

*A Fixed-Structure Approach
to Mercury Control for
Coal Fired Power Plants*

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McIlvaine Hot Topic Hour

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*Creative Technologies
Worldwide*

URS

Traditional Strategies for Mercury Control



Sorbent Injection

Mercury oxidation chemistry
→capture Hg in scrubber liquor

Fly ash contamination –
Loss of sales/disposal costs

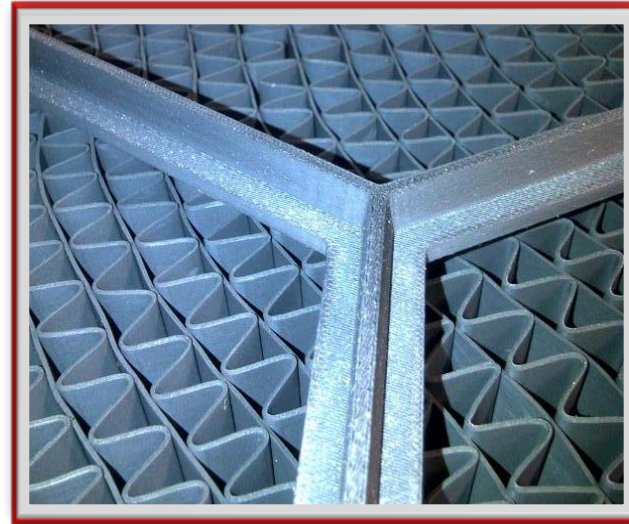
Additives (i.e., Br) can cause
corrosion

Additional PM burden on
collector

Waste water treatment concerns
(i.e., Br, Se)

Sensitivity (SO_3 , Hg species)

Potential Hg Re-emissions from
scrubber

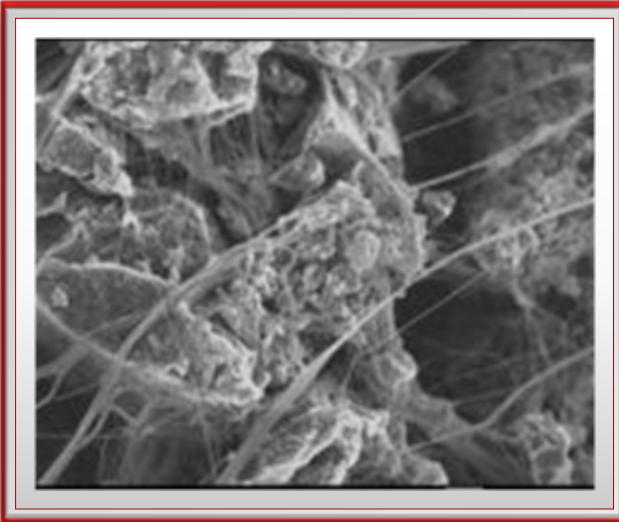


Fixed Sorbent Mercury Control

No Injection of Sorbents or Chemicals

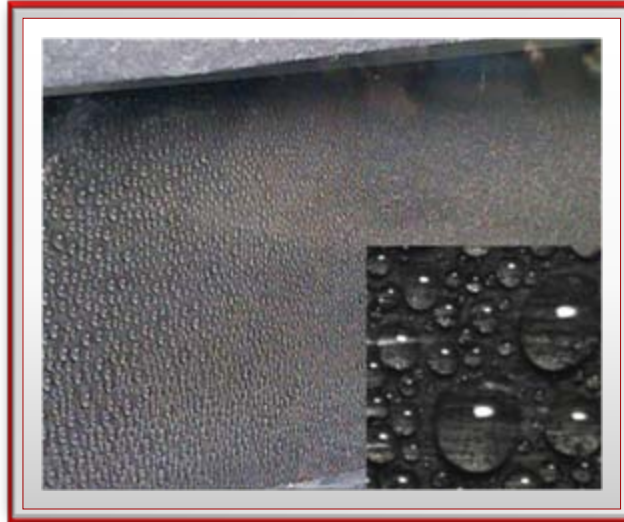
Simple Passive Operation

Robust Mercury Control



Sorbent Polymer Composite (SPC)

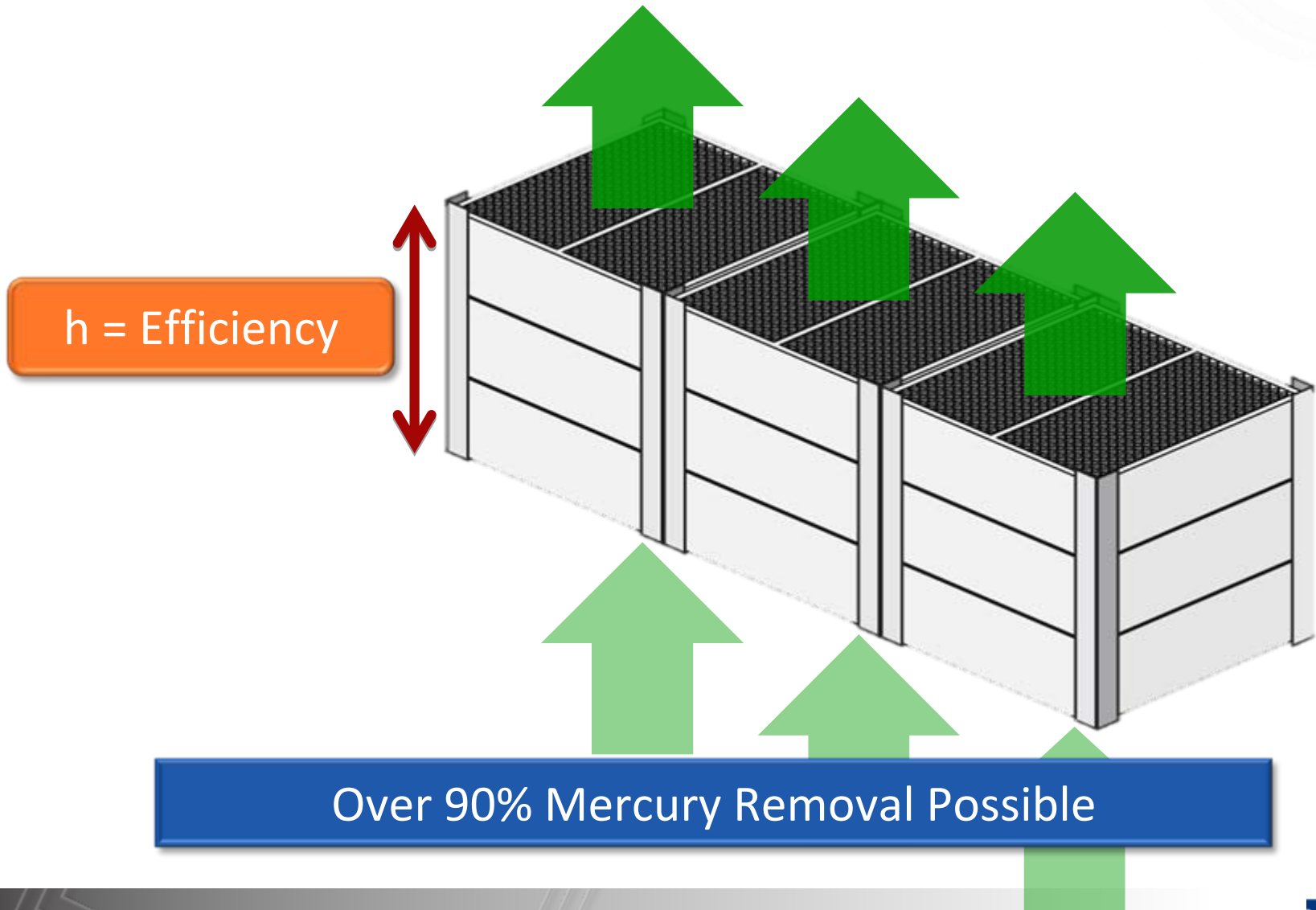
- Novel fluoropolymer material
- Efficiently captures mercury
- High capacity for mercury storage (long lifetime)
- Does not require regeneration
- SO_3 does not inhibit Hg capture



Unique physical-chemical nature

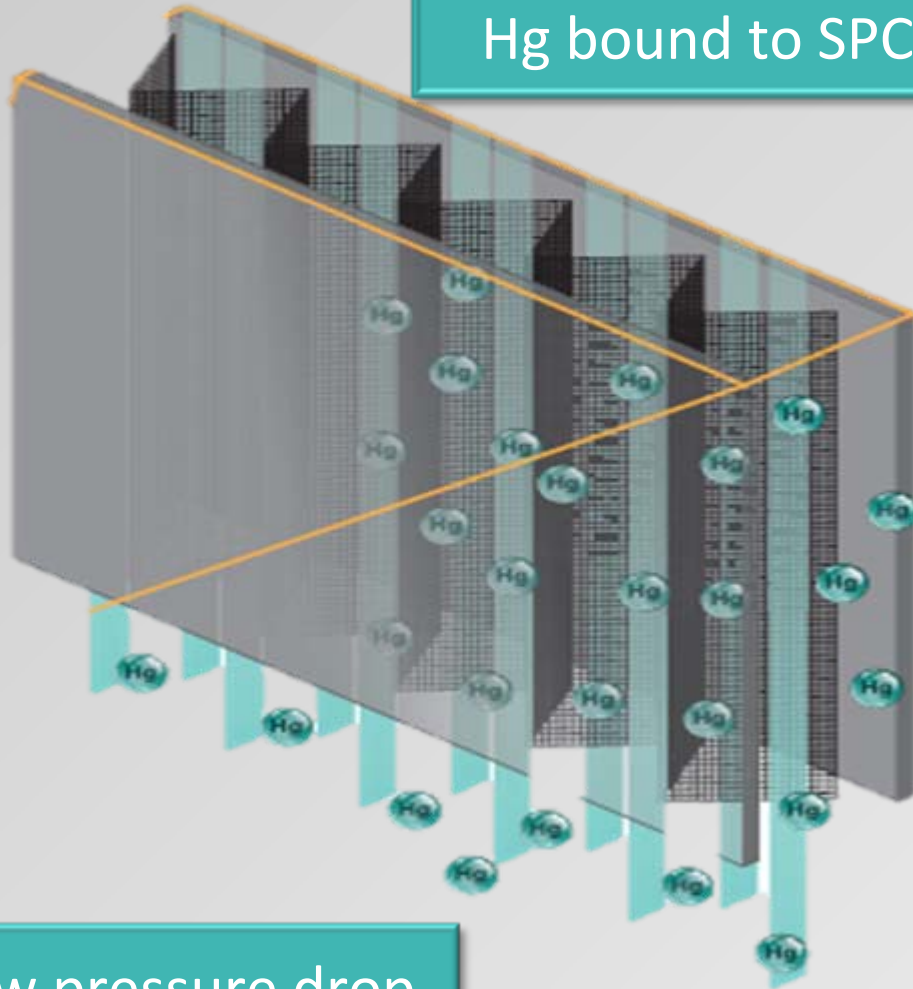
- SO_2 and H_2O are converted into sulfuric acid (catalytic function)
- Liquid sulfuric acid is expelled from the highly hydrophobic structure
- SO_2 removal co-benefit

Discrete Modules

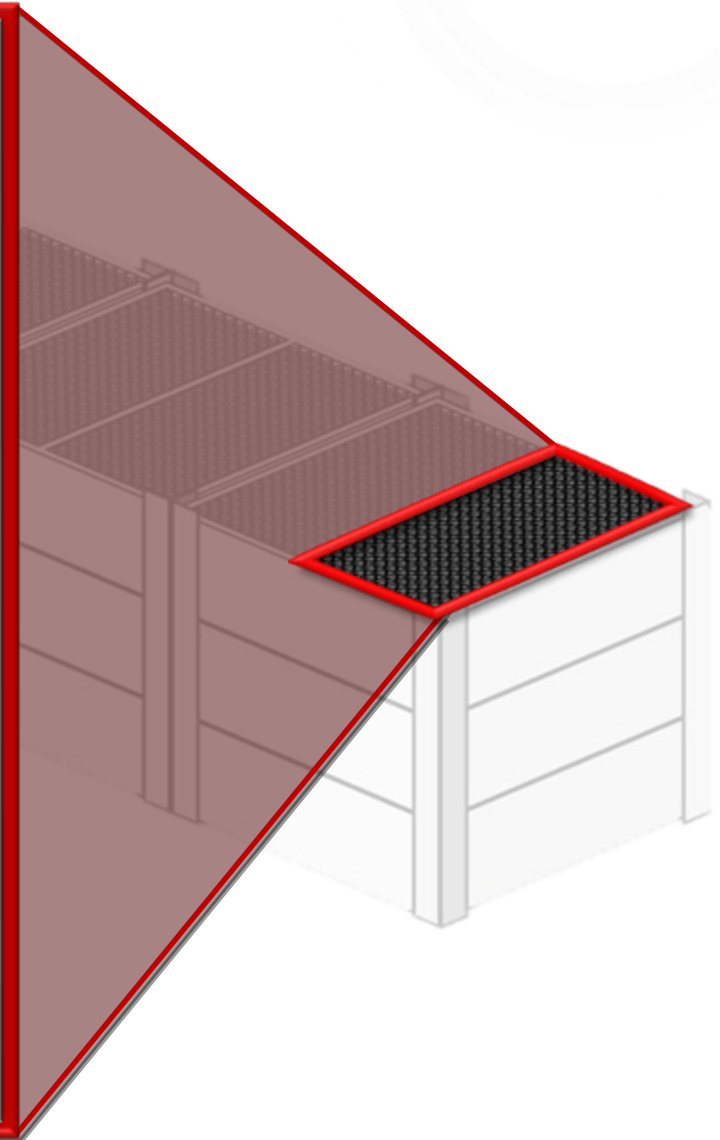


Low Pressure Drop

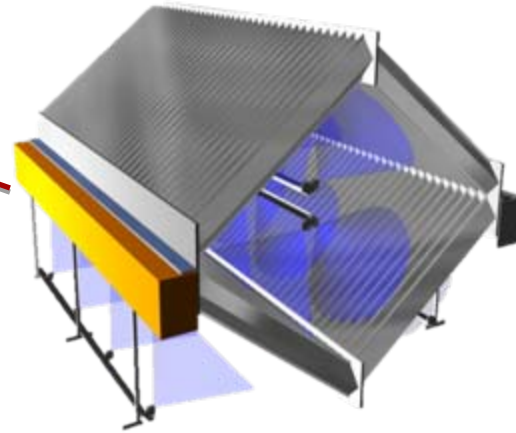
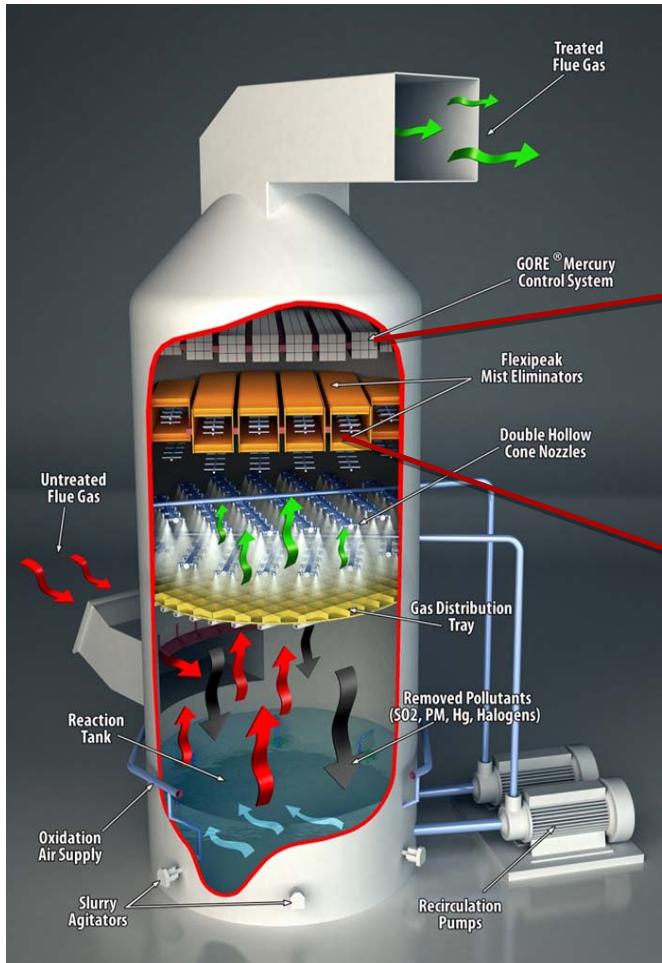
Hg bound to SPC



Low pressure drop



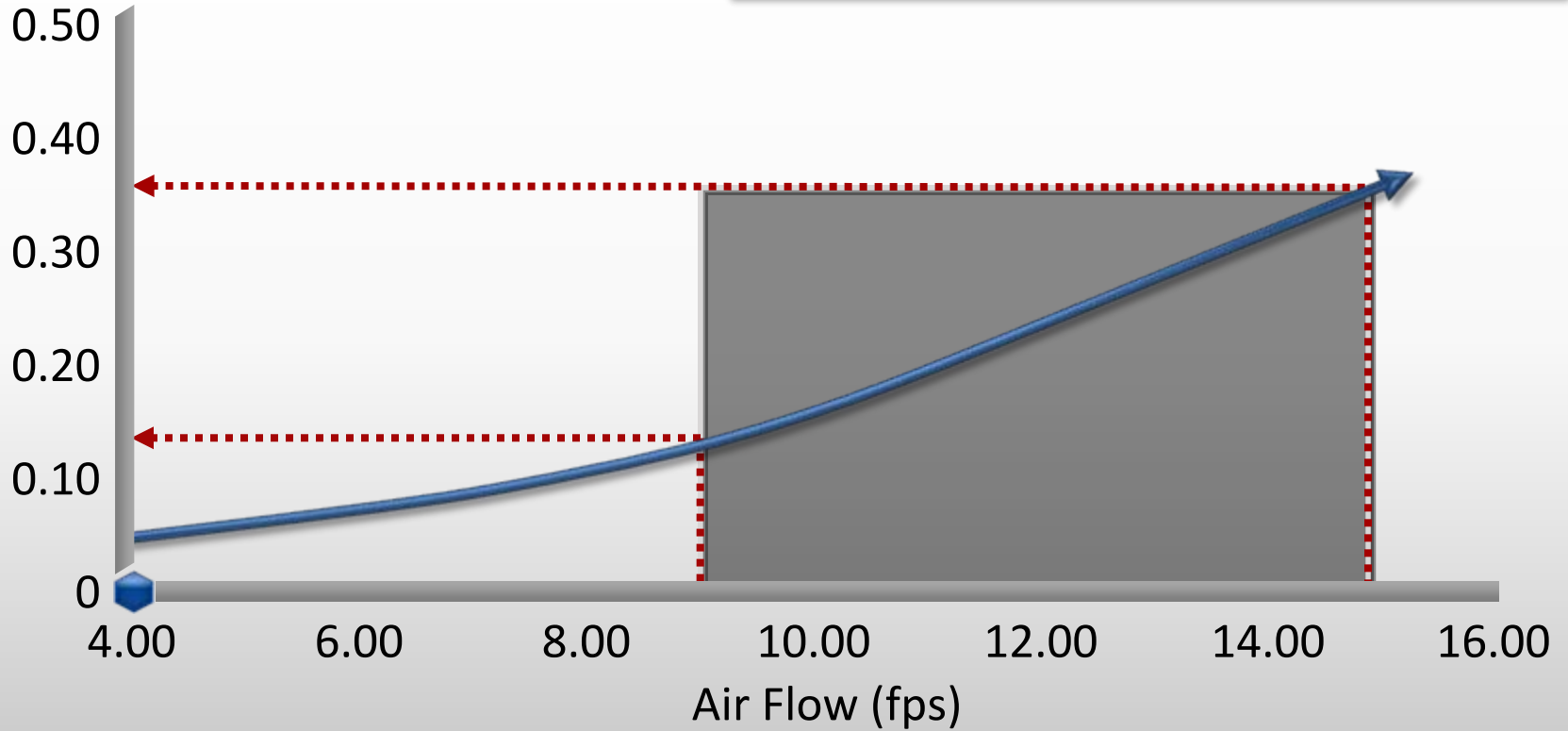
Typical Layout



Pressure Drop

Pressure Drop
(inwg)

1/8th - 1/3rd inch H₂O per module



Scalable Mercury Control



Modules in Operation (Coal Creek Pilot)



Leading Edge of Modules in operation
after ~200 days

Top View of Module Removed
for inspection



Variable Mercury Emissions – No Adjustments

Hg Concentration

$\mu\text{g}/\text{Nm}^3$

120

Hg Inlet Concentration

100

Hg Outlet Concentration

80

60

40

20

0

0

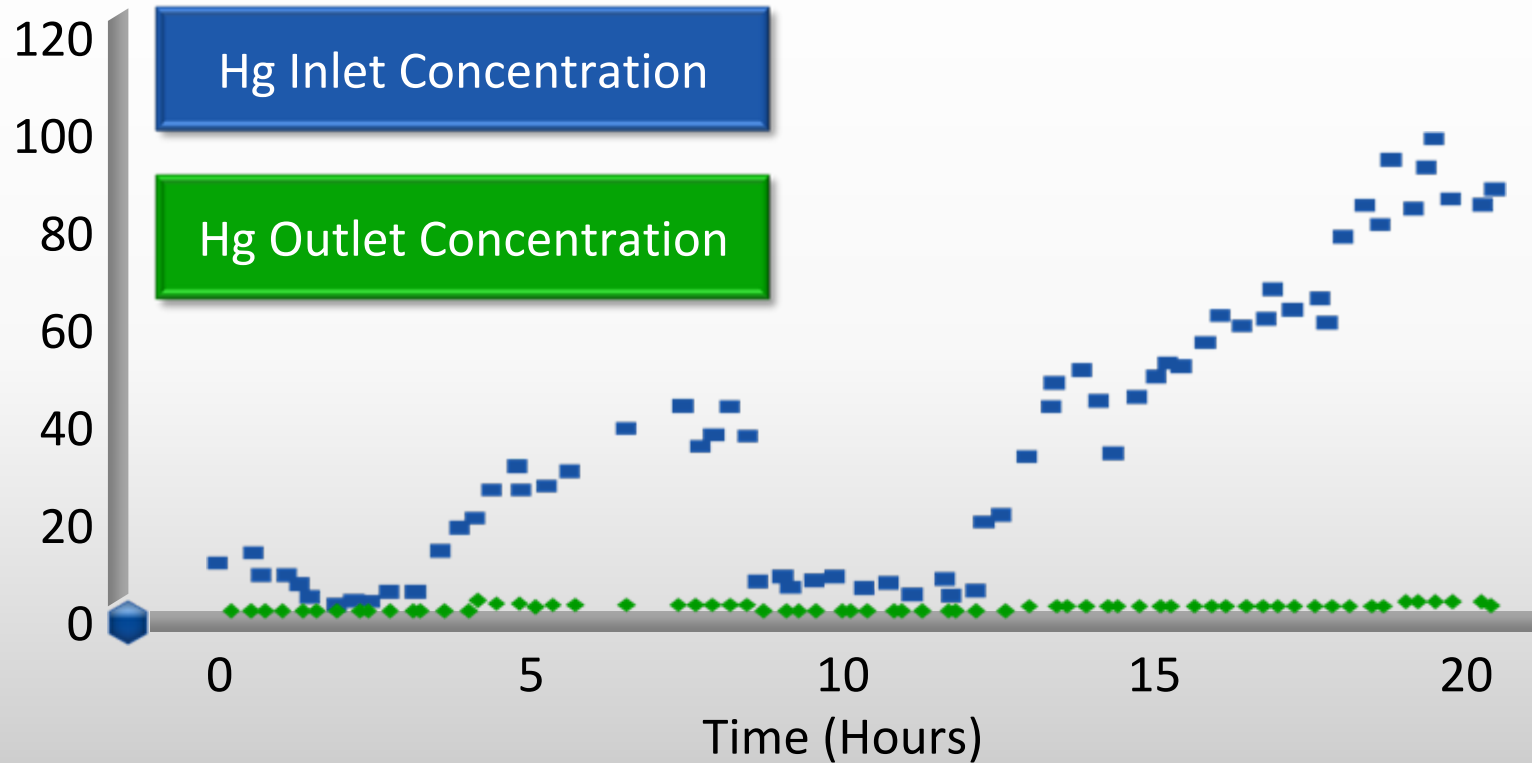
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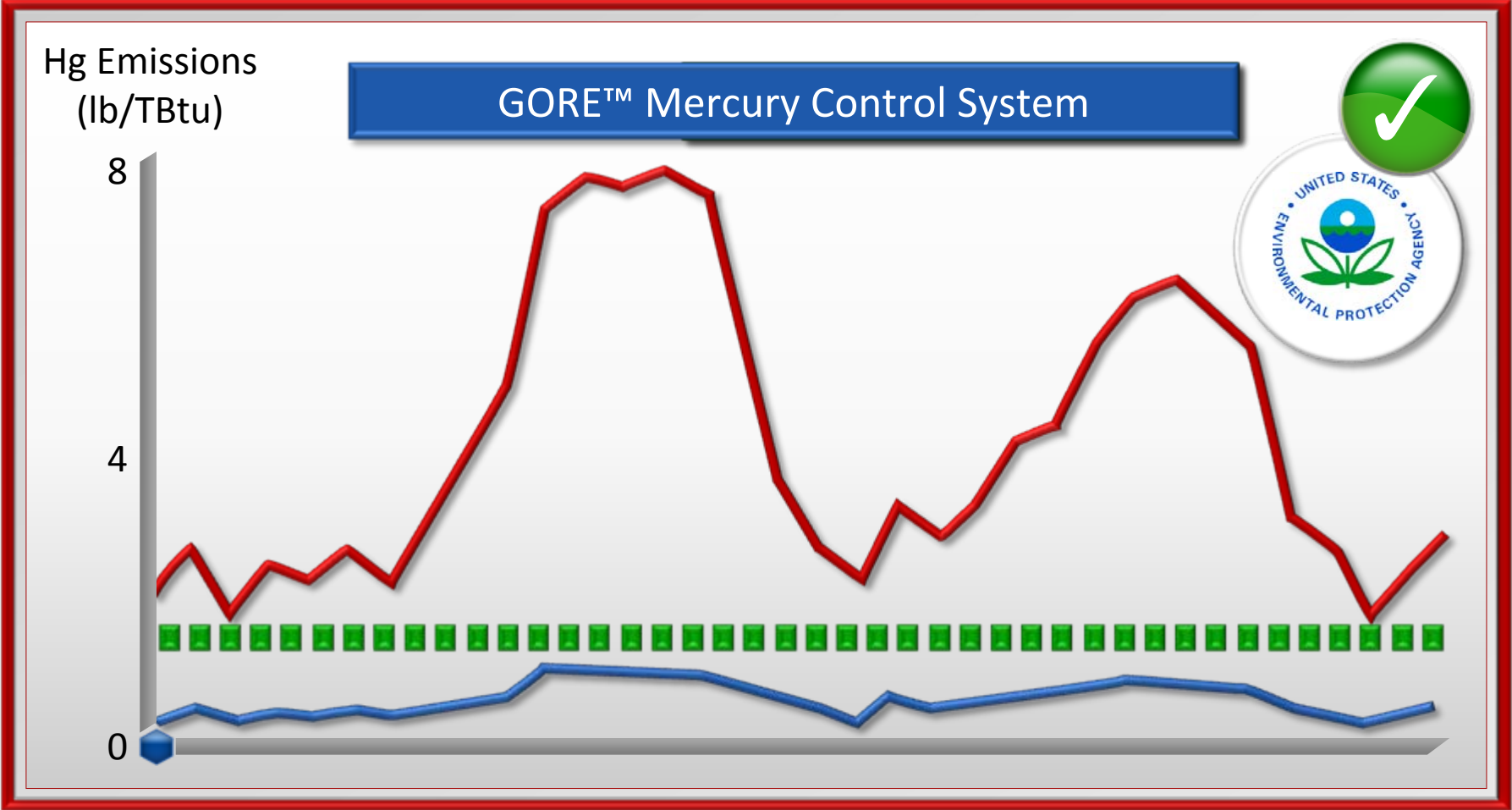
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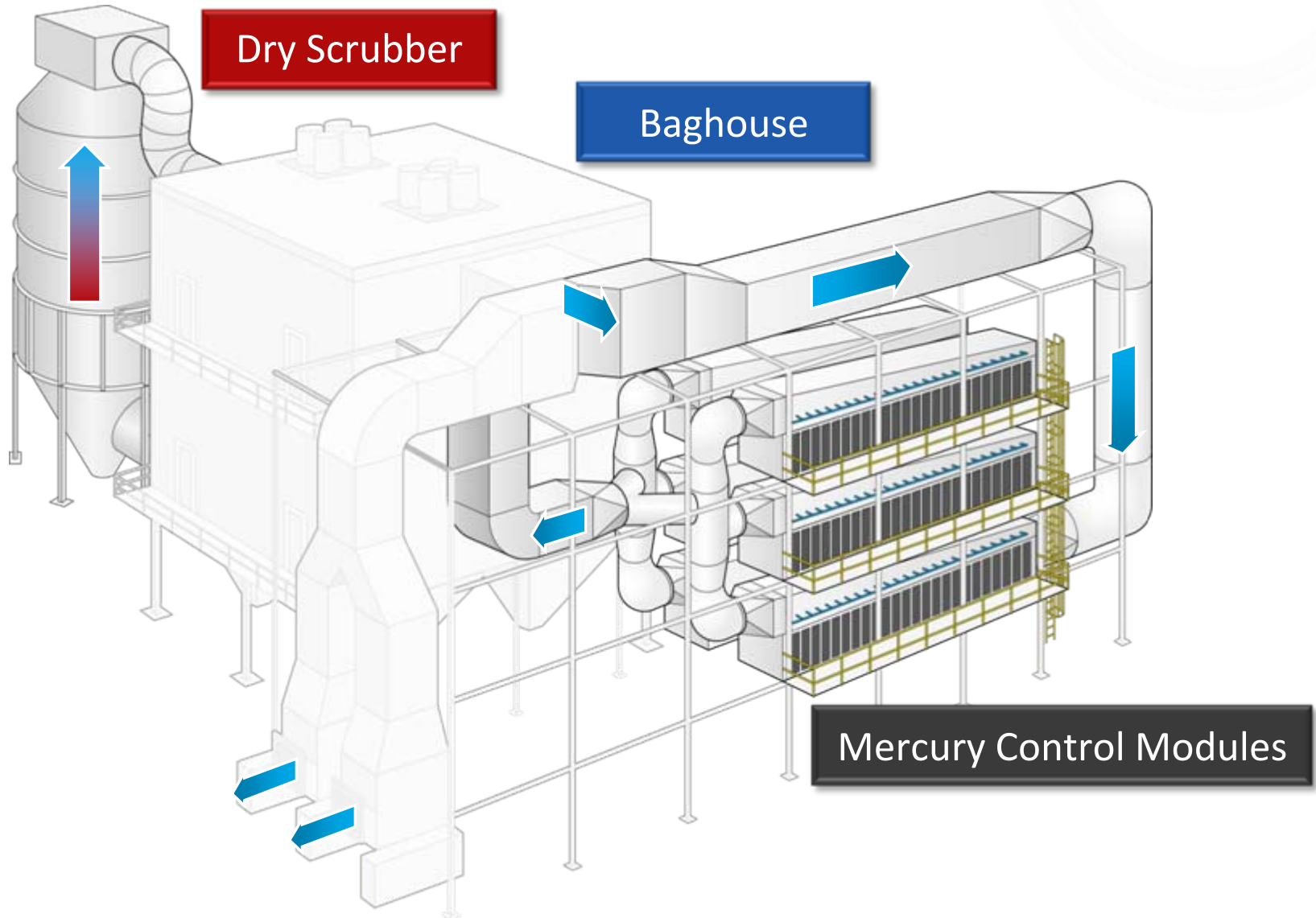
Time (Hours)



Simple Solution for Scrubber Re-emissions



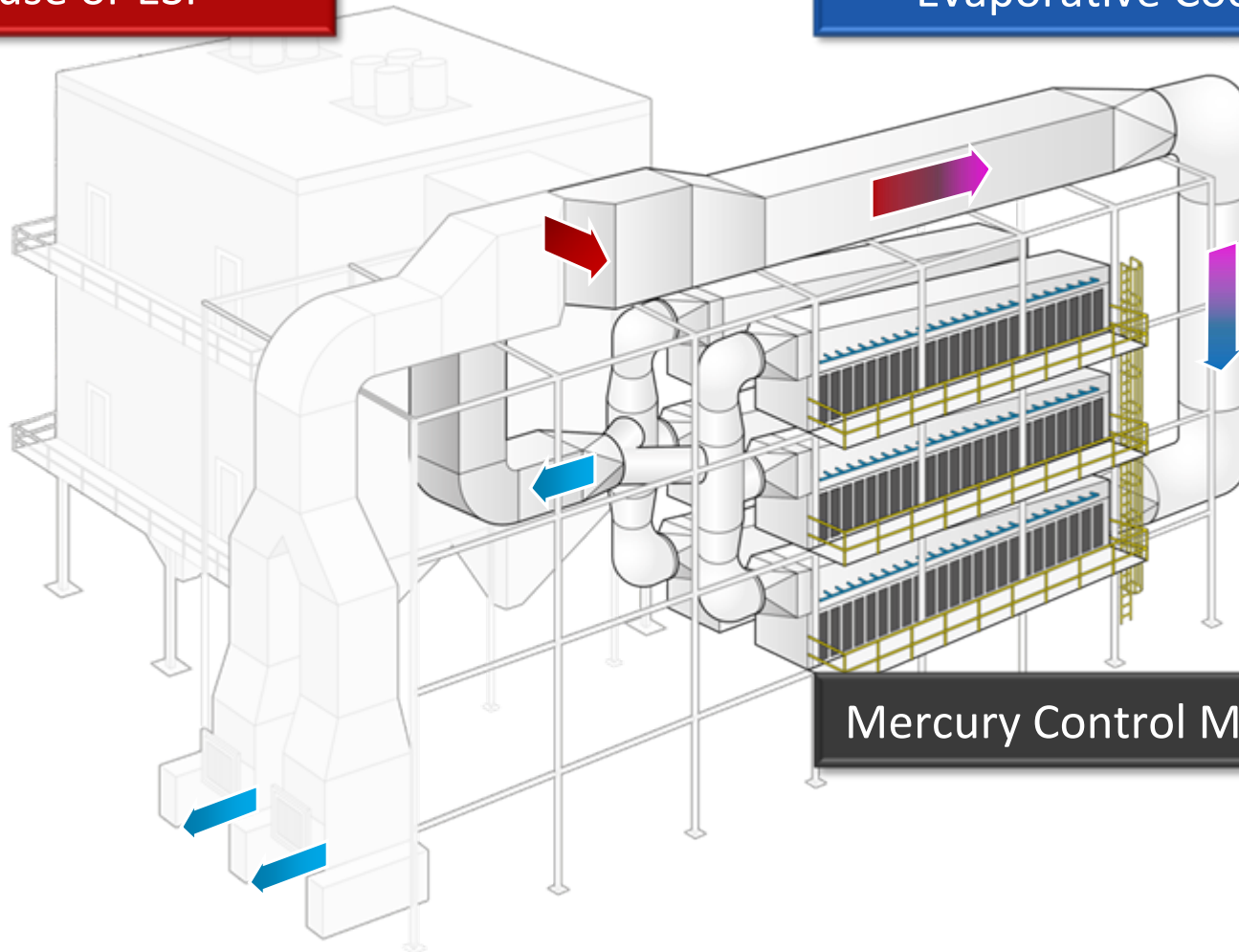
Installation after Dry Scrubber



Installation without Scrubber

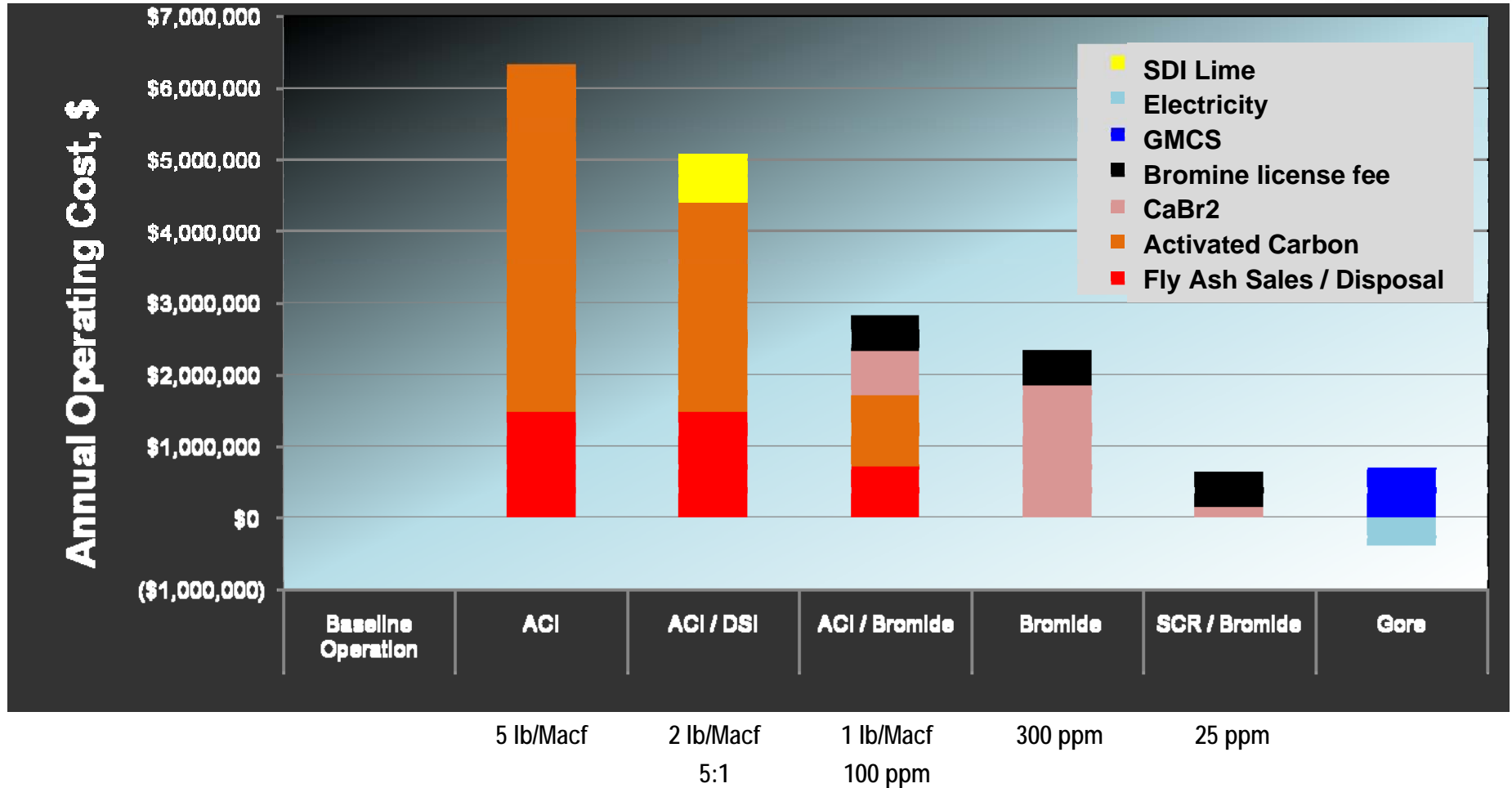
Baghouse or ESP

Evaporative Cooler



Mercury Control Modules

500 MW_e Operating Cost Comparison



GORE™ Mercury Control System



No Carbon Injection

No Fly Ash Contamination

No Additional PM

No Bromine Injection

No Corrosion Concerns

No Wastewater Treatment System Impact

Low Impact

MATS Compliance

GORE™ Mercury Control System



No Moving Parts

No Adjustments In Use

No Regeneration
Required

Low
Impact

Low
Maintenance

MATS
Compliance

GORE™ Mercury Control System



Insensitive to SO_3

Insensitive to Hg Species
(Hg^0 , Hg^{2+})

Fuel Flexibility

Re-emissions Barrier

Low
Impact

Low
Maintenance

MATS
Compliance

Robust

GORE™ Mercury Control System

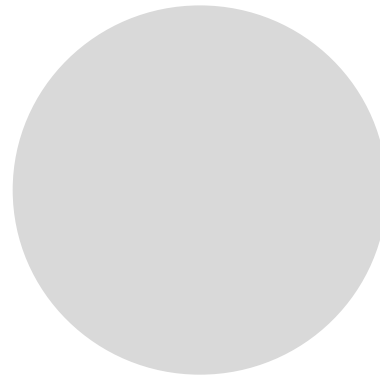


Long Module Lifetime

Low Operating Cost

Zero Footprint

SO₂ Removal Co-benefit



Low Impact

Low Maintenance

MATS Compliance

Cost Effective

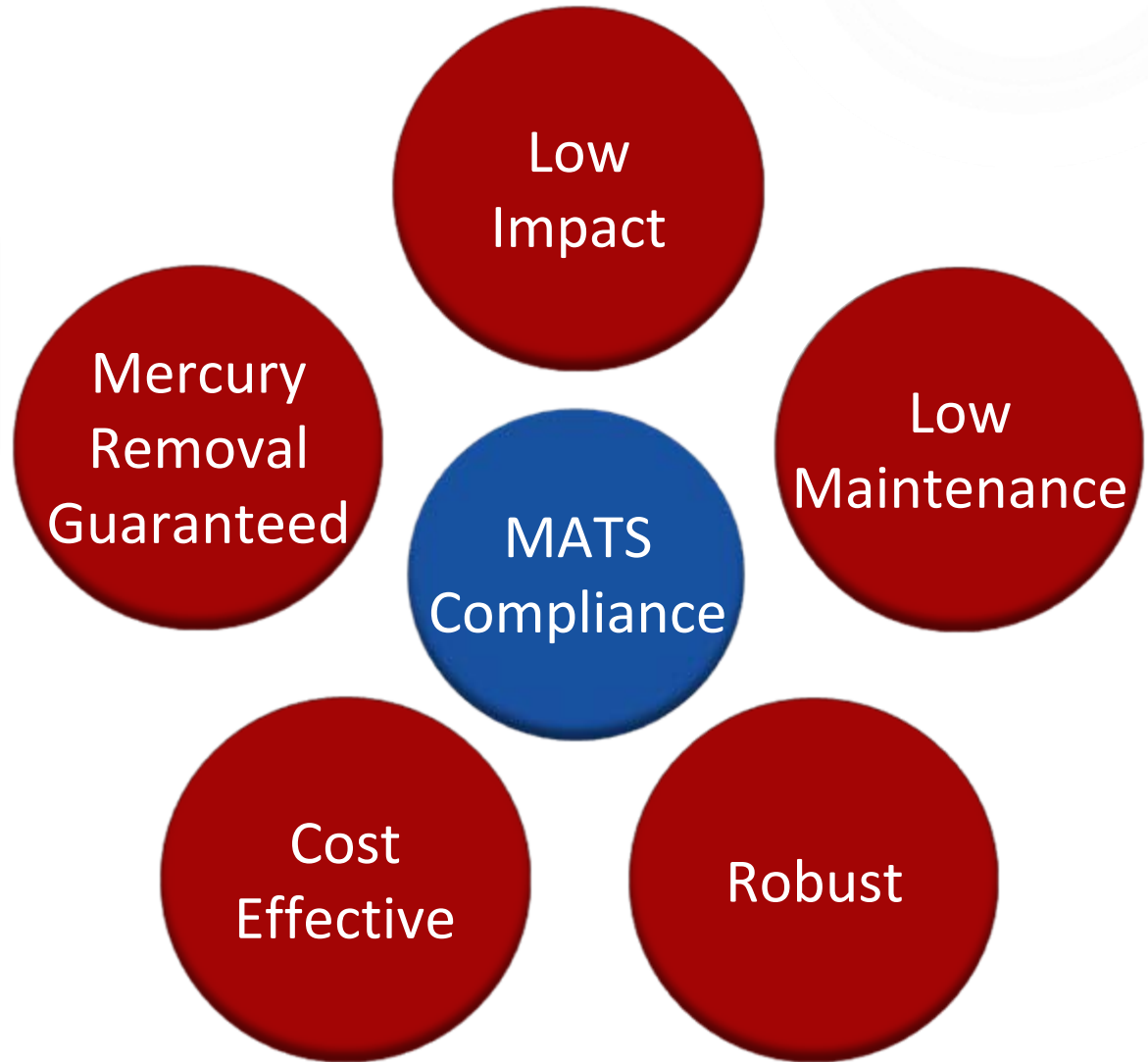
Robust

GORE™ Mercury Control System

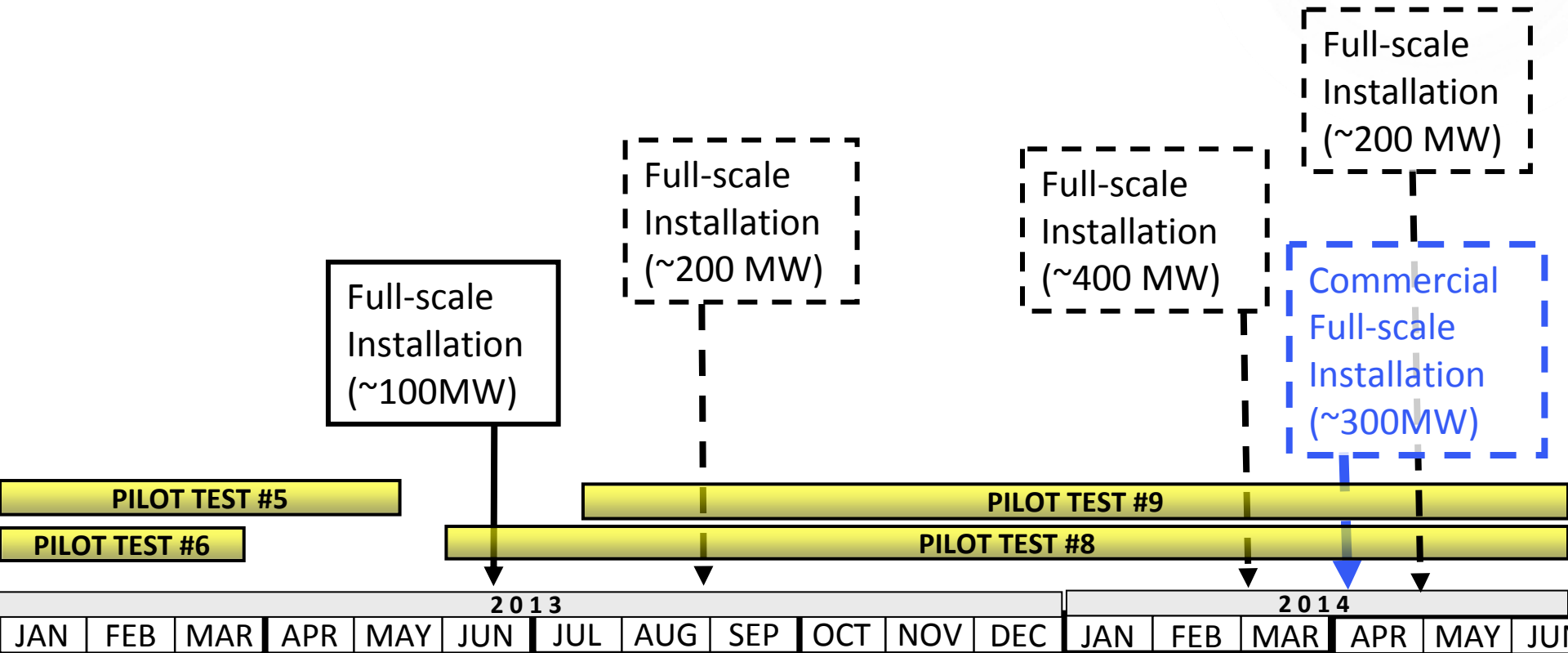


“Tailpipe” solution

Commitment to Fitness-for-Use



Planned Activities Next 12 months



Low Volume Module Production

High Volume Module Production



Contact Information



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