Water Management in Industries – Lessons from the CII Awards for Excellence

Mr LS Ganapati, after 31 years experience covering industrial customers, consultants while working for Large Private sector manufacturing organization continued consultancy in general management and quality management. He acquired status of Certified Lead Assessor on Quality Management Systems from PE Batalas UK and by way of Management Development Program became alumni of IIM Ahmedabad (1981).

Prior to taking up his own consultancy for the past 11 years, where he covered various sectors like textile, chemicals, electronics, retailing etc, he specialized in energy and quality management and attended World Energy Conference at Atlanta –USA in 1995

He is a Life Fellow of Institution of Engineers (India) with degree in Electrical Engg and MBA. He has been associated with Confederation of Indian Industries on Energy, Water and Environmental Management Awards, as Chairman. He is based in Chennai.

Excellence in industries through water management awards of CII

Contents of the presentation

- CII-Godrej GBC
- Gist of water awards
- Analysis of region wise / year wise achievement
- Important gains
- Within the fence and beyond the fence concept
- Major highlights
- Case Studies

What Is CII

- **An Apex Industry Association**
  - 116 year old organization
  - Over 8100+ Member Companies
- **Interaction with Government on Policy Issues**
- **Network Offices in India & Abroad**
- **Centre's of Excellence**
  - CII – Institute of Quality
  - CII – Total Cost Management
  - CII – Institute of Logistics
  - CII – ITC Centre for Sustainable Development
  - CII – Naoroji Godrej Centre of Excellence
  - CII – AVANTHA Centre for Competitiveness for SME's
  - CII – Sohrabji Godrej Green Business Centre
  - CII-Suresh Neotia Centre of Excellence for Leadership
  - CII-Triveni Water Institute

CII – Sohrabji Godrej Green Business Centre, Hyderabad

A unique Public – Private Partnership

(CII, Govt of Andhra Pradesh, USAID and Pirojsha Godrej Foundation)

Centre of "Excellence" for Energy, Environment, Green Buildings, Renewable energy, Water & Climate change activities in India

Focus areas of CII-Godrej GBC

Green Buildings

Technology Centre

New Ventures

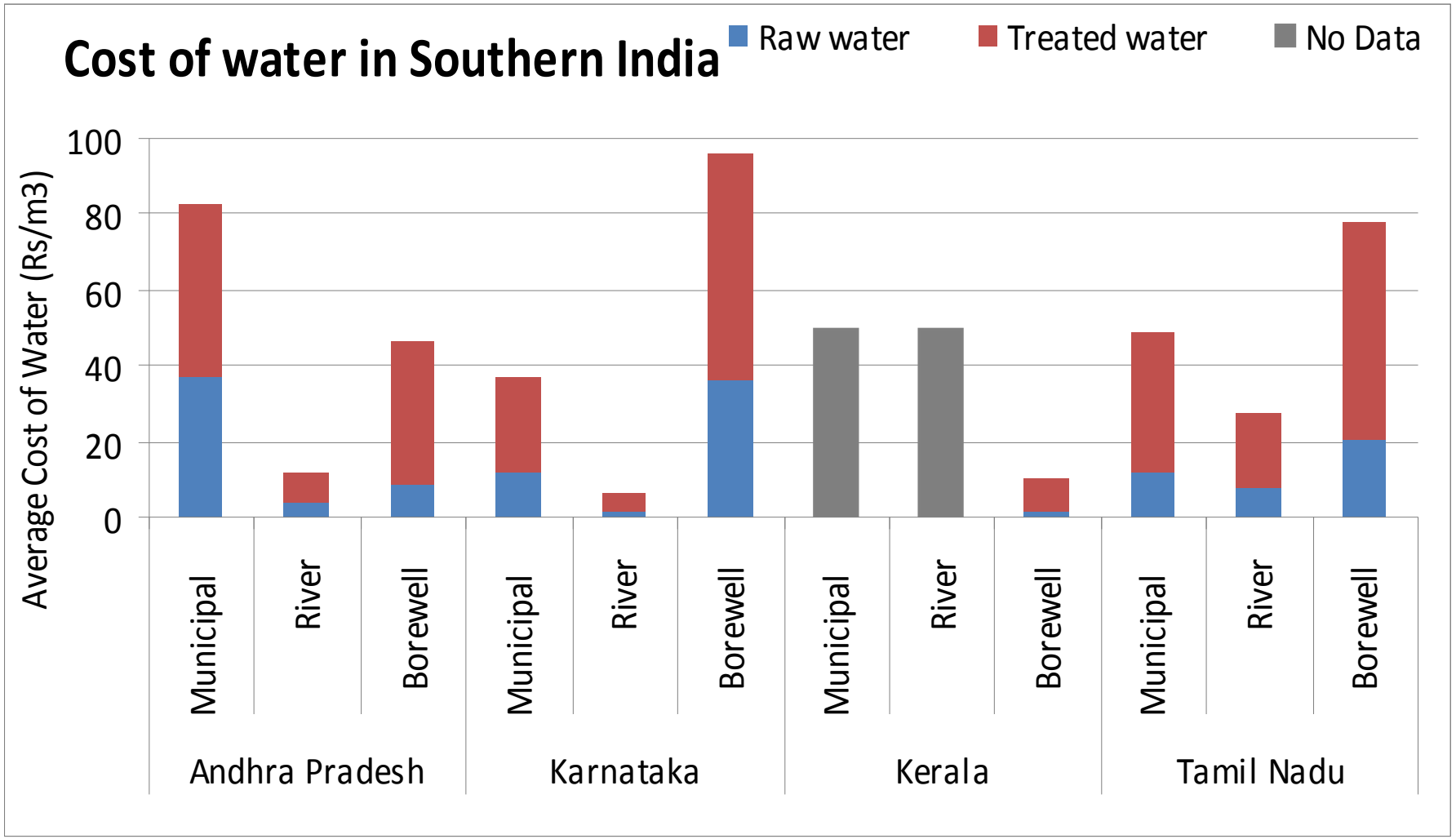
Environment & Recycling

Water Management

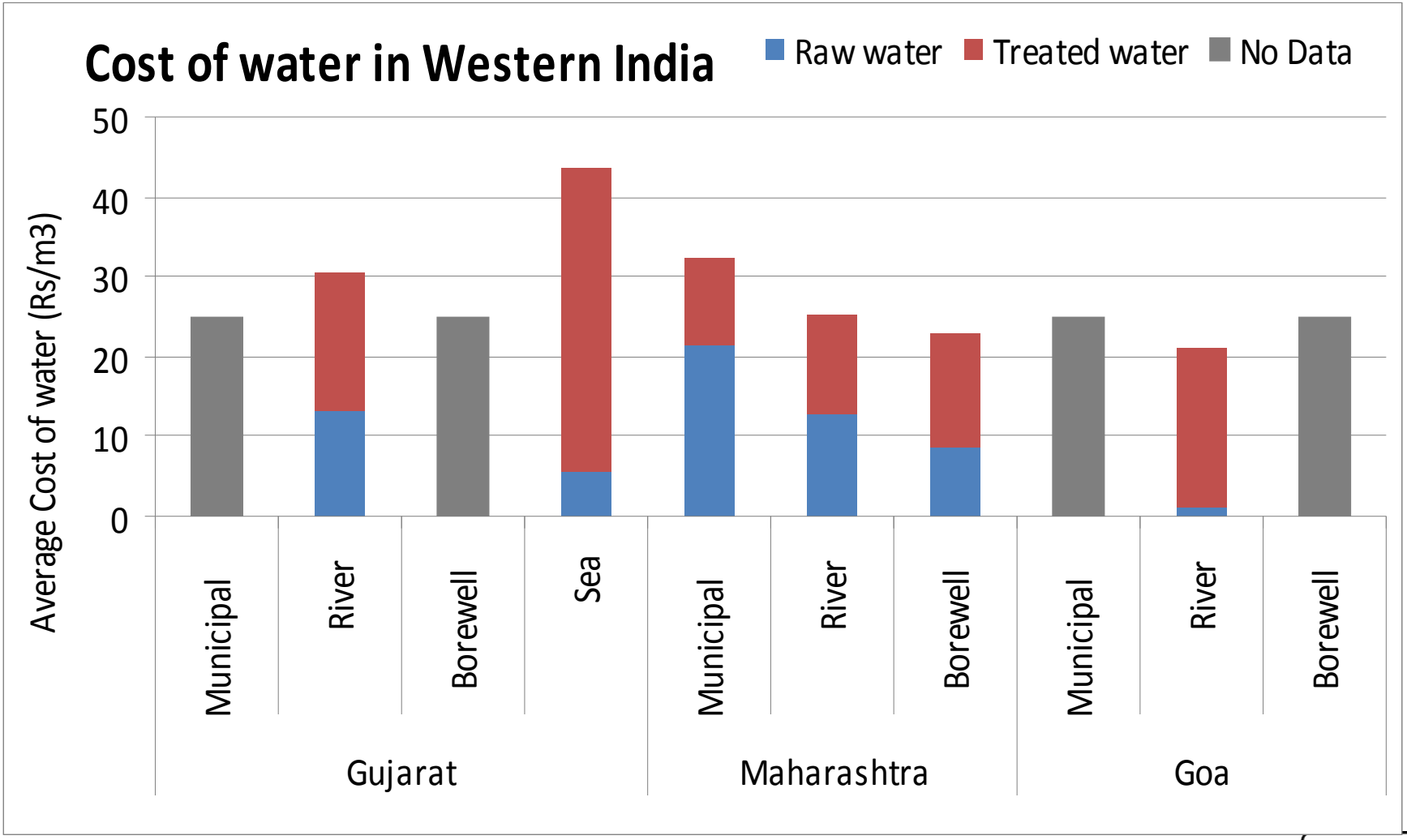
Renewable Energy

World Class Energy Efficiency

Cost of Water region wise



Cost of Water region wise..



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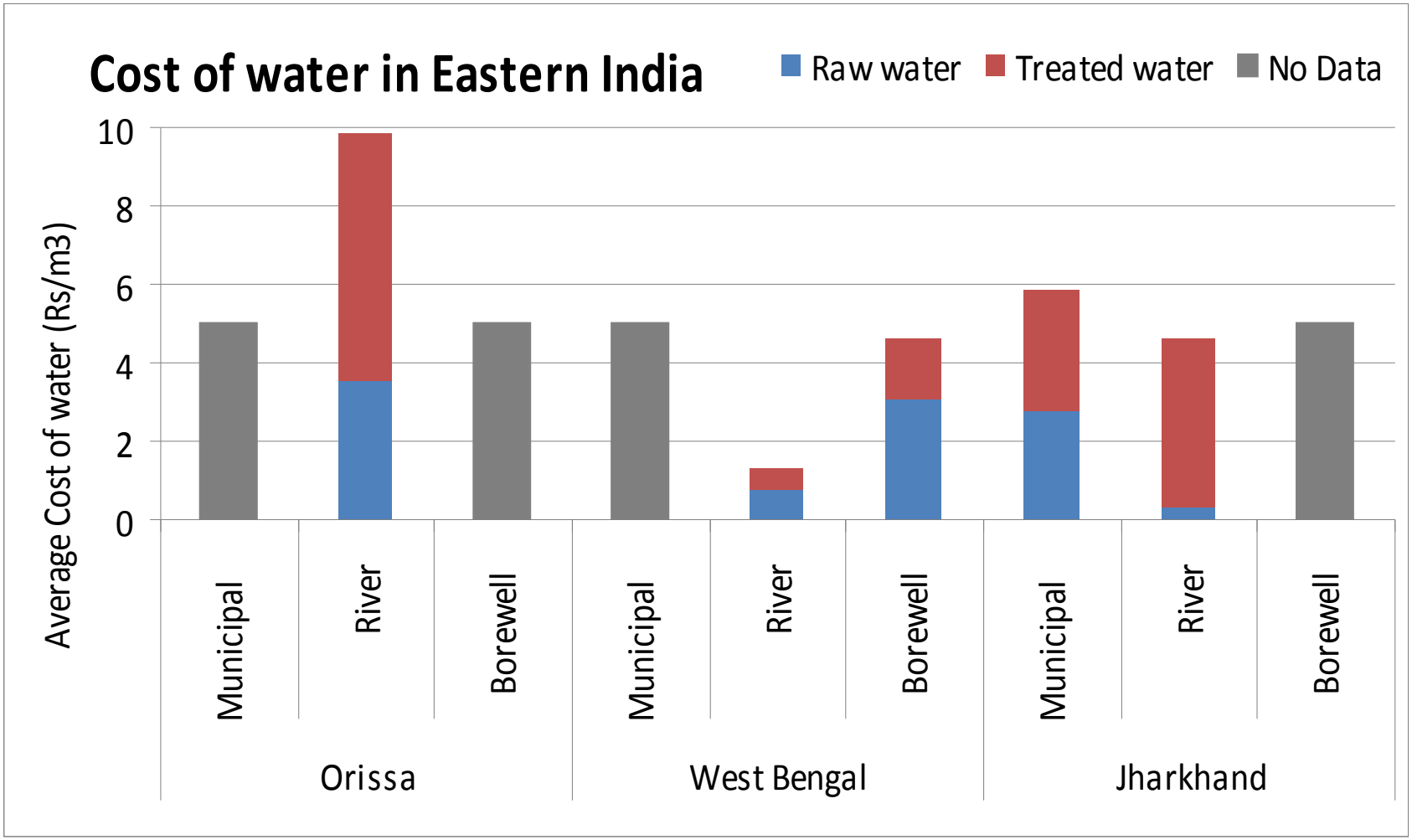
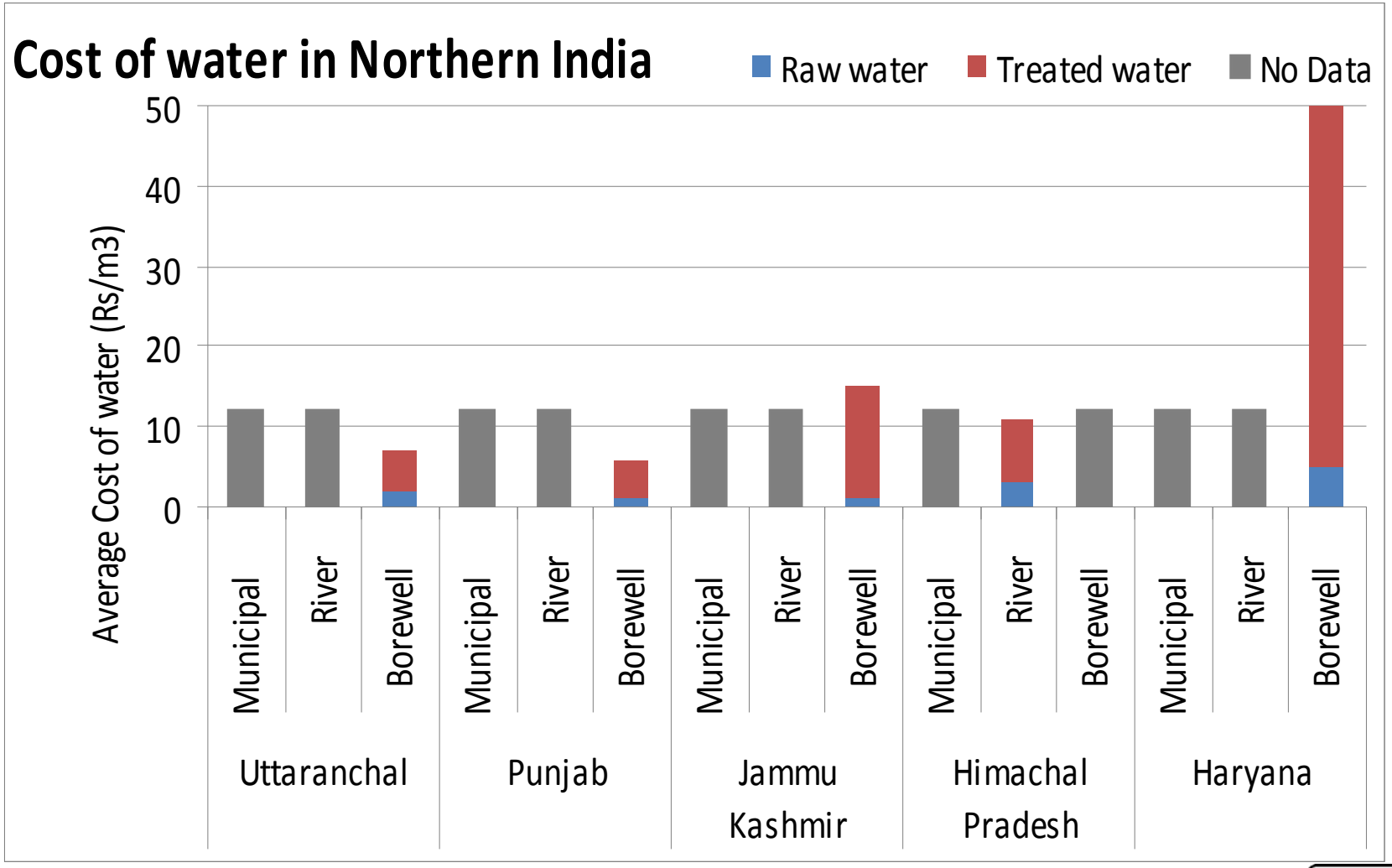


Cost of Water region wise..



Gist of water awards

Geographical spread of Questionnaires – Regions

	2009	2010	2011	%
South	24	35	37	39
West	30	19	14	15
North	18	23	32	34
East	5	6	12	12
Total	76	83	95	100%

Questionnaires - Sector wise

Sector	Nos
Automobile	9
Buildings	8
Cement	8
Chemical & Fertilizers	11
Engineering	7
Beverages	8
Non-ferrous	4

Sector	Nos
Pharma	2
Paper	16
Power plant	7
Steel	5
Printing & packaging	2
Tobacco	2
Others (sugar, tyre, glass, Textile & Pens)	6
Total	95

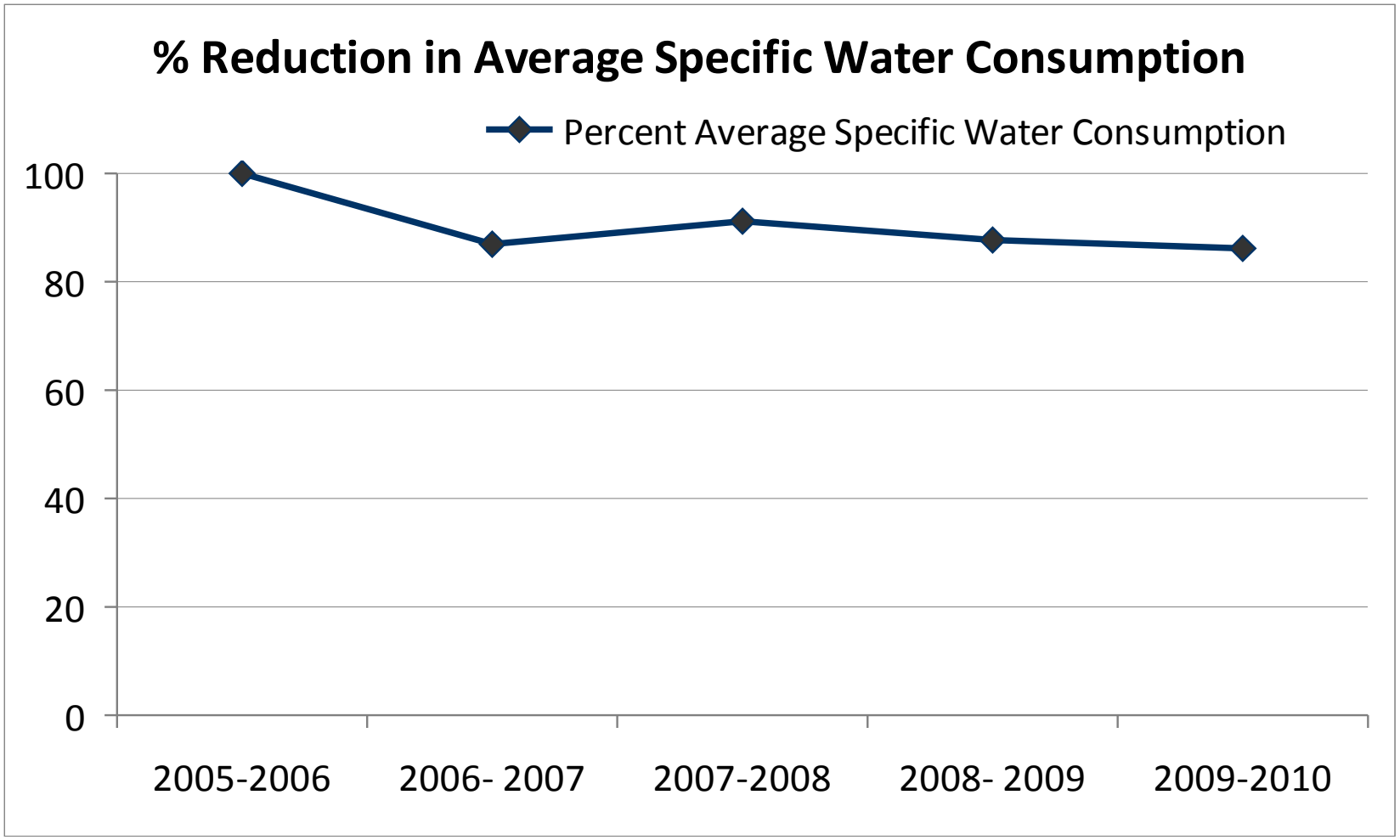
Water Consumption trends in Indian industry

- **Data of 95 industries which participated in CII National Water awards analysed for last 5 years**
  - **12 sectors – Power, Pulp & Paper, Engg, Petrochemical, Automobile, Iron & Steel, Non-ferrous metals, Beverages, Chemical, Pharma, Fertilizer, Cement**
- **Significant reduction in specific water consumption**
- **Significant increase in waste water recycled**

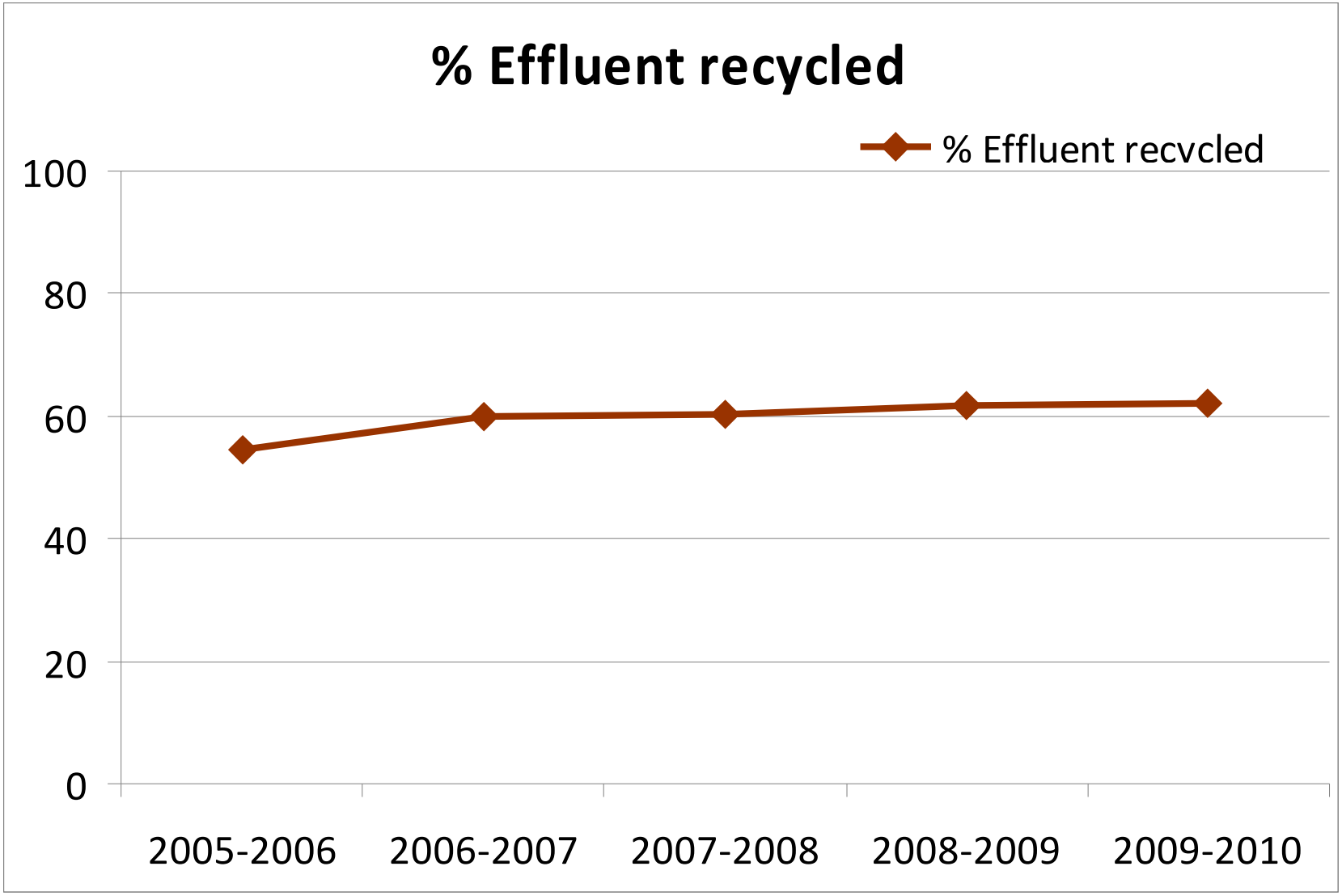
Water Consumption trends in Indian industry…

- **Reduction in Specific water consumption - 14 % in last 5 years**
- **Reduction in effluent discharge**
  - **Presently - 65 % of effluent recycled**
  - **11 % increase in last 5 years**

14% Reduction in Specific Water Consumption – 5 years

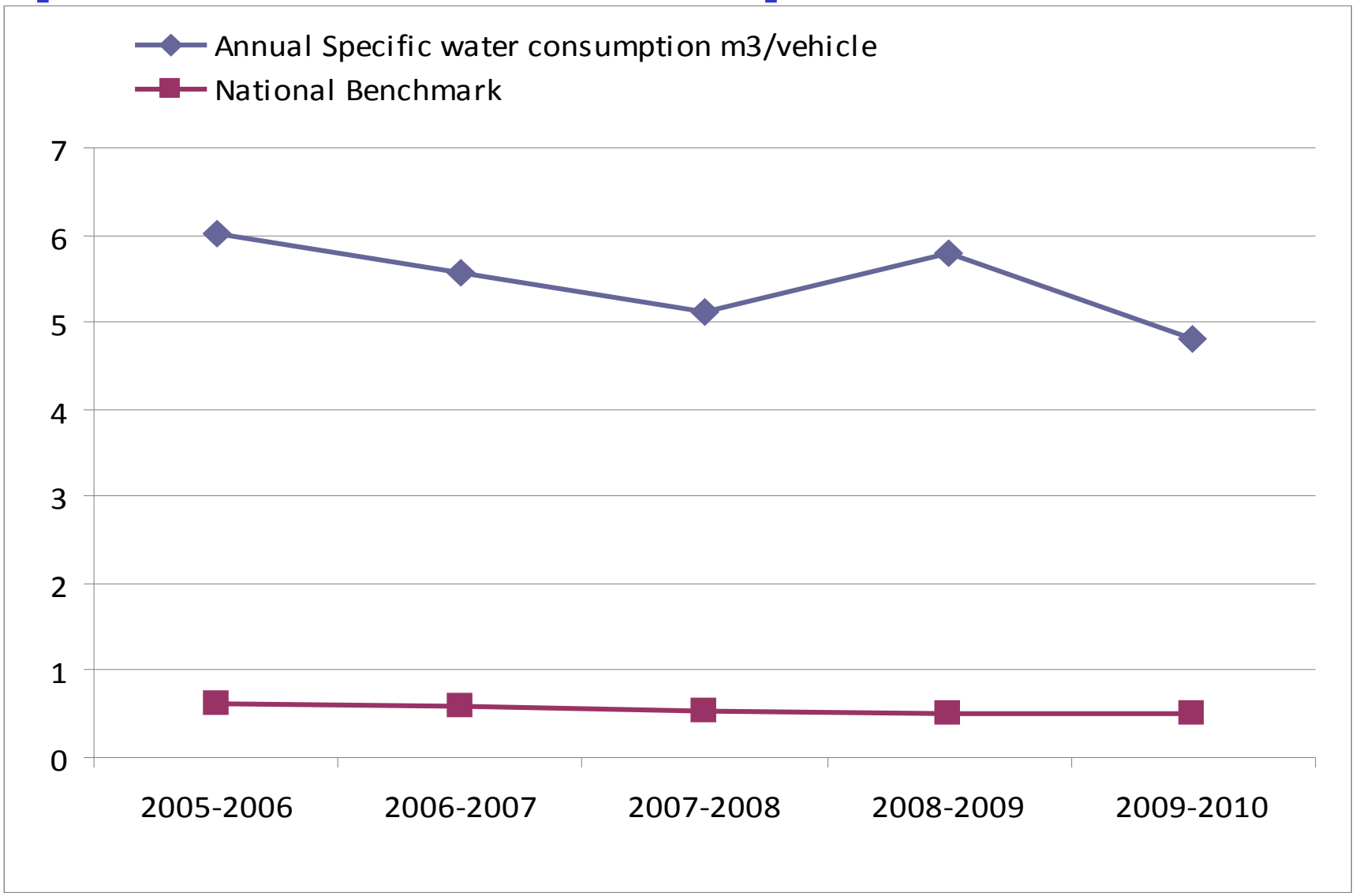


%Effluent Recycled increased from 45 to 65 % in 5 years

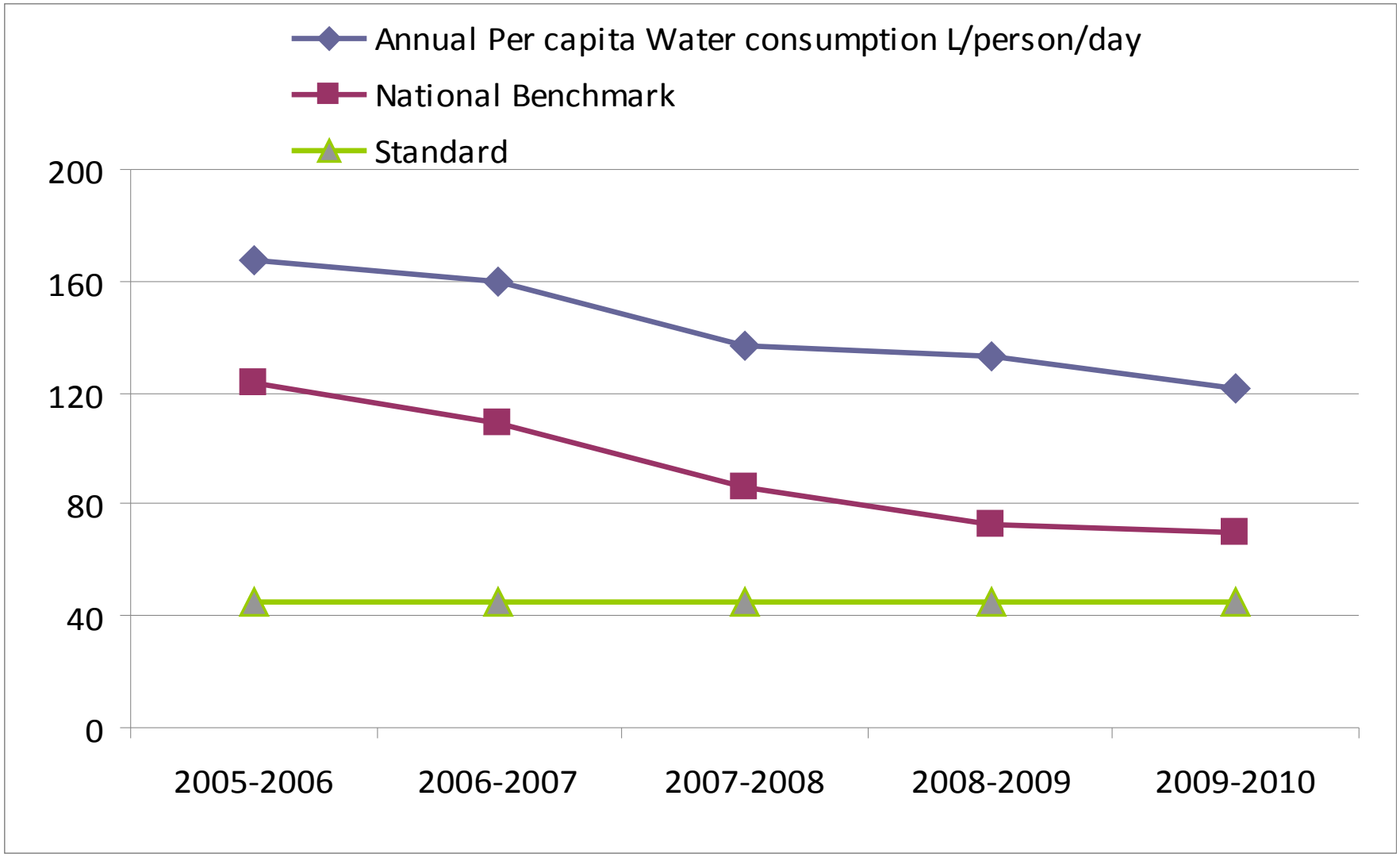


Analysis of sector wise / year wise achievement

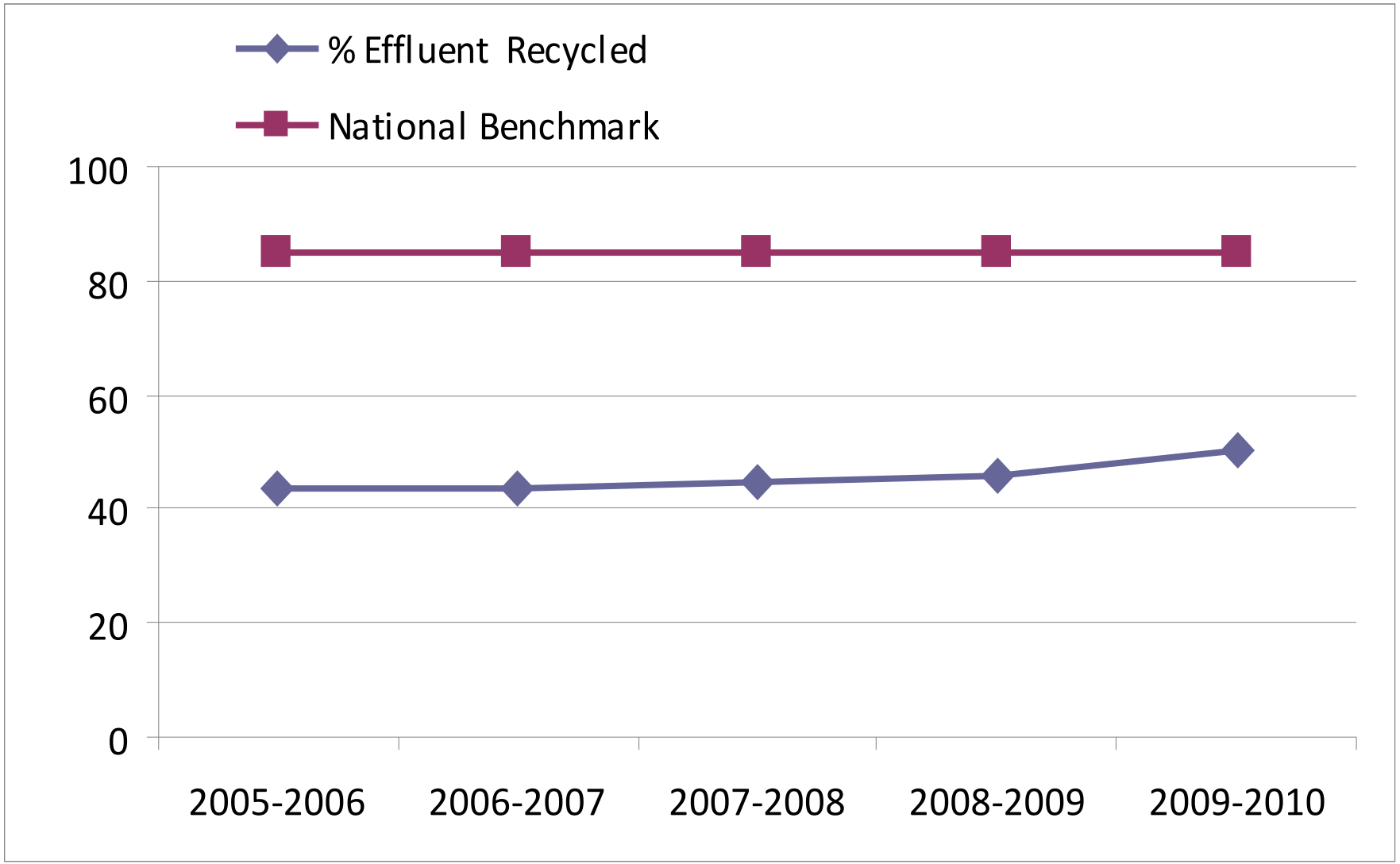
Specific Water consumption-Automobile



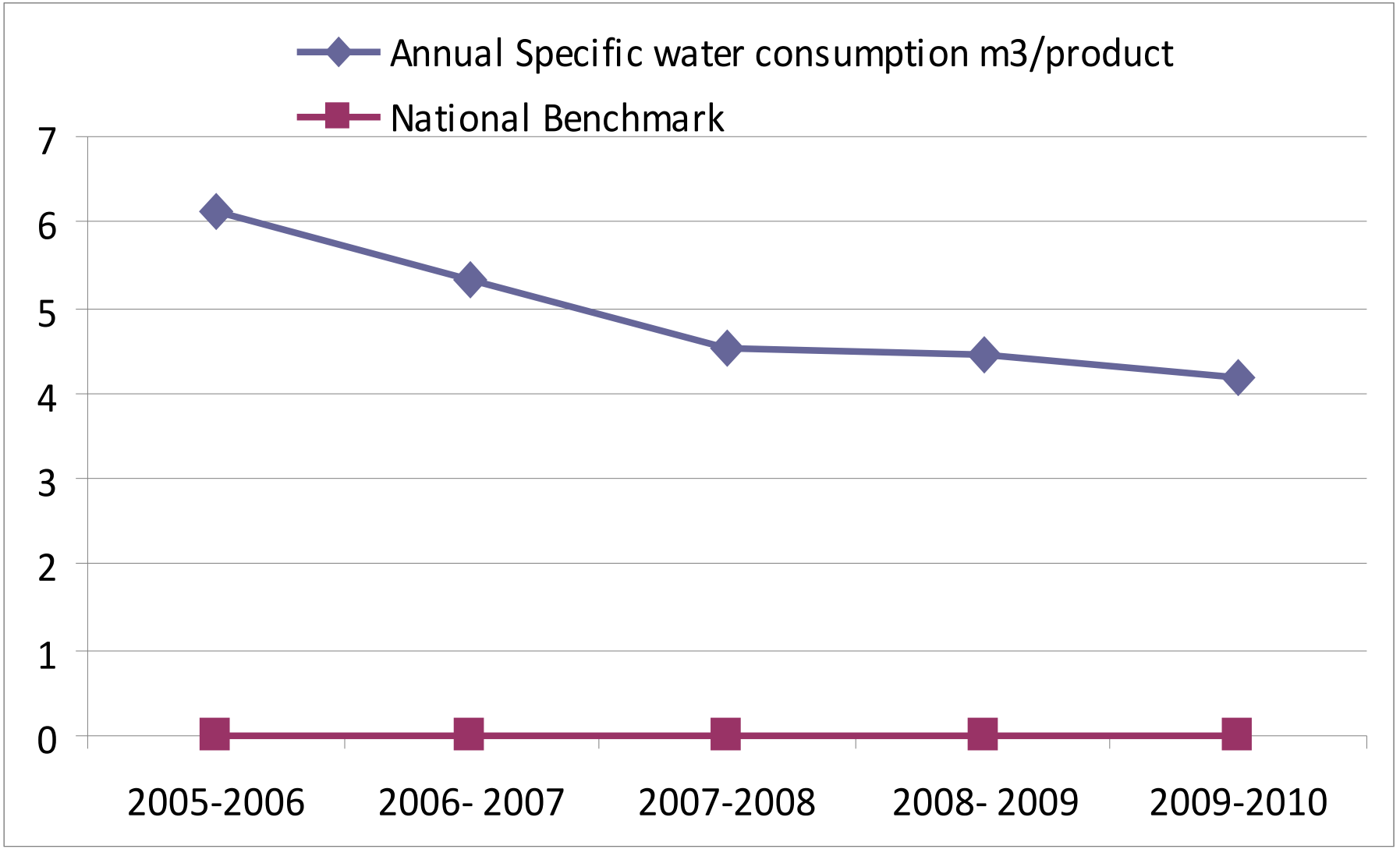
Per capita Water consumption- Automobile



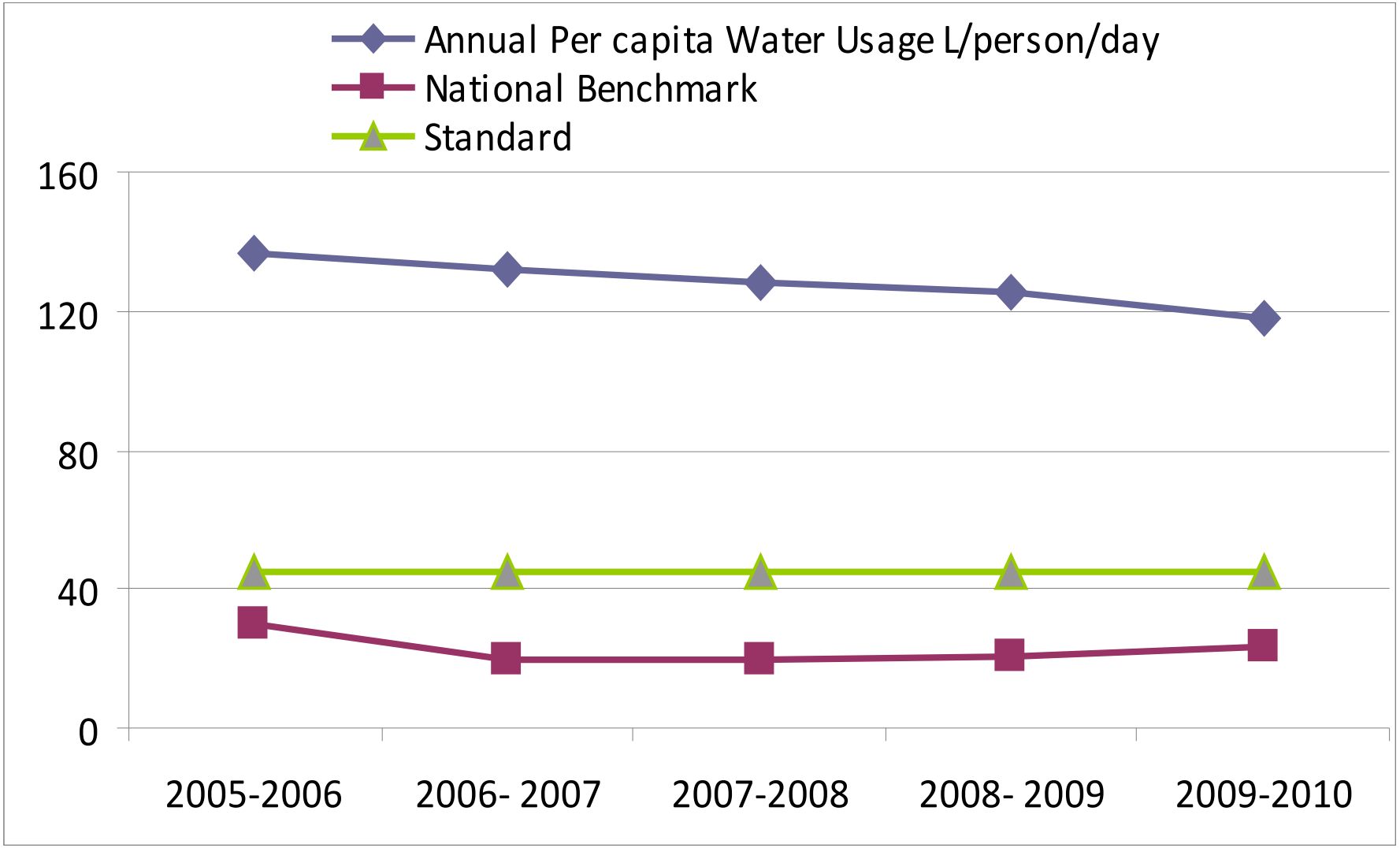
Percentage Effluent recycled- Automobile



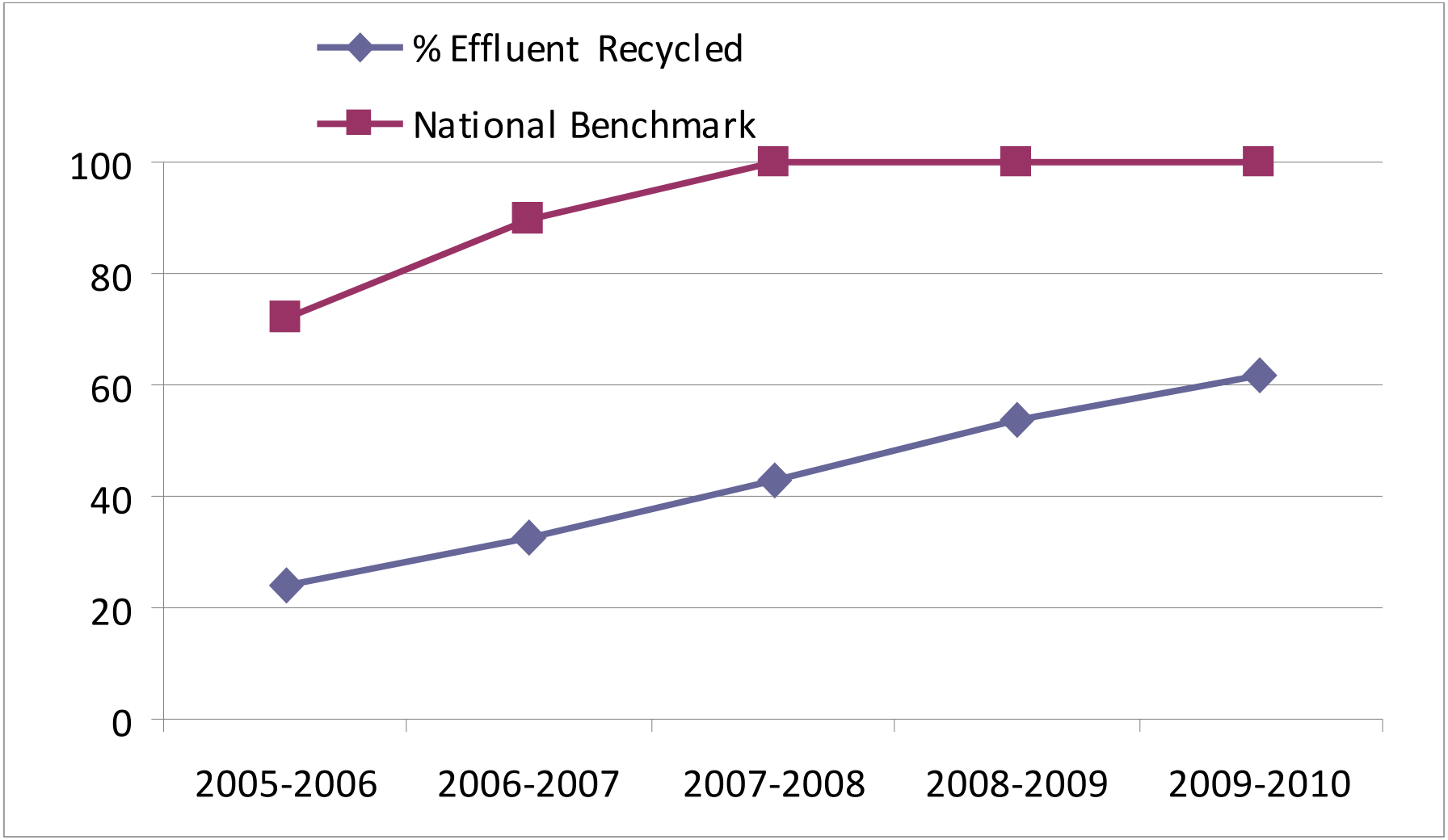
Specific Water consumption- Chemical



Per capita consumption- Chemical



Percentage Effluent recycled-Chemical



Sectorwise water cost as percentage cost of manufacturing

S.No	Sector	Water cost as percentage cost of manufacturing
01	Cement	0.775
02	Beverages	0.19
03	Automobile	0.26
04	Pulp and paper	0.57
05	Power	0.278
06	Engineering	0.15
07	Chemicals & fertilizers	0.37
08	Non-ferrous	1.33

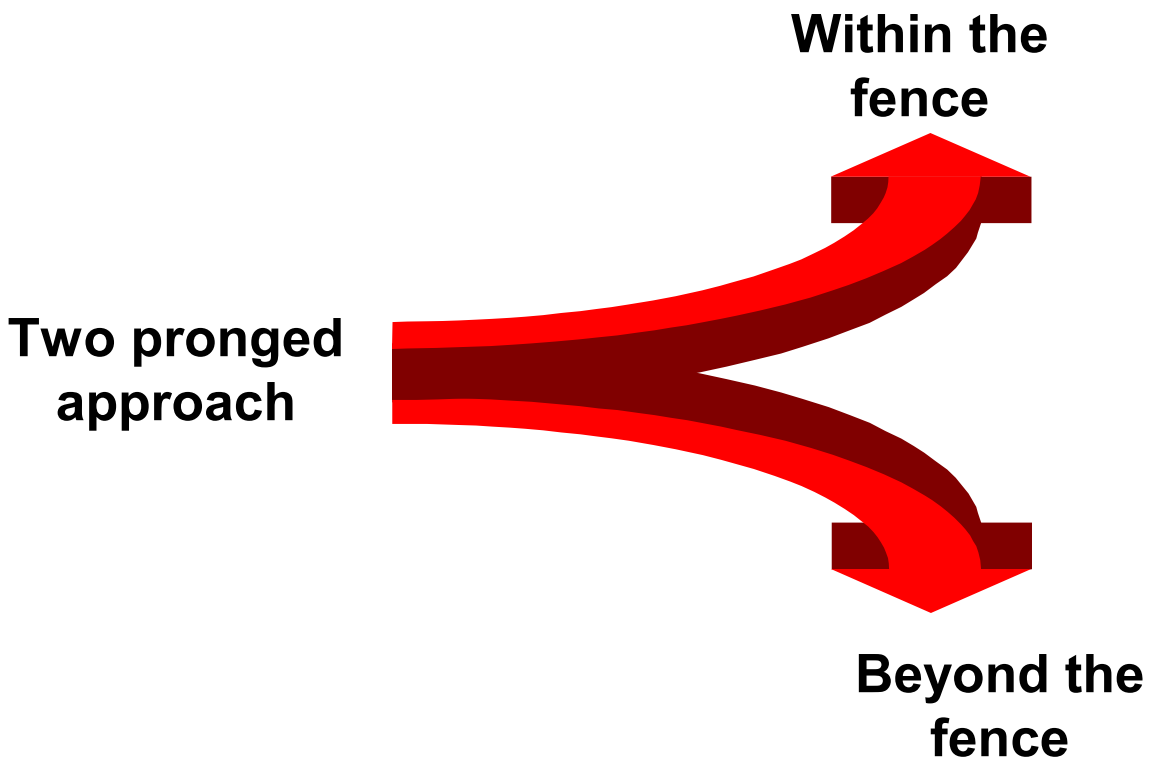
Important gains

- **7 years of water awards competition**
  - **Tangible benefits**
    - Rapid reduction in specific water consumption
    - Saving of fresh water
    - Low cost of productivity
    - Reduction in effluent generation and associated energy saving
    - Reduction in chemical consumption for treatment
  - **Intangible benefits**
    - Mutual benefits to all stakeholders
    - Opportunity to create livelihood
    - Significantly increase value chain and product eco-efficiency
    - Enhanced Corporate image

Internal competition- beating the best

- **Healthy internal competition**
  - In reducing the specific water consumption
  - Among various units of the same group
    - Eg. Mahindra & Mahindra- Automobile sector
    - Trend from 2005-2010
      - ✔ Mahindra, Zaheerabad-3.5 to 2.7 m3/ton
      - ✔ Mahindra, Mumbai- 3.83 to 3 m3/ton
      - ✔ Mahindra, Nashik- 6.24 to 5 m3/ton

Approach to water management

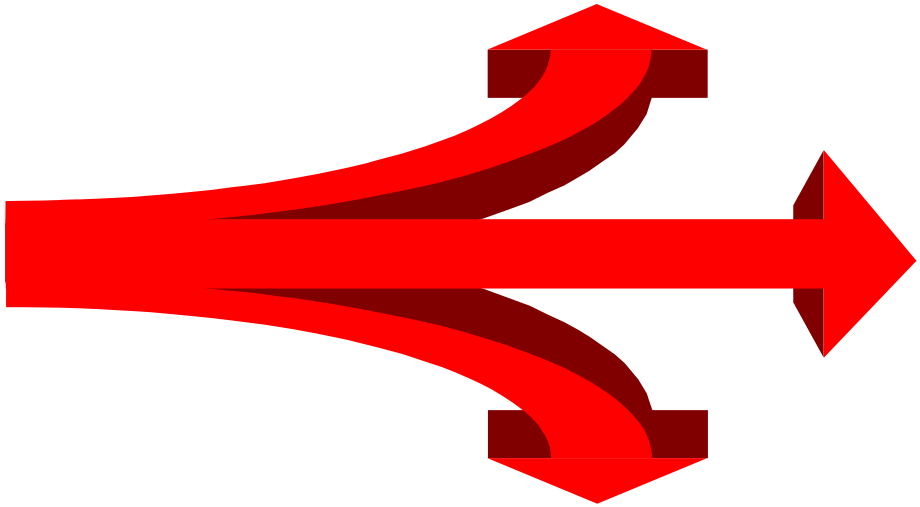


Approach to water management -Within the fence

Approach to Water management-Within the fence

Augmentation of water resources & storage

3 pronged approach



Reduce, Reuse & Recycle (Zero Water Discharge) in Industries / buildings

Reuse of treated municipal waste water in industries

Approach to water management -Beyond the fence

What are implications for Business ?

- **Water – not under direct sphere of corporate control**
- **But can affect companies in different ways**
  - **External changes can result in steep increase in water costs**
  - **Production delays**
  - **Limits on production**
  - **strong community opposition to company activities**

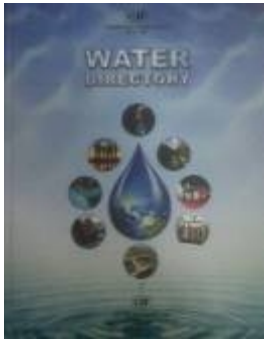
How is water management beyond the fence useful ?

- **Benefits**
  - **Identification of partnerships with local communities, water authorities, NGO's and other organizations**
  - **Water related projects that could support local communities**
    - **By improving water quality for drinking and sanitation**
    - **For use in agriculture**
    - **In local industry or recreation**

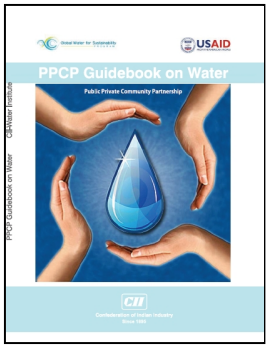
Strategies

- **What can Businesses do ?**
  - **Innovating to significantly increase value chain and product eco-efficiency**
  - **Investing in the restoration of ecological systems that affect water flow**
  - **Engaging in collaborative strategies for maintaining water resources over time**

Major highlights- Publications



Water Directory



Guidebook on PPCP

Our Cup of Joy- India's Best practices in water

Water quality & Standards- Essentials

Going forward further improvement

Thrust on associate involvement

- **Vendor / associate involvement in conserving water**
  - **Awareness creation programs**
  - **Internal competitions / awards**
  - **Preferred rankings**

Targeting anti-pollution drives

- **Recycling of wastewater**
  - Treatment of wastewater generated within unit (or)
  - Reusing wastewater received from municipality or any other source (or)
  - Giving excess wastewater to community for low end application
  - Handling of the wastewater (reject of RO) with Solar evaporation/ Multi-effect evaporation/ TSDFS
    - Treatment of high concentrated salts/solids (or)
    - Waste oil/coolant management system

Best practices in Water management

Case study-1
Zero water discharge Industry

Zero liquid discharge in petroleum refinery

- Varying effluent characteristics
- Segregation of effluent streams
- Installed RO & UF combination for treating waste water
- 1.4 million m^3 /year of fresh water saved
- 14.6 million m^3 / year could be saved in 18 refineries across the country
- 100% zero liquid discharge

Zero liquid discharge set up at CPCL refinery Chennai

Case study-2

Reuse of treated municipal waste water in industry, ITC-Bengaluru

Reuse of treated municipal waste water in industry

- Towards conservation of fresh ground water
- Reuse of 200 m^3 /day of secondary treated waste water
  - Installed full fledged tertiary treated water system using submerged UF-RO membrane
  - Utilized for non-potable purposes
- Fresh water saving of 73000m^3 /year

Case study-3

Reduce fresh water consumption in the metal treatment section Thyssenkrupp Electrical Steel Pvt.Ltd., Nashik, Maharashtra

Reduce fresh water consumption in the metal treatment section

- Saving of 65,000 m3/year of fresh water consumption
- Cost savings of Rs. 2,50,000/year
- Alkaline wastewater treated
  - Neutralisation, addition of settling agent, clariflocculation & passing through a sand and carbon filter and softener

Case study-4

Reuse of rinse water for glass bottle washing Pepsico India Ltd.

Reuse of Rinse Water for Glass Bottle Washing

- 0.2 million m3/year of water savings
- 0.6 million/year of cost savings
- 60 - 70% rinse water collected and sent to recovery plant
- Fresh water make up reduced to 65 m3/day
- Investment: Rs. 0.2 million for online UV treatment
- Payback period: 4 months

Rinse water treated using weak acid cation combined with activated carbon filter sand filter, polishing unit and online UV and reused

Case study-5

Roof top rain water harvesting

Industry-Saint Gobain Glass, Chennai

Roof top rain water harvesting in industry

- Average rainfall 1200 mm per year - Chennai
- Water harvested 150,000m³/year
- Fresh water cost saving of Rs. 5 million/ year
- Annual Recharge to Ground Water through Rainwater Harvesting
  - More than Annual Withdrawal of Ground Water
  - Water Table in the Open Wells has been maintained

Saint Gobain Glass, Chennai

Case study-6

Effective management of land and water for improving water availability

Hindalco Industries Ltd, Renukoot

Effective management of land and water for improving water availability

- **Objective: To increase the water availability in the selected 25 villages through proper utilization of land & water**
- **Results:**
  - **749 Ha of waste land has been made productive through social forestry**
  - **810 acre of land irrigated through 27 lift irrigation units**
  - **Adequate food availability for all 12 months**
  - **Additional income generated for 800 farmers -**
    - **Rs 2.32 crores / year (@ Rs 29,000 per farmer / year)**

Lift irrigation channel & wells

Effective management of land and water for improving water availability..

- **How achieved**
  - Awareness programs to community on rain water conservation, better agriculture practices
  - Agriculture expert interaction with farmers for selection of crops
  - Construction of water channels, irrigation wells rainwater harvesting structures and ponds
  - Development of water committees for maintaining resources and equipment
  - User charges : Rs 15-20 per hour
  - Total investment : Rs 68 lakhs

Effective management of land and water for improving water availability..

- **Potential for replication**
  - **About 65 million hectares of land exists as wasteland in India, where better irrigation practices & social forestry can be adopted.**
  - **Potential in Sonbhadra district, UP**
    - **Wasteland development – 16432 hectares**
    - **Additional Income generation (estimate) – Rs 35 crores / year**

Thank You