Minimization of Fresh Water Usage at Coal-Fired Power Plants

Non-traditional Sources of Process and Cooling Water

Technology to Facilitate the Use of Impaired Waters in Cooling Towers

3-year $2MM Program
DE-NT0005961

Donald Whisenhunt, GE Global Research
Jeff Melzer and Ashok Shetty, GE Water and Process Technologies

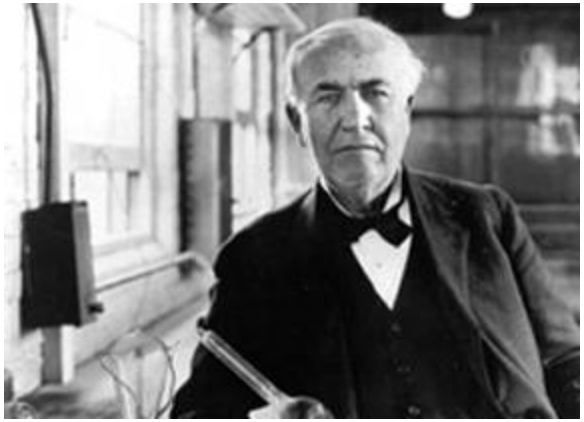
imagination at work

October 28, 2008

This is GE

imagination at work

GE … a heritage of innovation



Founded in 1892

$173 billion in annual revenues

Only company in Dow Jones index originally listed in 1896

330,000 employees worldwide

Four segments aligned for growth

Infrastructure - Technology

Infrastructure - Energy

GE Power and Water

GE Capital

NBC Universal

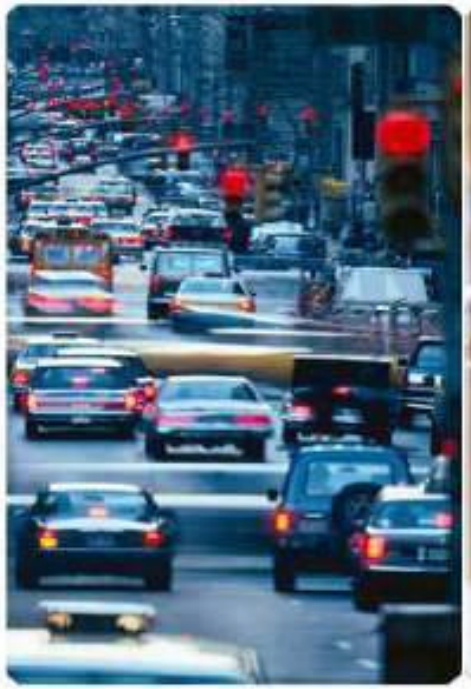
NBC BEIJING 2008

hulu

The world today…

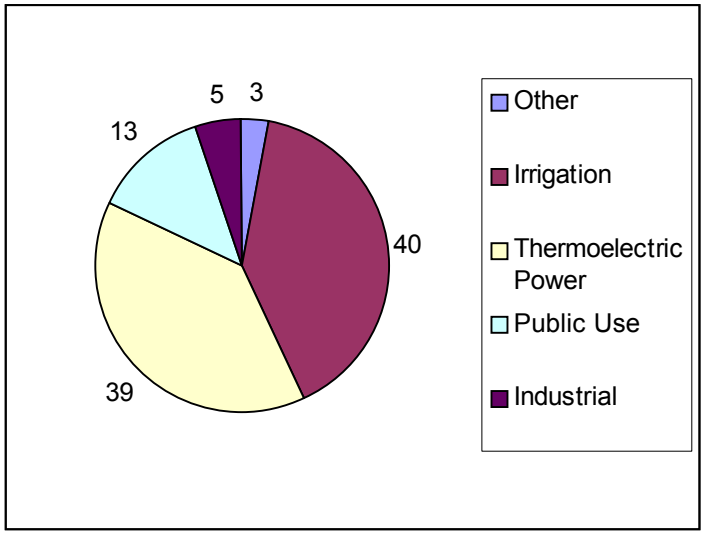
Global trends …

Population **Consumption** **Energy Security** **Environment**



… create big challenges

Fresh Water Minimization at Coal Fired Power Plants

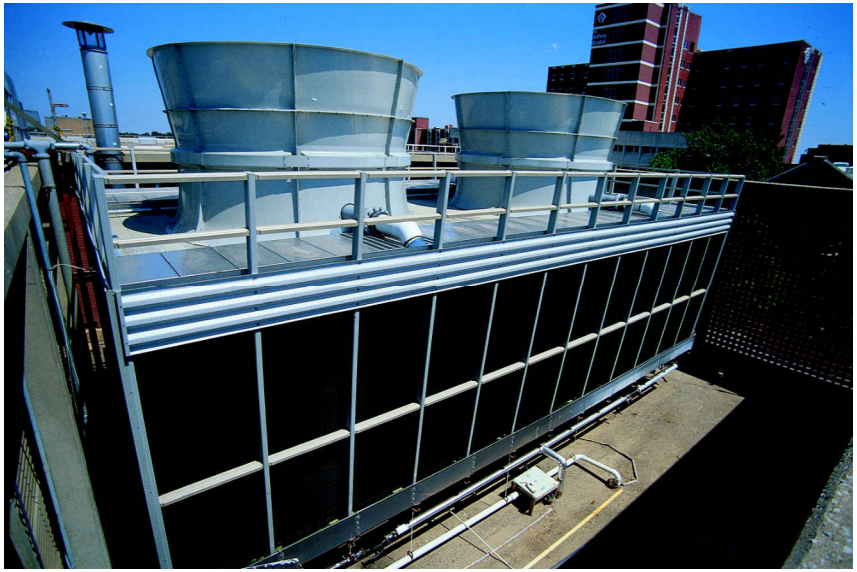


Per-day water use in The U.S. = 345 billion gal

From C&EN Oct 6, 2008

Short Term DOE Goal:

By 2015
50% Reduction
$3.90/kgal



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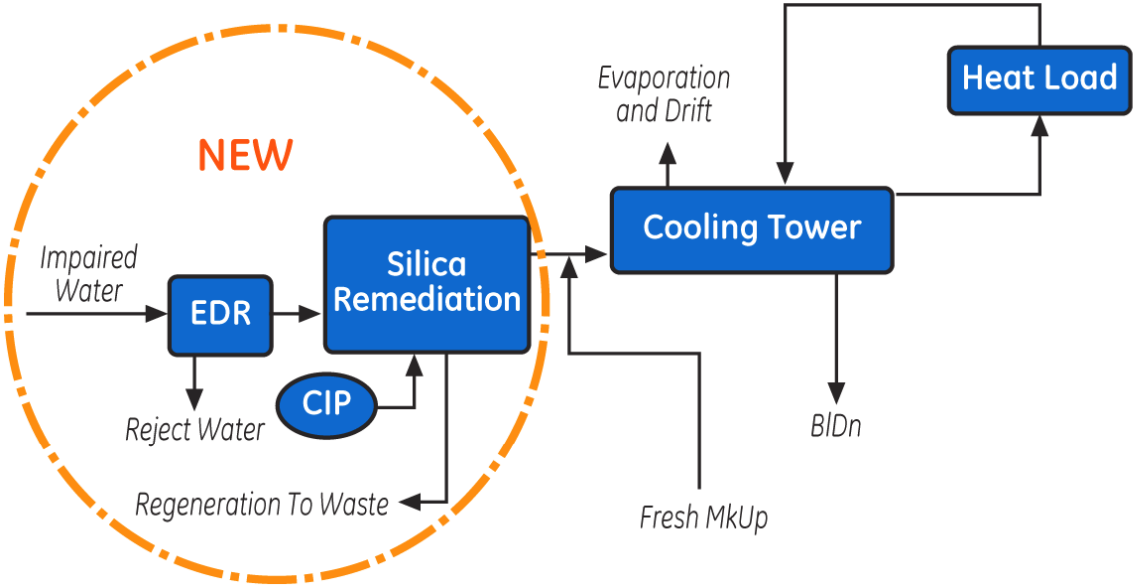
GE Approach



No Change Other Than Use of Impaired Water

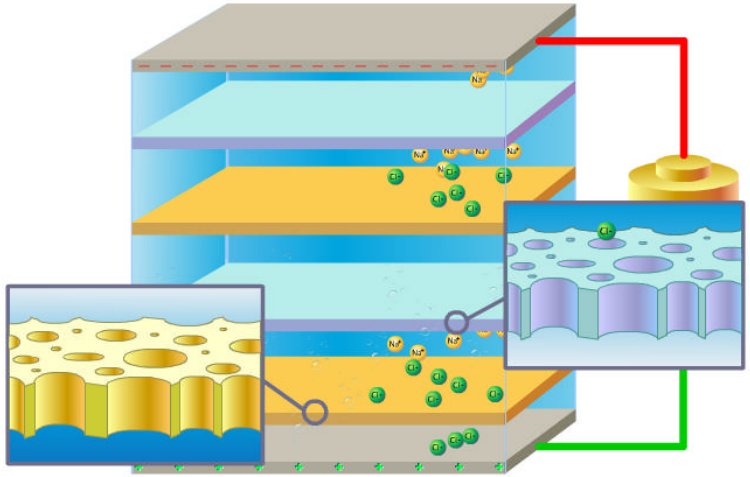
State	Fresh MkUp	BlDn	Impaired	EDR BlDn	Regen BlDn	Evaporation	% Savings of Fresh Water
Current	11,194	2,239	0	0	0	8,955	0
New	***5,547***	***2,239***	***6,101***	***-554***	***-?***	***8,955***	***50***

Recirculation Rate = 430,000 gpm Current Cycles = 5

Novel Silica Remediation Technology Coupled to EDR Solution

GE Approach

Impaired Water
2500 TDS
100 ppm Silica

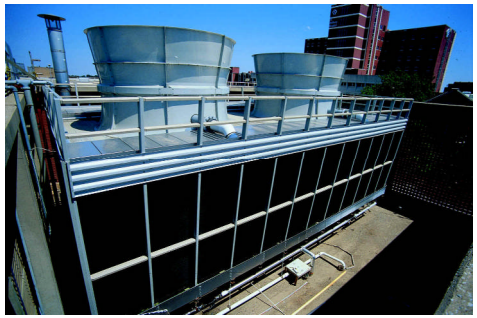


EDR – Self Cleaning
0.5 mg/L Chlorine tolerant

EDR Treated Water
25-100 TDS
100 ppm Silica

Silica Remediation

Treated Water
25-100 TDS
20 ppm Silica



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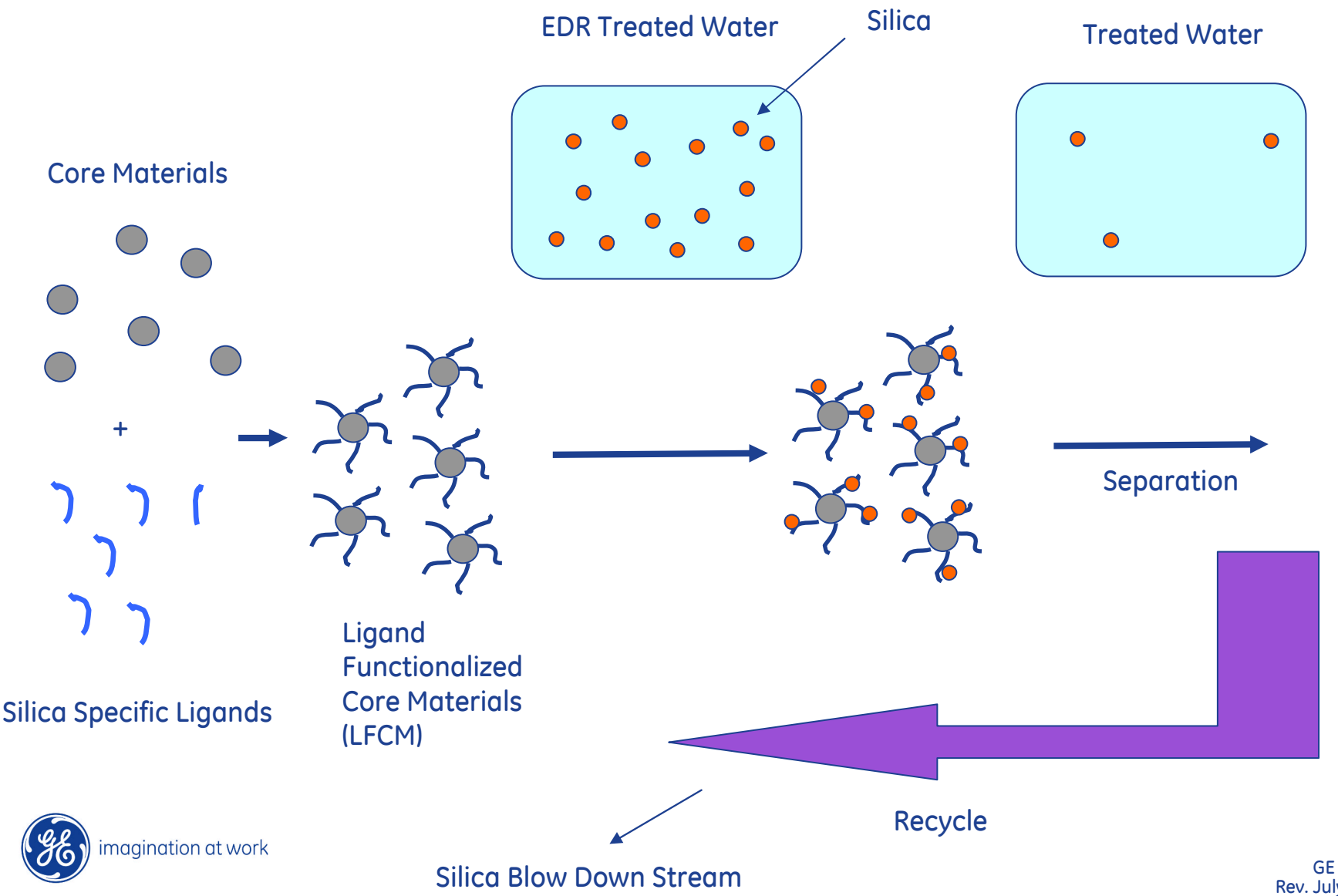
Silica Remediation Technology



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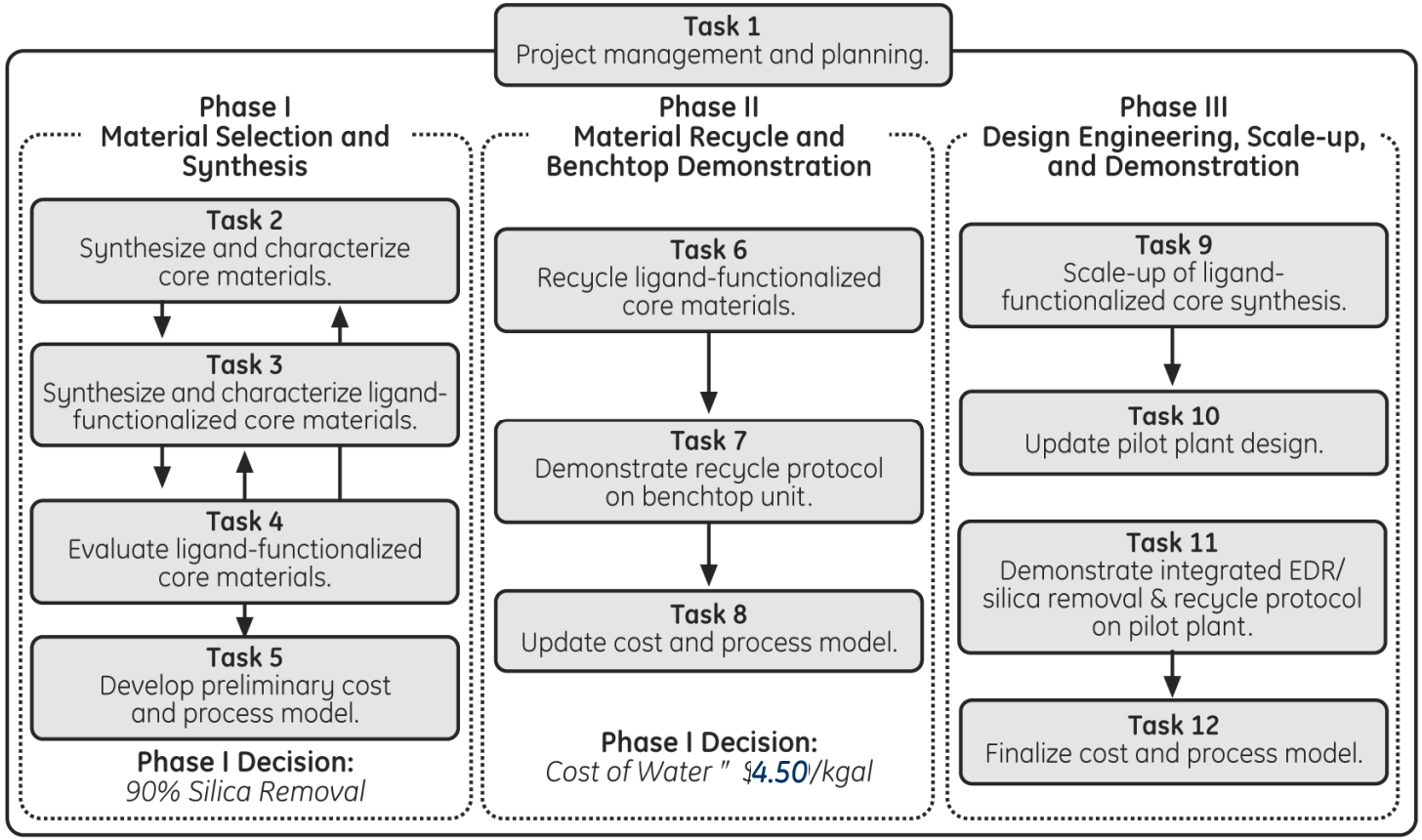
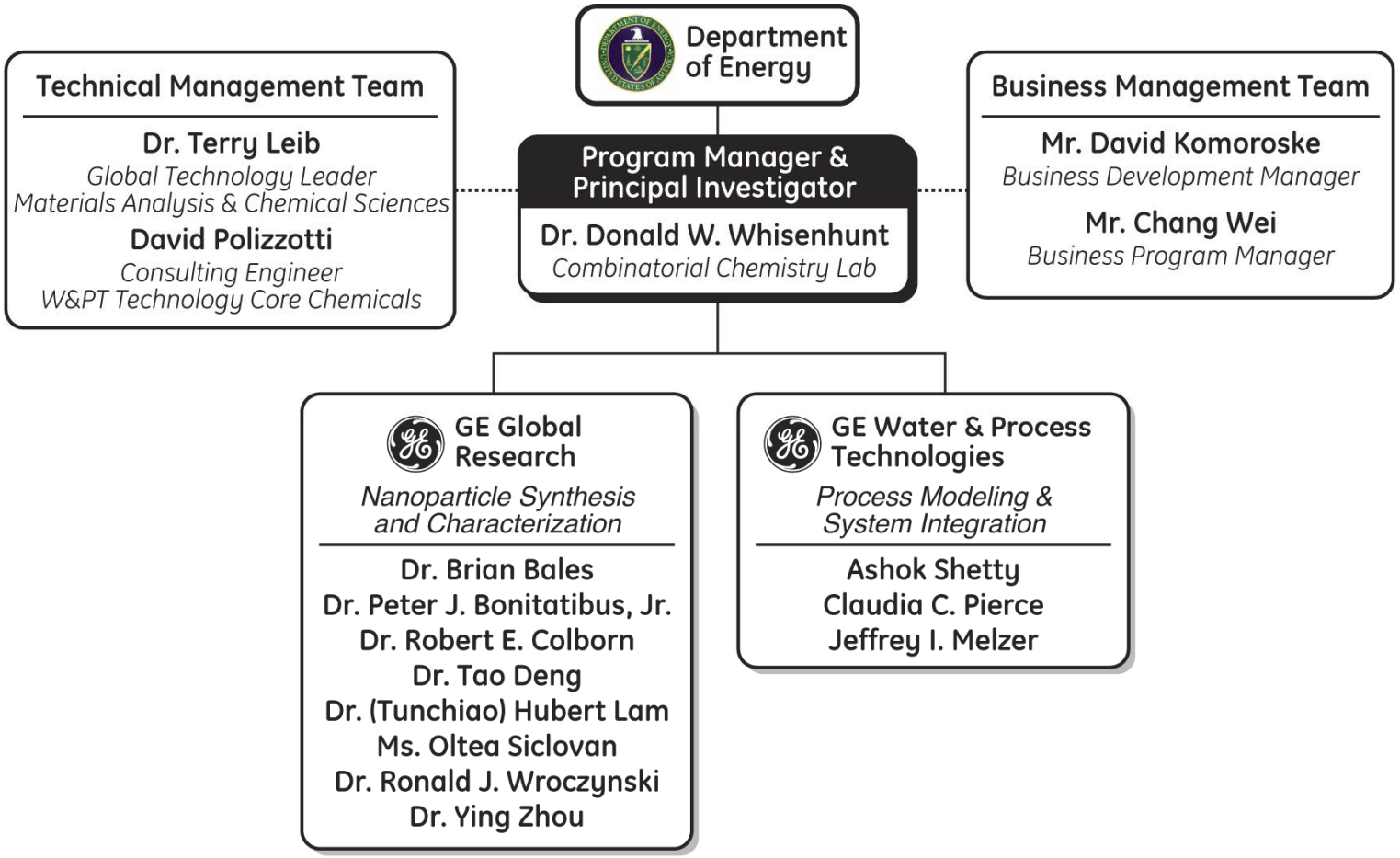
Project Plan



Unique Capabilities in High Throughput Synthesis and Screening

Project Team



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