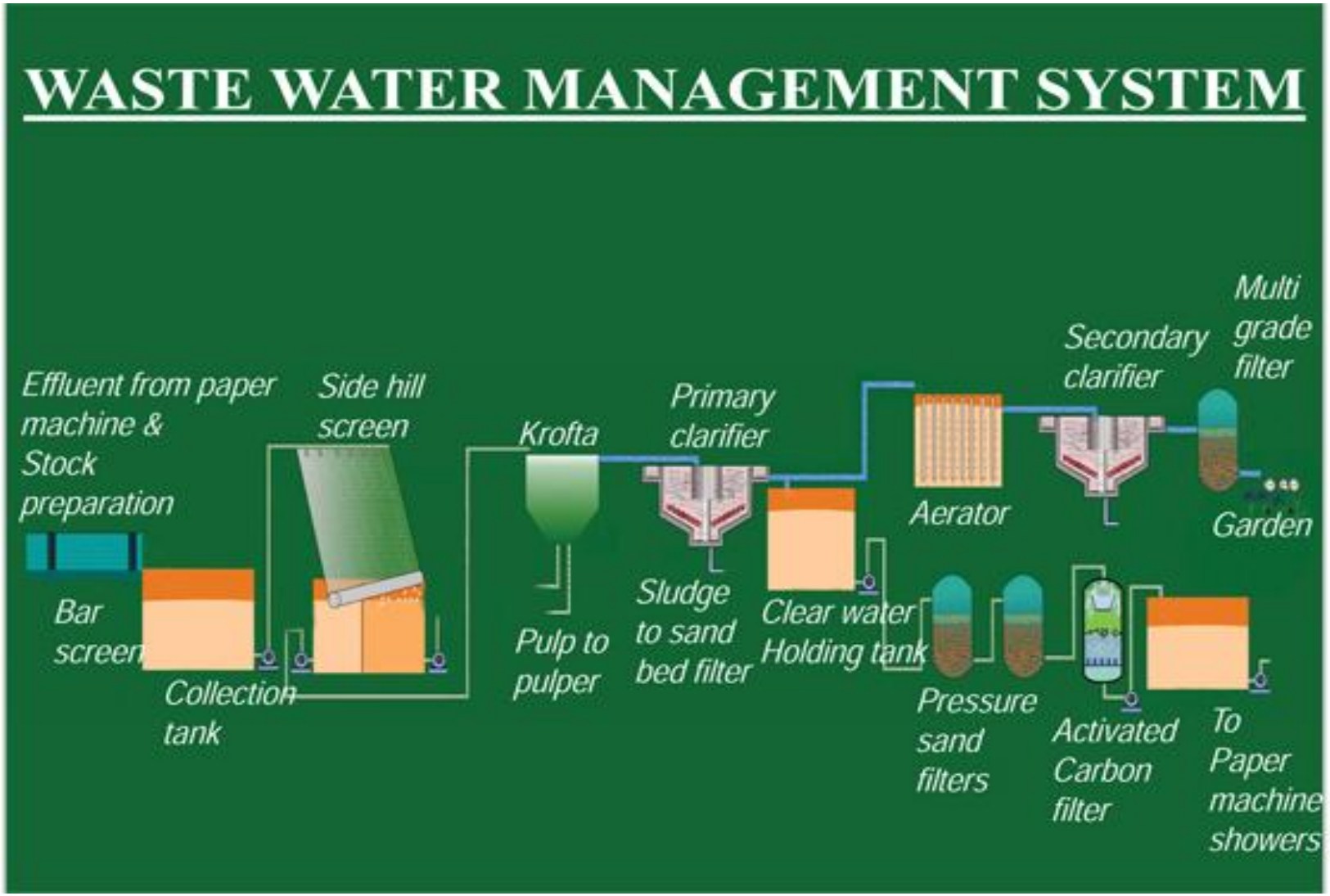
Planned date of completion	Actual date of completion

Note: Equipment brought on trial basis during end of Dec 2009 and commissioned during Ist week of Jan 2010. Seeing the good performance the equipment was retained and purchased on 17.02.2010

Tamil Nadu Newsprint and Papers Ltd



SRIPATHY PAPER BOARDS



EXAMPLES FROM OTHER INDUSTRY

WATER AND WASTEWATER MANAGEMENT

Water Conservation & Management in Wipro Limited

- **Water savings method adopted are:**
  - Installation of auto sensors for urinals and wash basins
  - Monitoring water leakage on daily basis
  - Adjustment of water pressure through control knobs
  - Sewage treatment plant & reuse of treated water for gardening/landscaping and toilet flushing
  - Implementation of rain water harvesting
  - Drip irrigation system in the office gardens
  - Regular communication to employees on water conservation

Saint Gobain Glass, Sriperumbudur

- **Collection of rooftop rain water in reservoir**
  - **Water harvested 1,50,000 m3/year**
  - **Fresh water cost savings Rs 5 million**
  - **Investment Rs 20 million**
  - **Payback period 48 months**
- **Waste water recycling – RO plant**
  - **Water saving : 37,450 m3/year**
  - **Investment : Rs.3.4 million**
- **Air cooled condensers**
  - **Water saving : 21,900 m3/year**
  - **Investment : Rs.11.7 million**

Innovations in Water Conservation

❖ Tata Chemicals Limited

- ➢ **Utilization of service boiler flue gas for neutralizing alkaline effluent of DM plant**
  - ❑ **Annual Water saving 10,000 M^3**
  - ❑ **Investment Rs 5.0 Lakhs)**
- ➢ **Replacement of drinking water header with UPVC in township**
  - ❑ **Annual Water saving 75,000M^3**
- ➢ **Recycling of Gas Turbine air condensate to cooling tower make up water**
  - ❑ **Annual water saving 80,000M^3**
  - ❑ **Investment Rs 3.0 Lakhs)**

RAIN WATER HARVESTING BY INDUSTRY

WITH IN THE FENCE

VASAVADATTA CEMENT

RAIN WATER HARVESTING

Soil Bunds and drains were created in such a way to ensure 100 % rain water from Mining lease area to mines pit.

Entire rain water from plant and colony area are diverted through drains with natural Slope to water pits.

Total capacity of all the pits are 37 Lacs m3 with present storage of 36 Lacs m3

SRIPATHY PAPER BOARDS

RAIN WATER HARVESTING

RAIN WATER STORING IN A QUARRY AND USING FOR INDUSTRIAL PURPOSE.

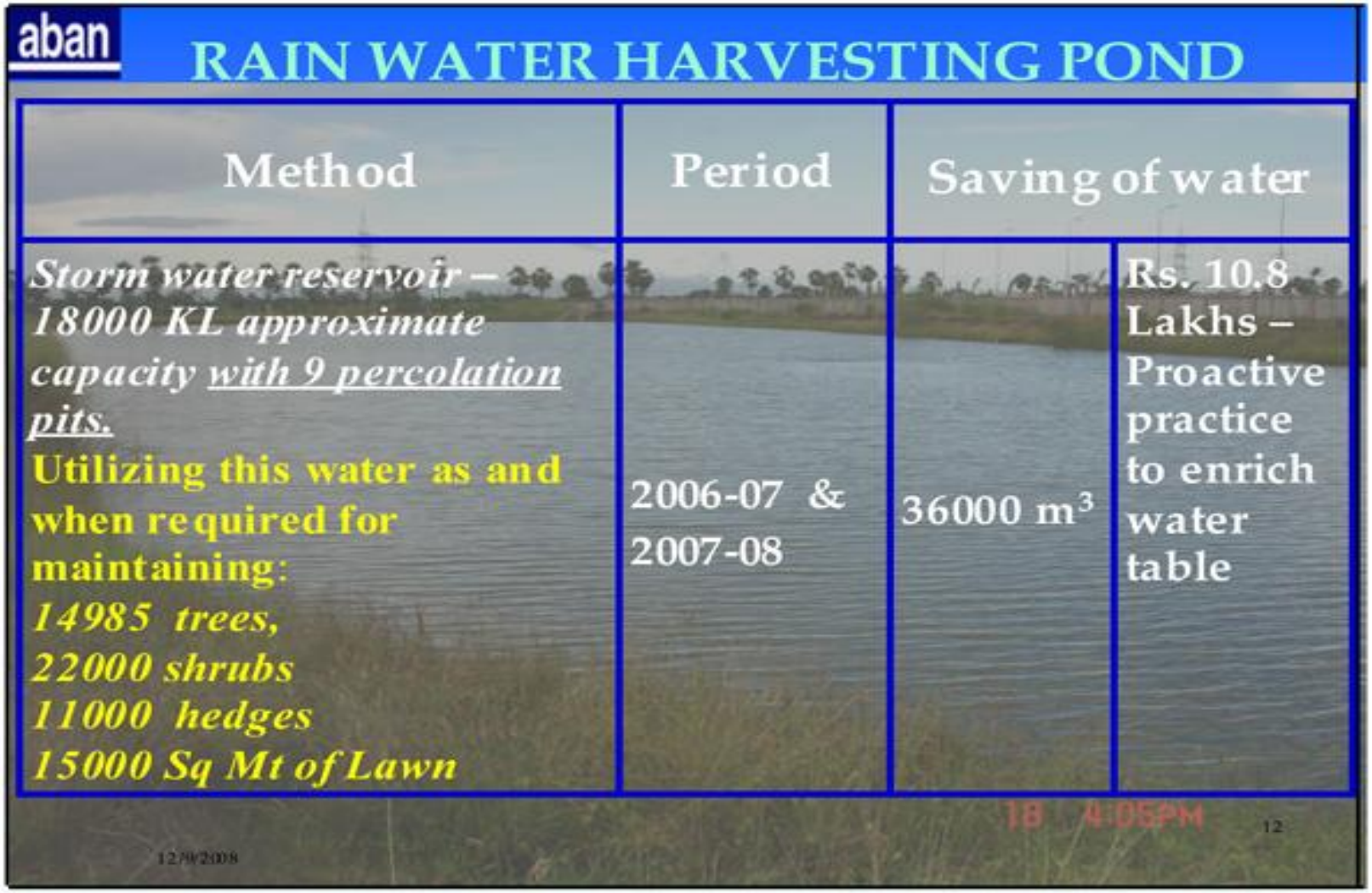
WELFARE FOR COMMUNITY

TREATED DRINKING WATER FOR VILLAGE

GREEN BELT

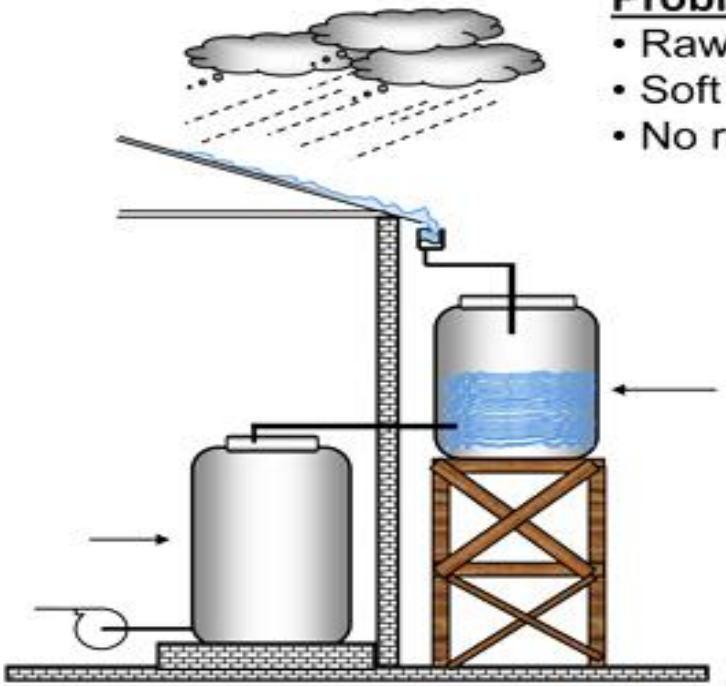
DEVELOPMENT OF GREEN BELT ALL AROUND THE FACTORY PREMISES BY GROWING MORE THAN 10,000 TREES.

ABAN POWER



M&M Nashik Plant

Water Saving Initiatives- Rain Water Harvesting



Problem description

- Raw water intake for paint shop is more
- Soft water consumption is more
- No rain water used in New Paint Shop

Benefit:

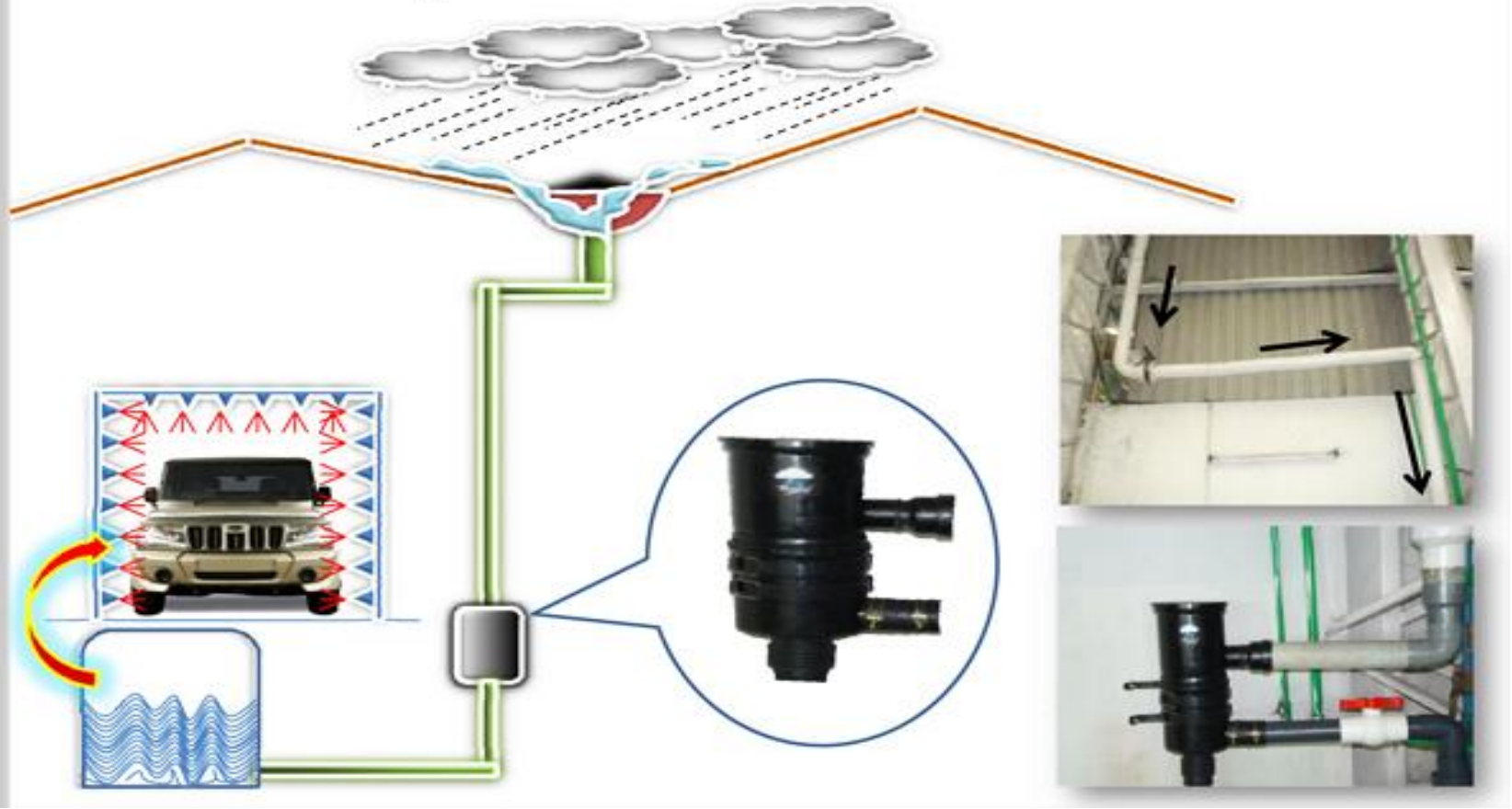
Total effective roof area: = 1000 m^2 Nashik Rain fall: 700 mm

Catchment of rain= **700 m^3** … for one down take pipe connected

M&M Nashik Plant

Water Saving Initiatives- Rain Water Harvesting

Rain Water Harvesting for Car Shower Test 30 m3 in this monsoon



M&M IGATPURI

Water Conservation Initiatives

Collection of water of roof area 20 M X 15 M

Special water collection arrangement

Clorination arrangement - Dozing pump

Water tank view

Mahindra Automotive Sector

Conservation of Energy, Preservation of Nature

ECON CELL - Igatpuri Plant.

13

Hero Honda: Rainwater Harvesting

Factory, Haryana

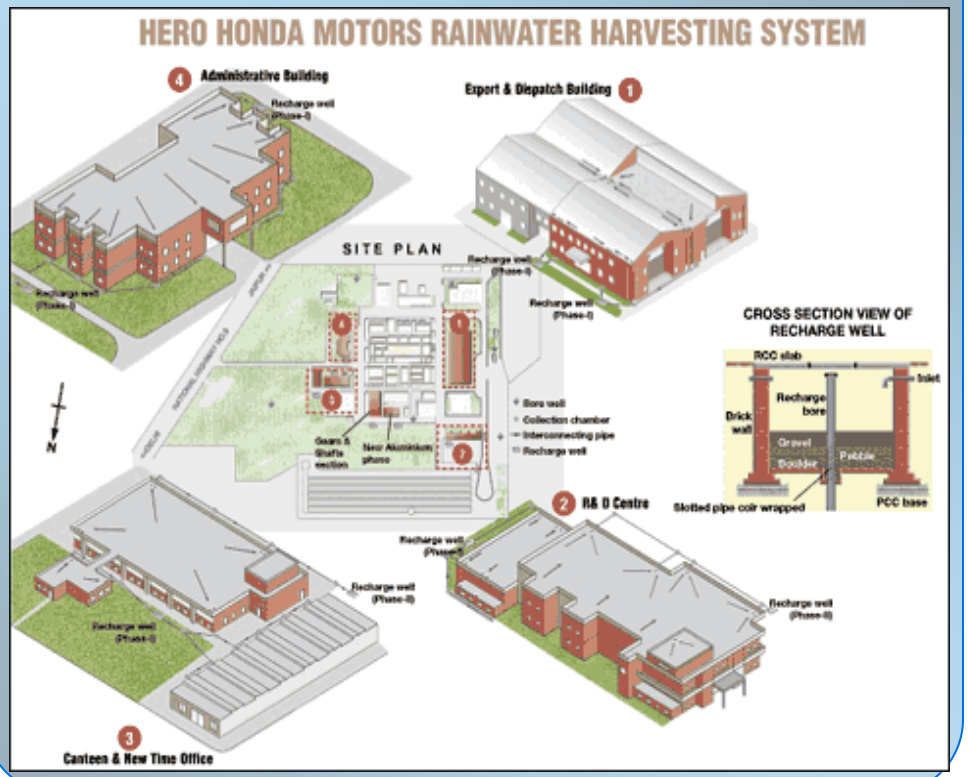
Area:

- *Rooftop for capturing rain- 11,080 sq m*

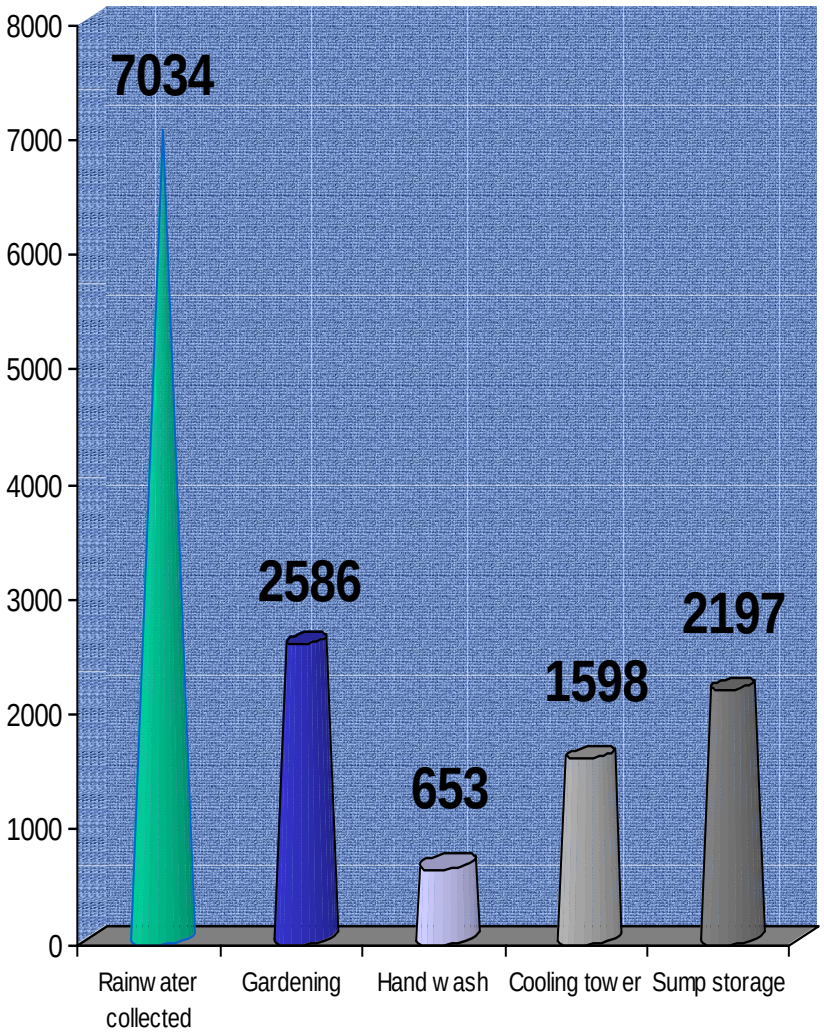
Installation Cost: Rs.12 lakhs

Results:

- *Ground water table raised significantly in last 4-5 yrs*
- *Reduction in depth to water table from 21.1m to 16.6m*
- *Improvement in quality of water*



RAIN WATER HARVESTING WIPRO EC – 123 BANGALORE



- Annual harvested water: 2254 KL
- Total 3 underground sumps each 100KL capacity
- Total cost of installation 1.2 million INR
- Drip irrigation system in the office gardens
- Regular communication to employees on water conservation

* CHART – Y axis –Water in Kiloliter

EXAMPLES FROM BEYOND THE FENCE ACTIVITIES

WATER SHED DEVELOPMENT

SHREE CEMENT LIMITED

Water Recharging Structures

Check Dam

At Village Lulwa

Near Village Jawangarh

At Sheopura-Kesarpura Mine Area

At Village Gaina Rampura

Water adds value to people & organization, Conserve it intelligently

SHREE CEMENT LIMITED

Water Recharging Structures

Water Shed Management Programme

- Formalized the Village Development Committee (VDC) for the development of overall natural resource management.
- Engaged an external NGO named "Sparsh" for consulting about Water Shed Development.
- Provide trainings to villagers regarding Roof Rain Water Harvesting, Best practices of cultivation etc.
- Projects are allocated to local contractors only this enhances the involvement of the community & employment.

Water adds value to people & organization, Conserve it intelligently

PEPSICO : Direct Seeding Of Paddy

Benefits

- *Reduction in water consumption by 30%*
- *Farmer saving- Rs.1500/ acre*
- *Improved seed planting density*
- *Methane emission reduction*
- *Opportunity to earn carbon credits*

Direct seeding machine developed by PepsiCo

Direct seeding in progress

120 days crop

2009 – Direct seeding- 6000 acres; water saved >5000 mn liters

ITC: Watersheds & Agri Development

Private, Public & Community Partnership (PPCP) In Rajasthan

Impact :

Farmer –
- *Higher yield, better quality produce*
- *30% increase in annual income*
- *Market linkage through e-chaupal*

Landless –
- *Decreased seasonal migration*

Nation –
- *Conservation of water and soil*

ITC Limited

ई-चौपाल
किसानों के हित में, किसानों का अपना

ITC's watershed development program covers 26,700 hectares in the country

SOCIAL INITIATIVE by IKEA in association with Advit Foundation, AL Paper house, DT Ceramics & Village Communities

- Project goal – To address the water requirements for the factories and village communities through water shed development in 5 pilot villages in and around the factory

- Project outputs –
  - Formation of Water User Groups in 5 villages to manage their water resources
  - Training and education to the WUG to implement the proposed development plan
  - Design and construction of water harvesting structure at 5 villages

IMPACTS ON 5 VILLAGES – BHIMPURA , KIRATPURA, SANWAL, NAVALKISHOREPURA, CHANDAWAS

COMMUNITY INVOLVEMENT

Contribution by villagers in kind

Ownership of the structures by WUG

Replication of the project in neighbouring villages through further training and creation of WUGs

COMMUNITY EMPOWERMENT

WUGs were trained to maintain the constructed check dams in each of the villages

They were empowered to dovetail the village initiatives with ongoing Government programmes

SOCIAL IMPACT

Improvement in the water table /water presence for more than 5 months in the villages

Improvement in soil moisture /cropping pattern has become twice a year and there by

increase in income

WATER BENEFITS

Recharge of 1Km radius land area

Each structure would support 4 nearby villages

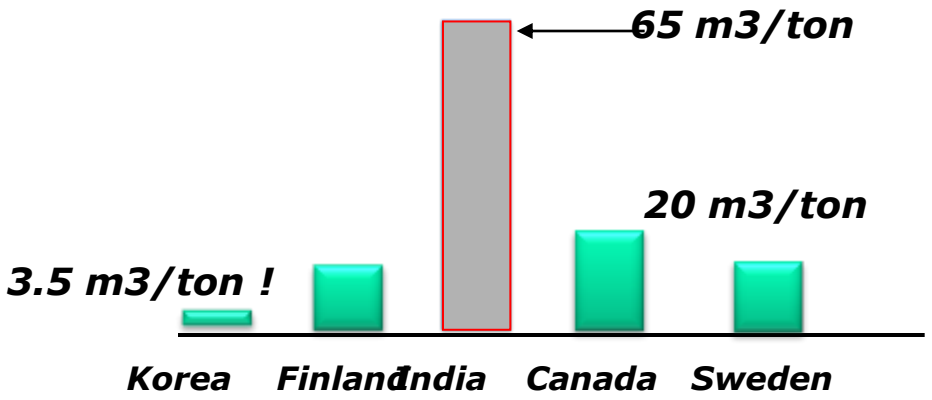
More than 2000 people will get benefited from each structure

POTENTIAL IN WATER EFFICIENCY IN INDIAN INDUSTRY

- ***Water saving potential in Indian industry***
  - ***35 – 50 %***
  - ***Excellent Potential to reduce, reuse and recycle***
  - ***Reduce water as well as conserve resources***

Eg: Pulp and Paper

Best figures in different countries



Thank you

Ramani Iyer

Pranab Dasgupta

"Working Group XII Plan Urban & Ind Water Supply & Sanitation"

Nirman Bhawan

New Delhi

12th May,2011