

GE Power & Water
Water & Process Technologies

Conference on Urban Water Management

Confederation of Indian Industry

12 March 2014, Bangalore



imagination at work

Agenda

- Urban Wastewater Scenario
- Treatment & Reuse challenges
- Role of Technology
- Enabling reuse
- Summary

The Urban Water & Wastewater Problem

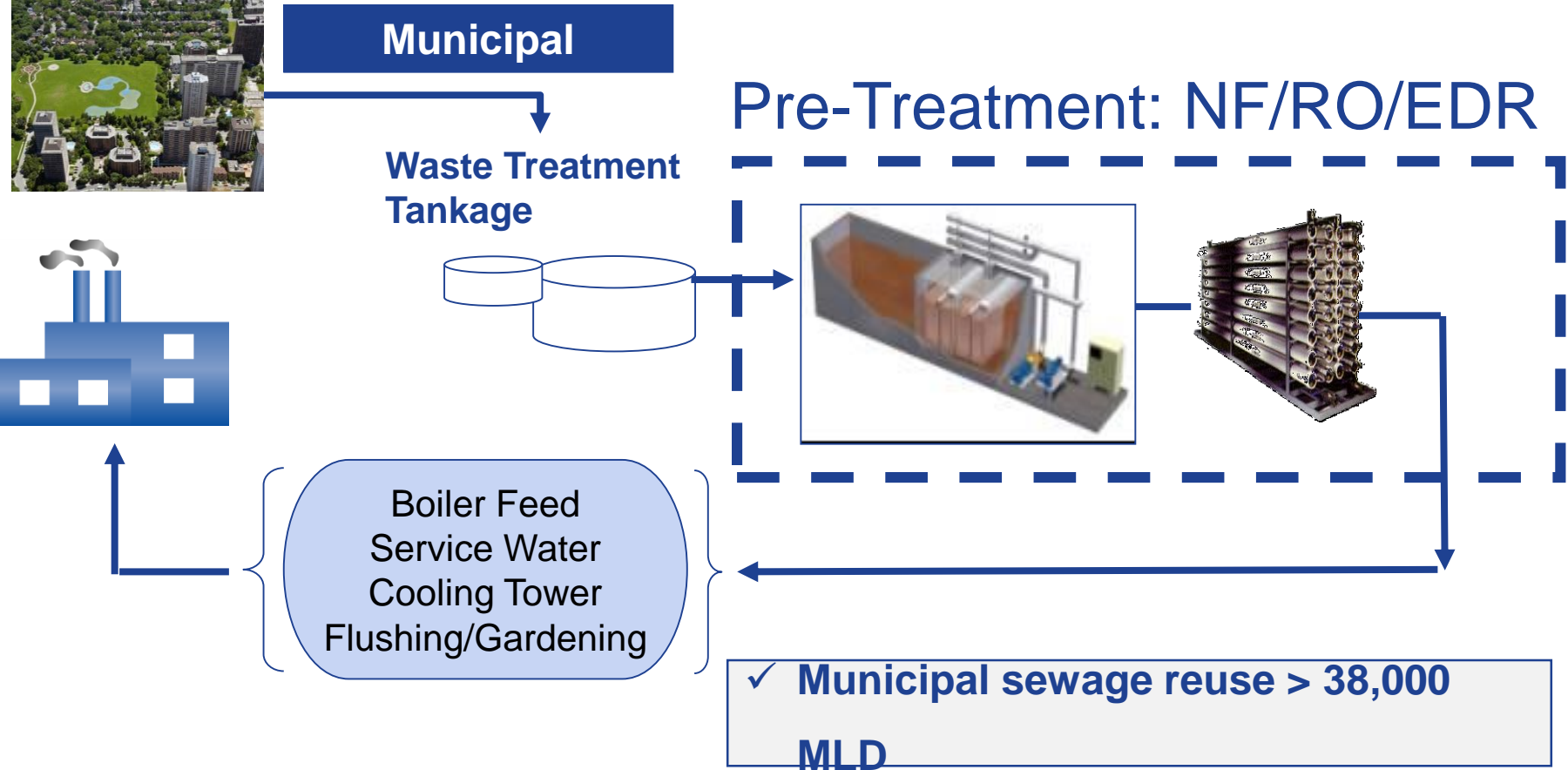
- Rapid growth of Urban agglomerations in peripheral areas
- Deteriorating quality of urban water sources with respect to hardness, nitrates, fluoride & organics
- Reliance on expensive (~INR 100/KL in Bangalore) and unsafe sources like Tankers & contaminated groundwater



> 250 MLD of sewage being added every year *just from large buildings*

in Top 8 Urban Centers

Municipal Wastewater Reuse Concept (Large Scale)



Case Study: Pragati Power Station Delhi

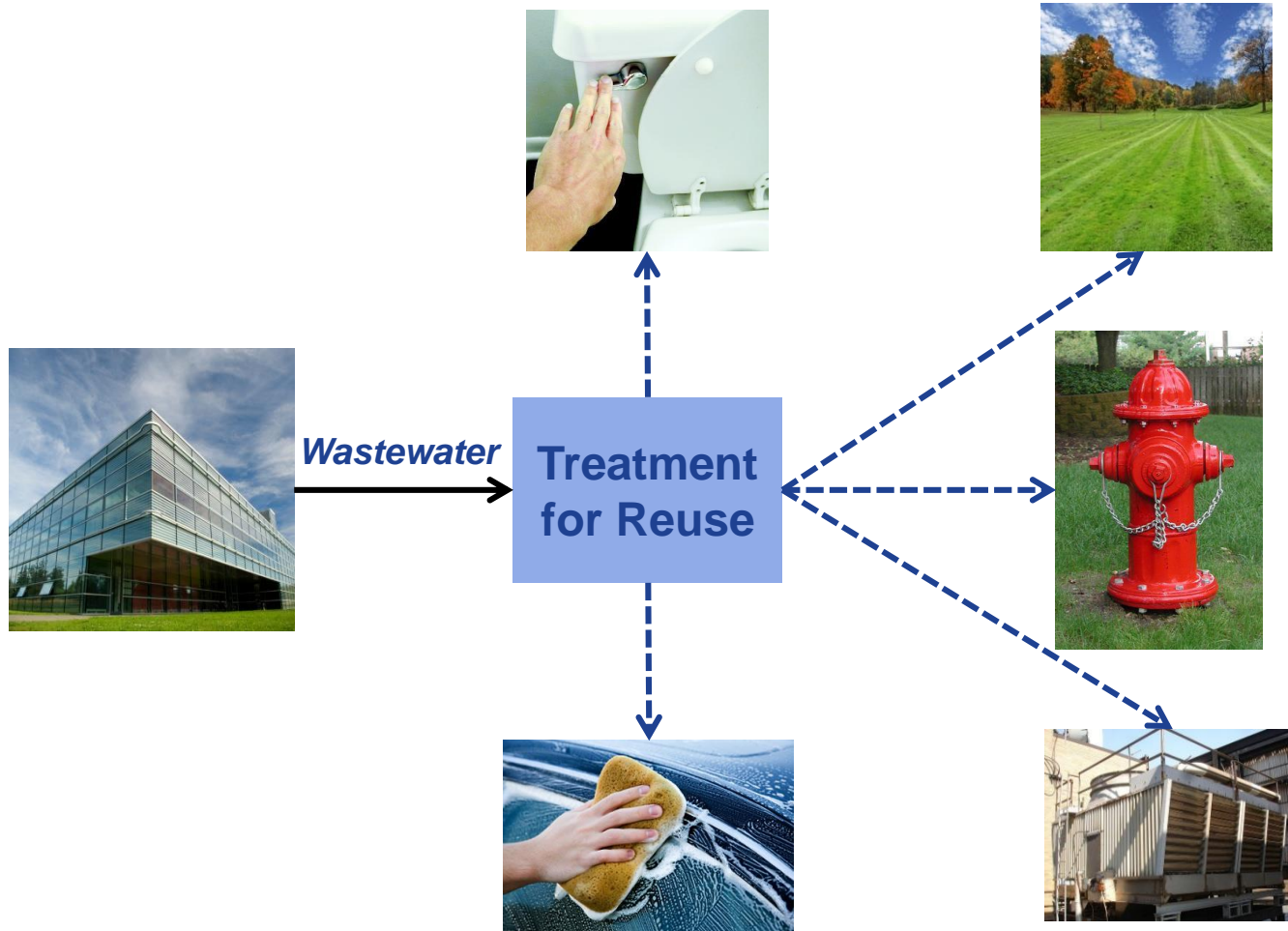
Pragati Power Corporation Limited

Customer Challenge	Lack of freshwater supply from Delhi Govt.
Application	Reuse of secondary treated sewage for boiler feed
Industry	Power
Capacity	1.2 MLD
Location	New Delhi, India
Year of Commissioning	2012
System	Tertiary MBR
Membranes	ZW 500 D Hollow fiber Outside- in, BWRO
Partner	BHEL



Parameter	Influent	Effluent (Post T-MBR)
BOD	80	<5
COD	100- 120	< 20
TSS	20 – 25	< 5
SDI		<3

Wastewater Reuse Concept (Small Scale)



1. Environmental sustainability
2. Economic efficiency
3. Long-term resource security

Challenges in Reuse

Large Scale

1. Pipeline network
2. Financial viability & project structuring
3. Offtake agreements
/ Risk mitigation

Small Scale

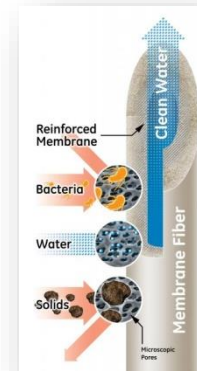
1. Lack of awareness
2. Negative perception
3. Plant operations
4. Quality monitoring & regulation

Technology is not a challenge!

Bigger challenges in planning & implementation

Wastewater Reuse – Technology Perspective (MBR)

- 1 **Smaller footprint:** 1/3 – 1/5 of conventional plants
- 2 **Ability to retrofit:** Minimize civil works in upgrade of existing systems
- 3 **Modular designs:** Flexibility to expand
- 4 **Absolute membrane barrier:** Consistently high effluent quality
- 5 **Automatic operations:** Lower overheads for non-industrial Customers



Four pillars to enable more Reuse

1. Education and Outreach

- Recognition awards and certification programs
- Reporting of water consumption, discharge, and reuse data

2. Removing Barriers

- Revising plumbing codes to allow dual piping
- Alleviating stringent permitting and inspection requirements for reuse

3. Incentives

- Direct subsidies
- Reductions in payments to the Government

4. Mandates and Regulation

- Requiring utilities to develop plans for recycled water
- Restricting potable water to human or food related uses



Summary

1. Reuse is not an option – It's an imperative
2. Role of technology is paramount for safety & reliability of treatment & reuse systems
3. Enable more reuse with:
 1. Education & outreach
 2. Removal of barriers
 3. Incentives
 4. Regulation



GE's MBR: Leading in decentralized Urban Wastewater Reuse

S.No.	Customer	Location	Flow Rate (KLD)
1	Infosys (2)	Pune, Mysore	2000, 3000
2	BWSSB	Bangalore	1500
3	IISc.	Bangalore	500
4	TCS (6)	Chennai, Bhubaneswar, Pune, Gandhinagar, Trivandrum, Kochi	600 - 2000
5	Oberoi Hotels	Mumbai, Udaipur	300
6	Ozone Group	Chennai	1000
8	Computer Associates	Hyderabad	100
9	Oberoi Realty (4)	Mumbai	155 – 700
10	Lodha Builders	Mumbai	3100, 6000
11	3C	NCR	1200
12	Vatika	NCR	350
13	Uppal	NCR	350





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