

# 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

This is GE

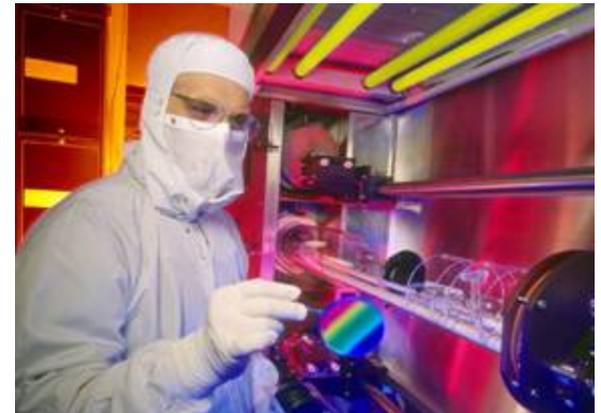
# GE ... a heritage of innovation

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 Capital



## NBC Universal



**hulu**

GE Power and Water

The world today...

# Global trends ...

**Population**



**Consumption**



**Energy Security**



**Environment**

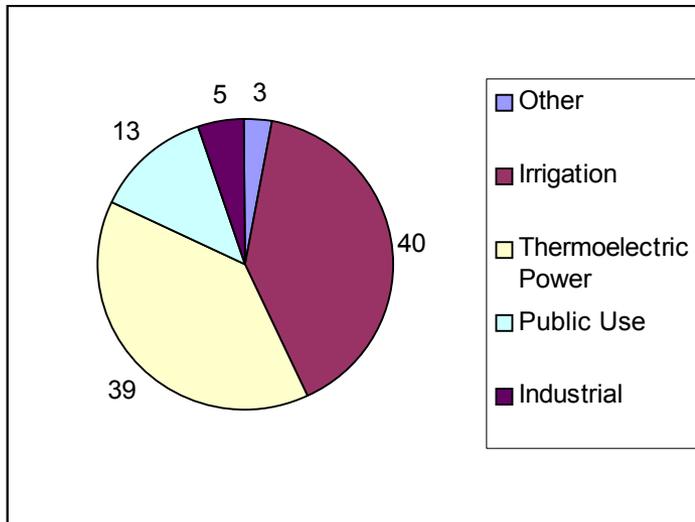


... create big challenges

# Fresh Water Minimization at Coal Fired Power Plants

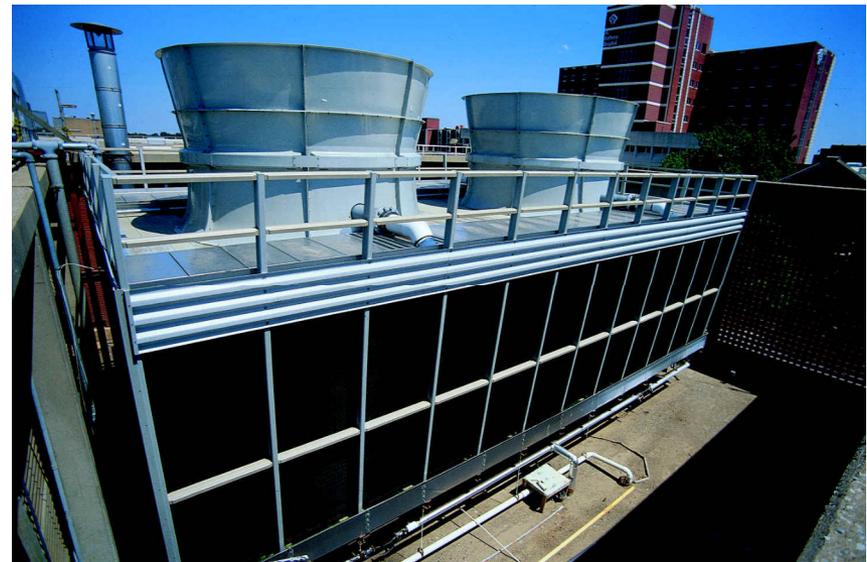
Short Term DOE Goal:

By 2015  
50% Reduction  
\$3.90/kgal

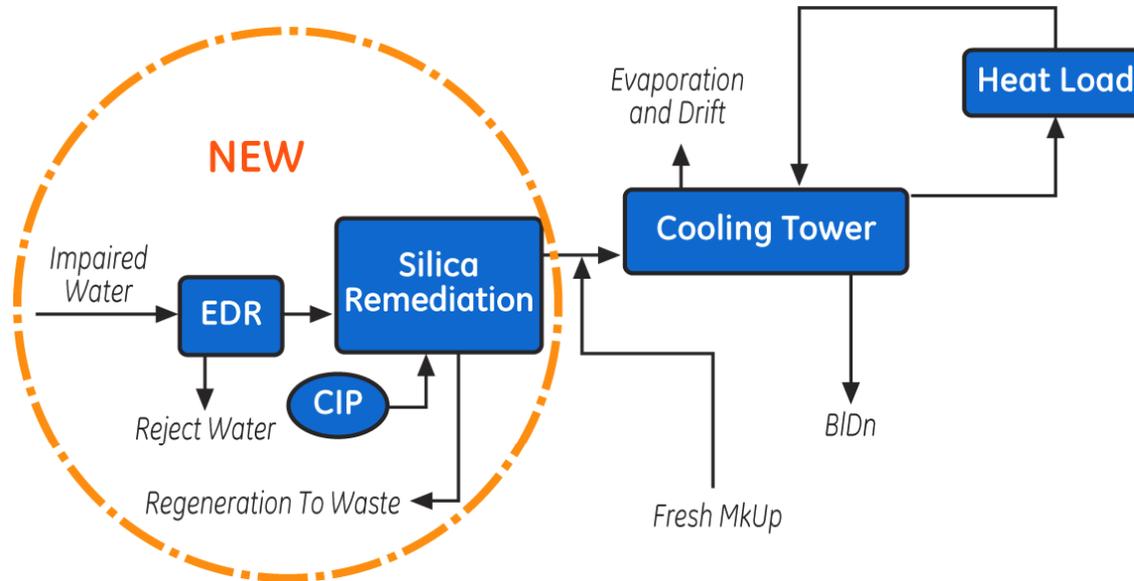


Per-day water use in  
The U.S. = 345 billion gal

From C&EN Oct 6, 2008



# GE Approach



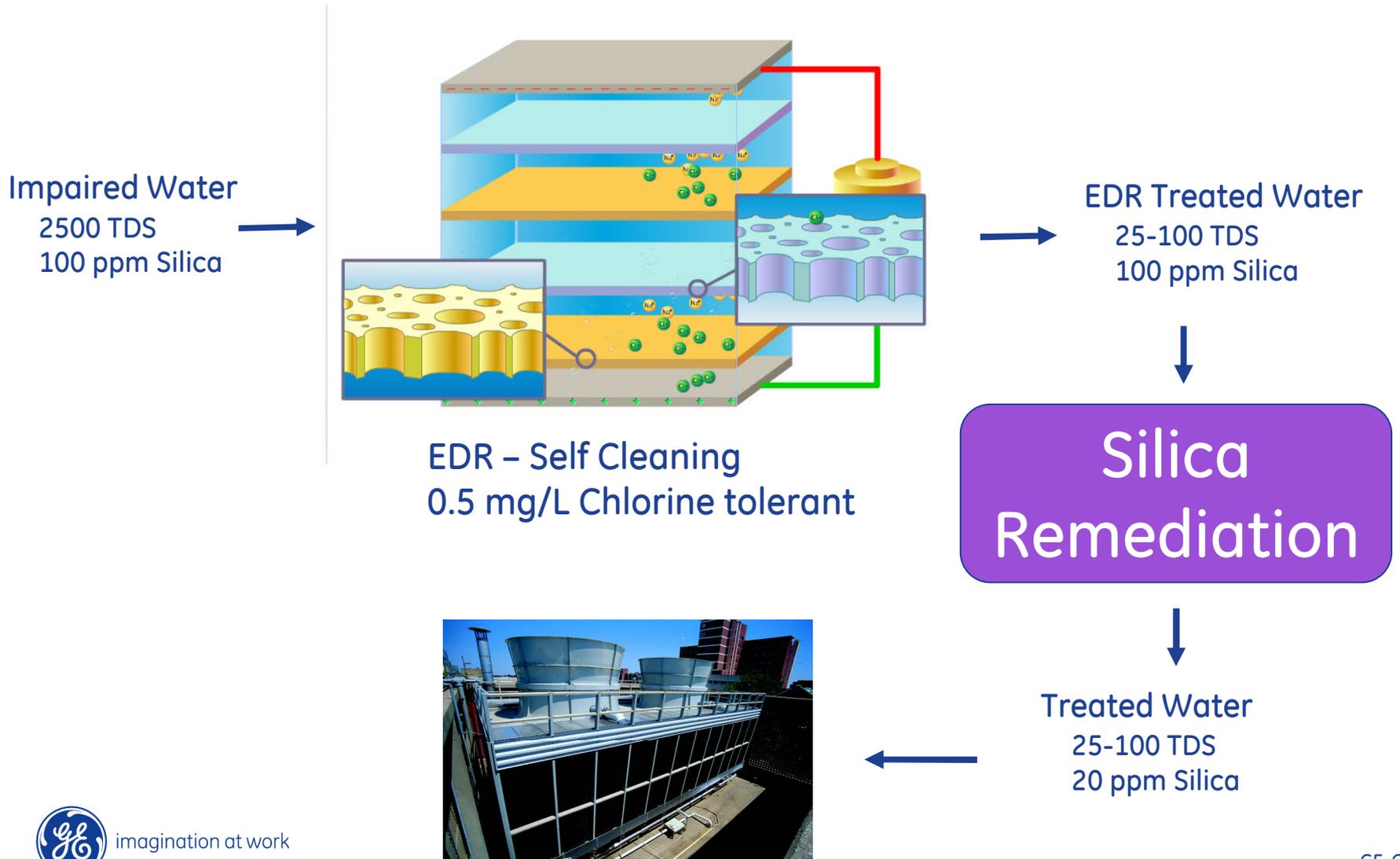
No Change Other Than Use of Impaired Water

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

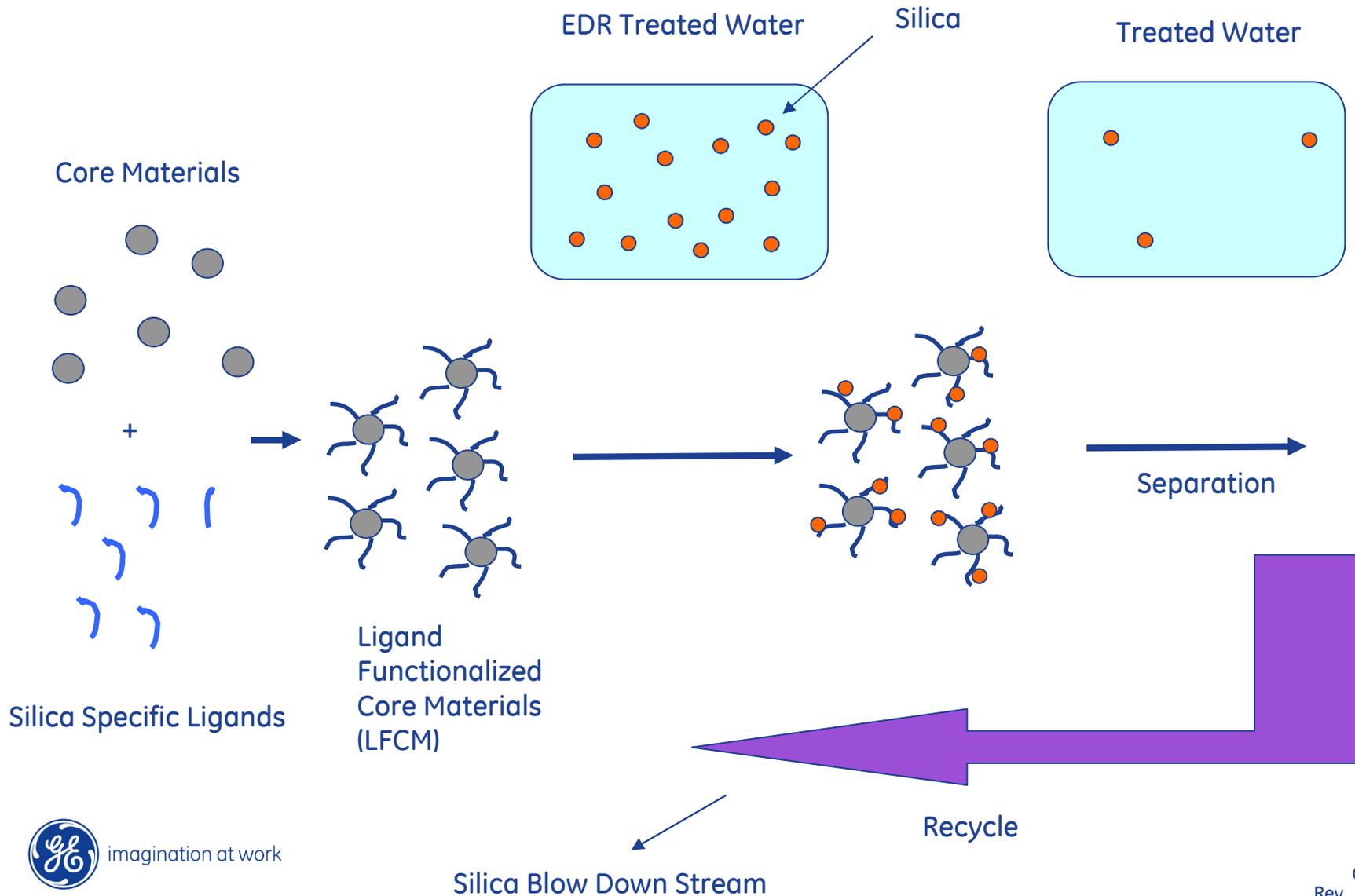
Recirculation Rate = 430,000 gpm Current Cycles = 5

## Novel Silica Remediation Technology Coupled to EDR Solution

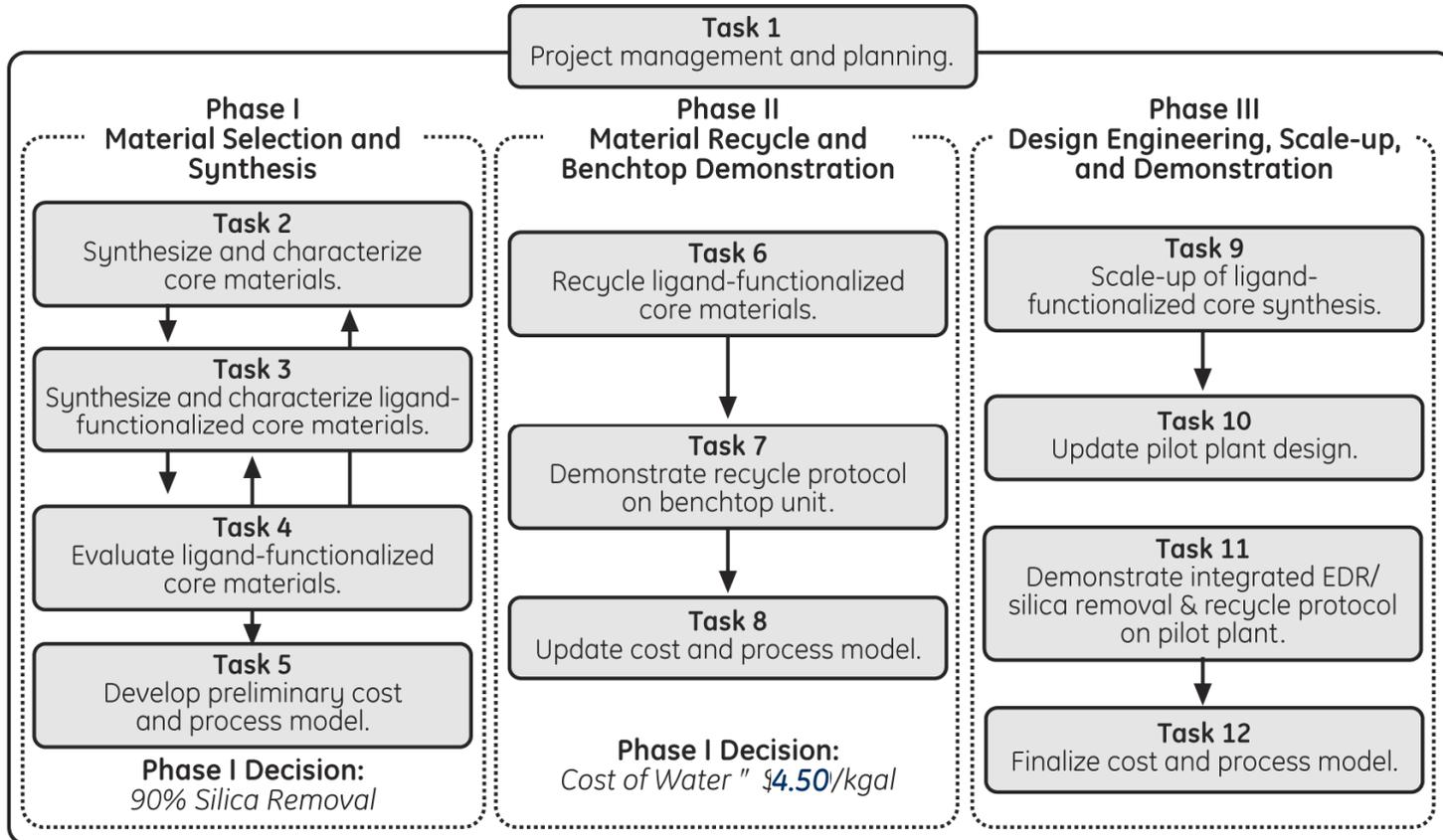
# GE Approach



# Silica Remediation Technology

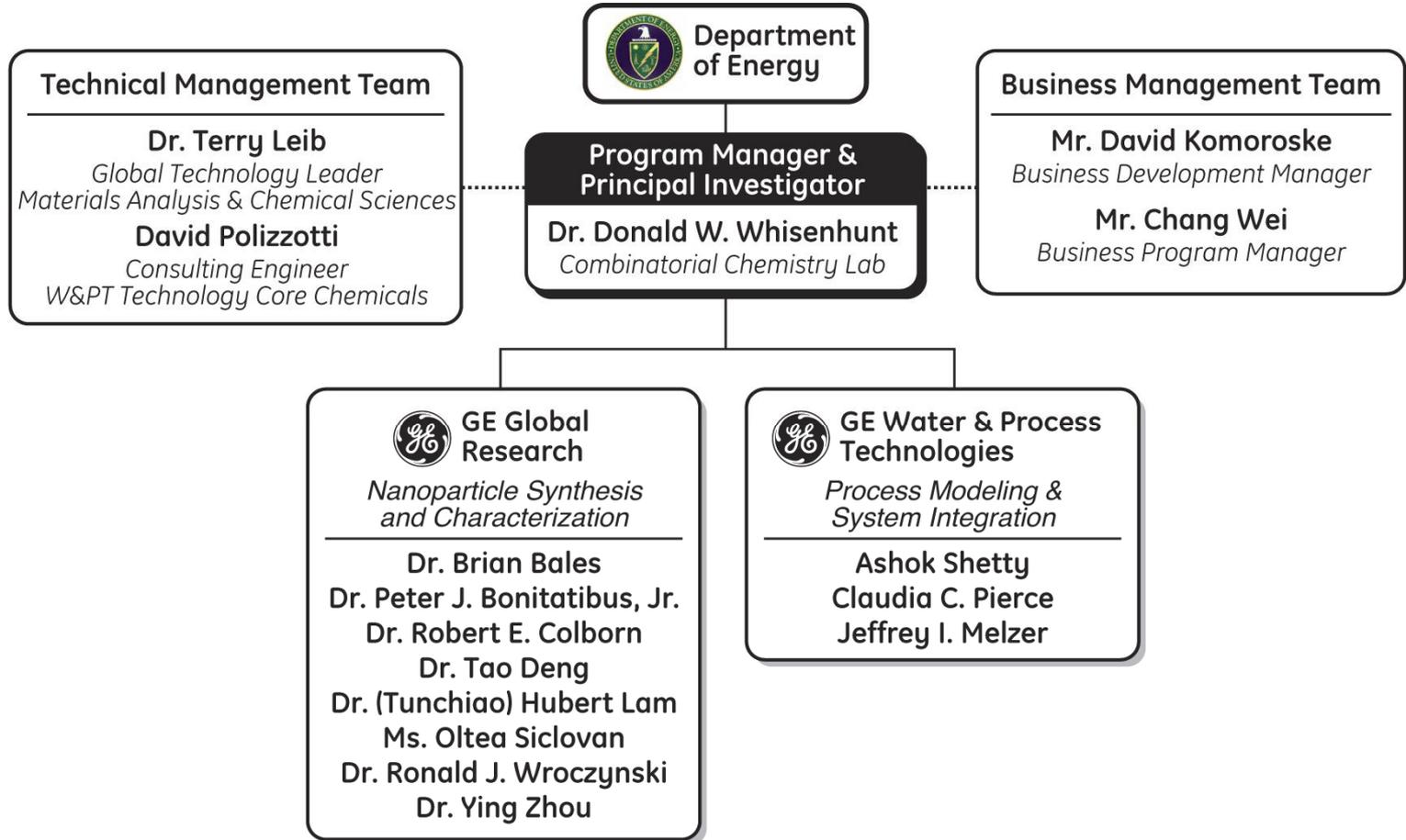


# Project Plan



**Unique Capabilities in High Throughput Synthesis and Screening**

# Project Team





imagination at work