

Dry Flue Gas Desulfurization for Power Plants



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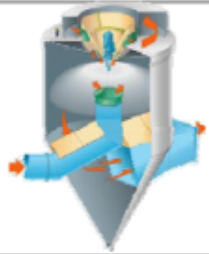
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Dry FGD Acid Gas Control Technologies



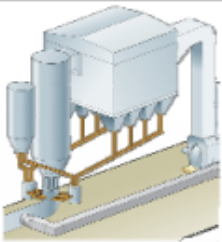
Dry Sorbent Injection

- 60/80+% SO₂ removal (ESP/FF)
- Hydrated lime, trona or sodium bicarbonate
- Inject before particulate control device
- Consider impact on fly ash disposal
- Lowest capital investment



Spray Dry FGD System w/ HLI

- Up to 98% SO₂ removal
- Up to medium sulfur fuels (<5-6 lbSO₂/mmbtu)
- Lime reagent
- Particulate control follows scrubber
- Dry byproduct – limited beneficial use
- Applied to small and large (900MW) units

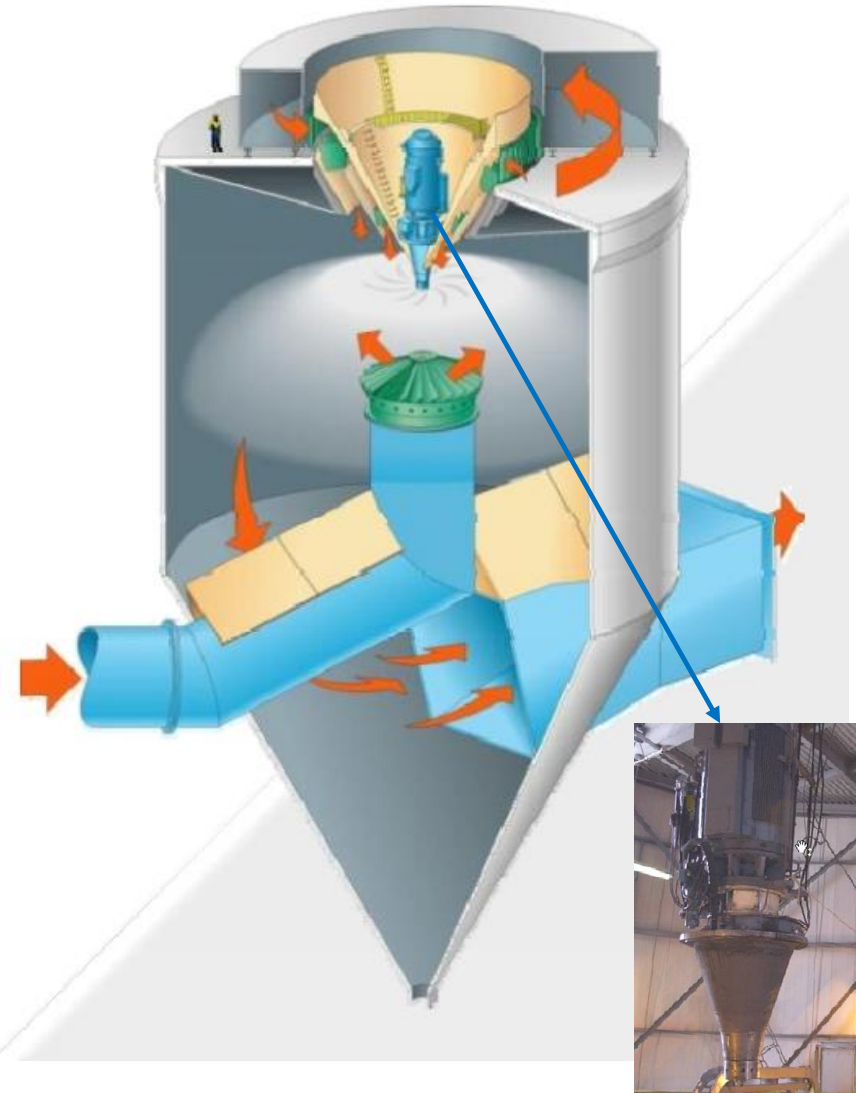


Circulating Dry Scrubber

- Up to 98% SO₂ removal
- Up to medium sulfur fuels (<5-6 lbSO₂/mmbtu)
- Lime reagent
- Particulate control follows scrubber
- Dry byproduct – limited beneficial use
- Best applied to small units

Spray Dry Absorber (SDA) with Rotary Atomizer

- Standard module designs that surround the atomizer spray cloud with flue gas from above and below
- Smooth turndown for load following for about 5:1 turndown ratio
- One machine/SDA requires less maintenance
- Maximum atomizer-to-wall spacing
- Operating single boiler SDA system designs up to 900 MW
- Operating designs from low to medium sulfur fuels

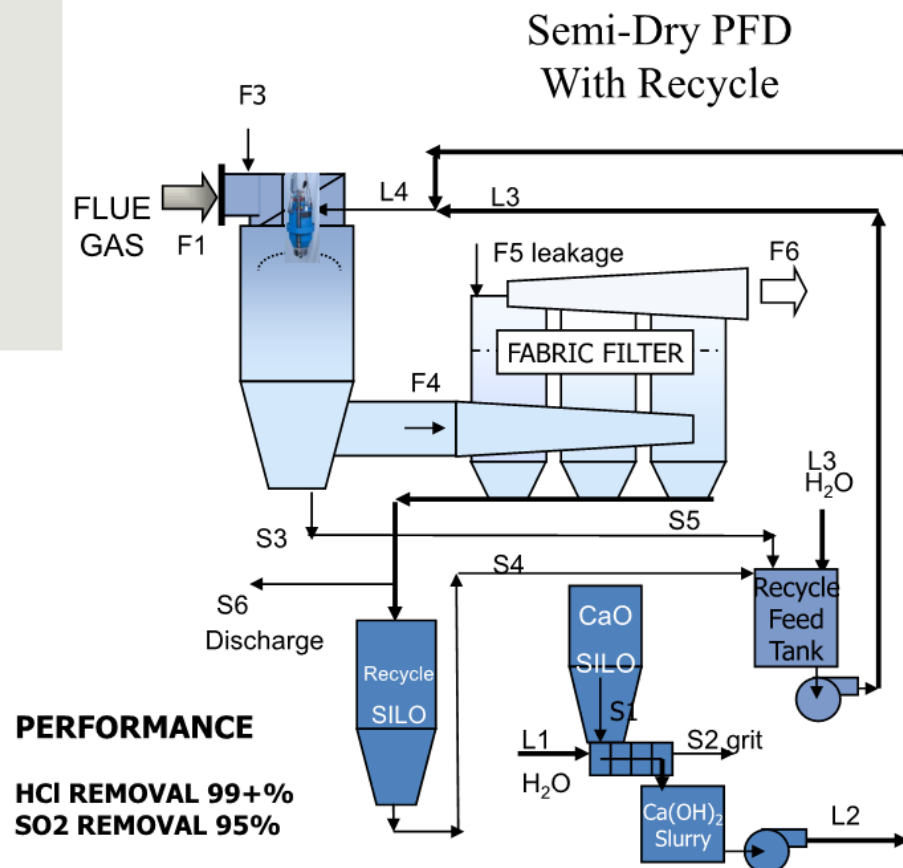


Rotary Atomizers with SDA

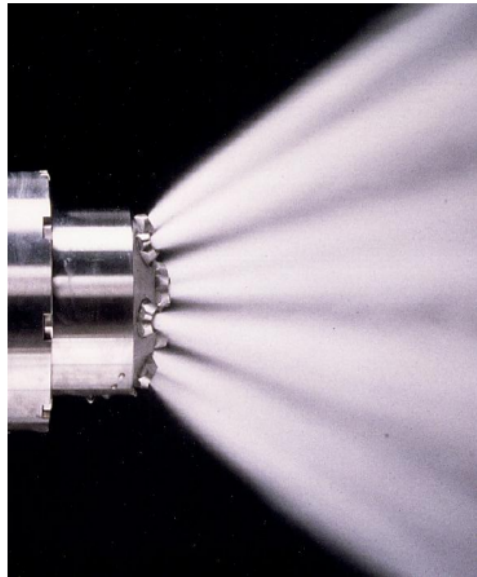


MODELS	
MODEL 900	
Power Output	75 HP (55KW)
Speed Range	14,000 - 16,000 rpm
Maximum Feed*	40 US GPM (9.0 m ³ /hr)
Size/Weight	15" (375 mm) dia. X 23" (575 mm) high 300 lbs (135 kg)
Wheel	7.75" (196 mm) dia Titanium or Hastelloy w/ ceramic or carbide inserts
MODEL 1500	
Power Output	235 HP (175KW)
Speed Range	10,000 - 12,500 rpm
Maximum Feed*	100 US GPM (22.5 m ³ /hr)
Size/Weight	28" (700 mm) dia. X 54" (1350 mm) high 1800 lbs (800 kg)
Wheel	10" (250 mm) dia

* Multiple machine configurations available



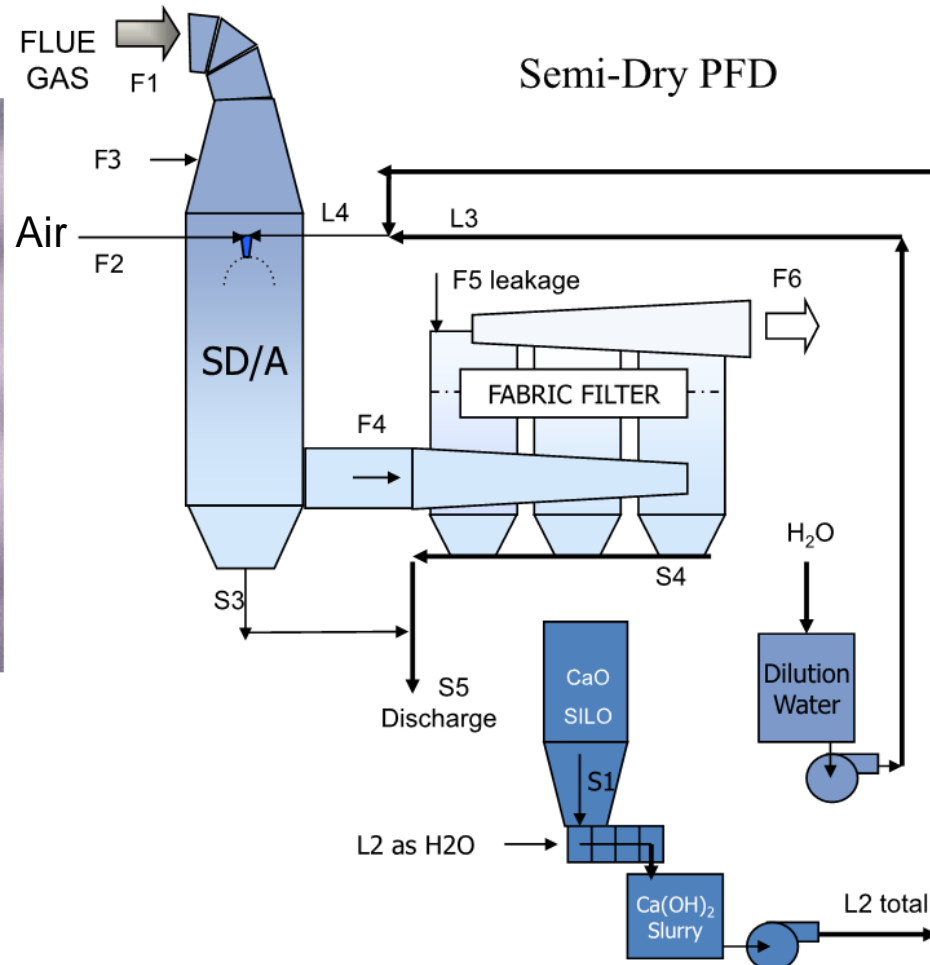
Dual Fluid Atomizers with SDA



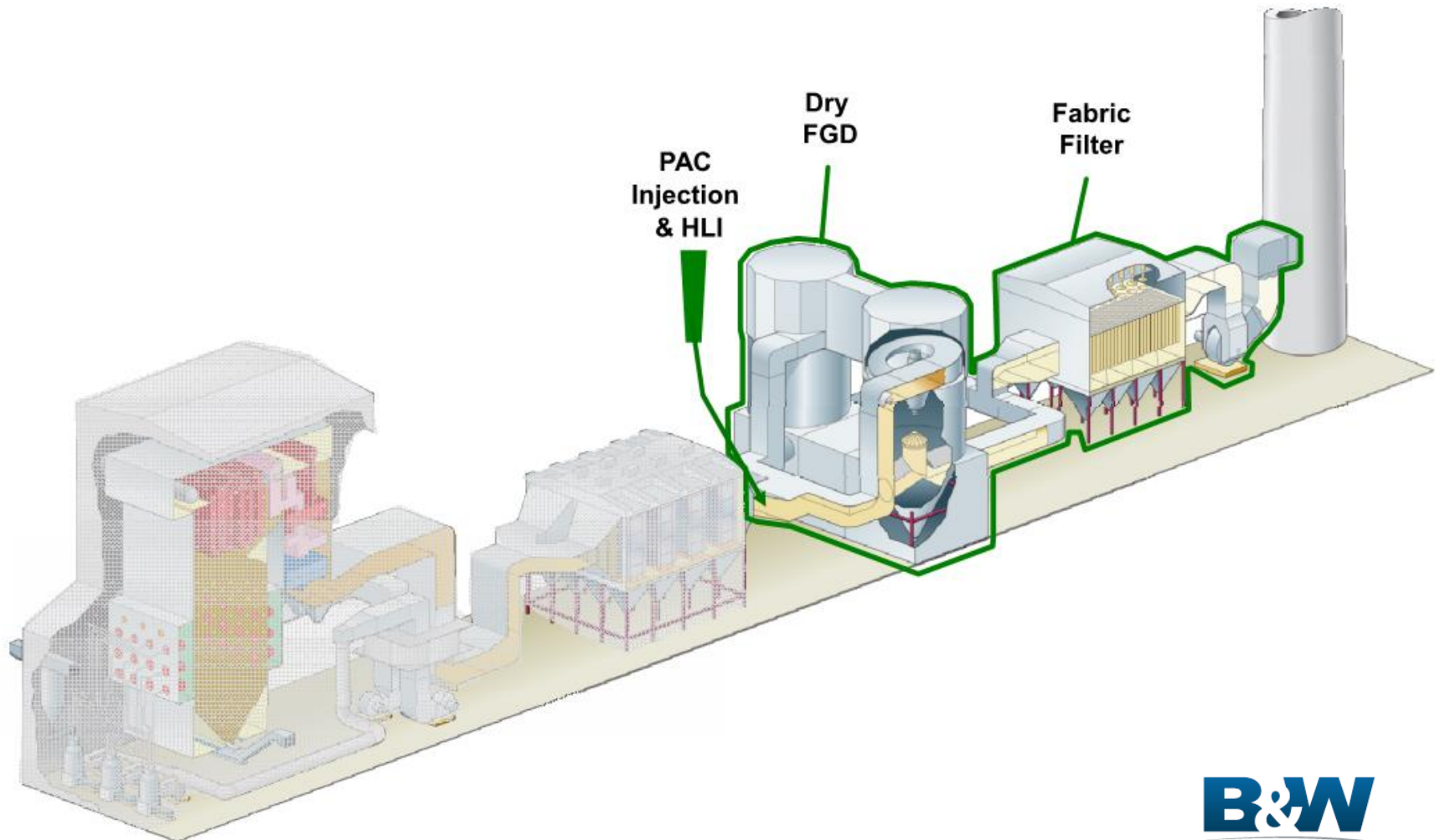
Turbosonic Dual Fluid Nozzle

PERFORMANCE

HCl REMOVAL 99+%
SO₂ REMOVAL 95%



Typical Retrofit SDA Arrangement

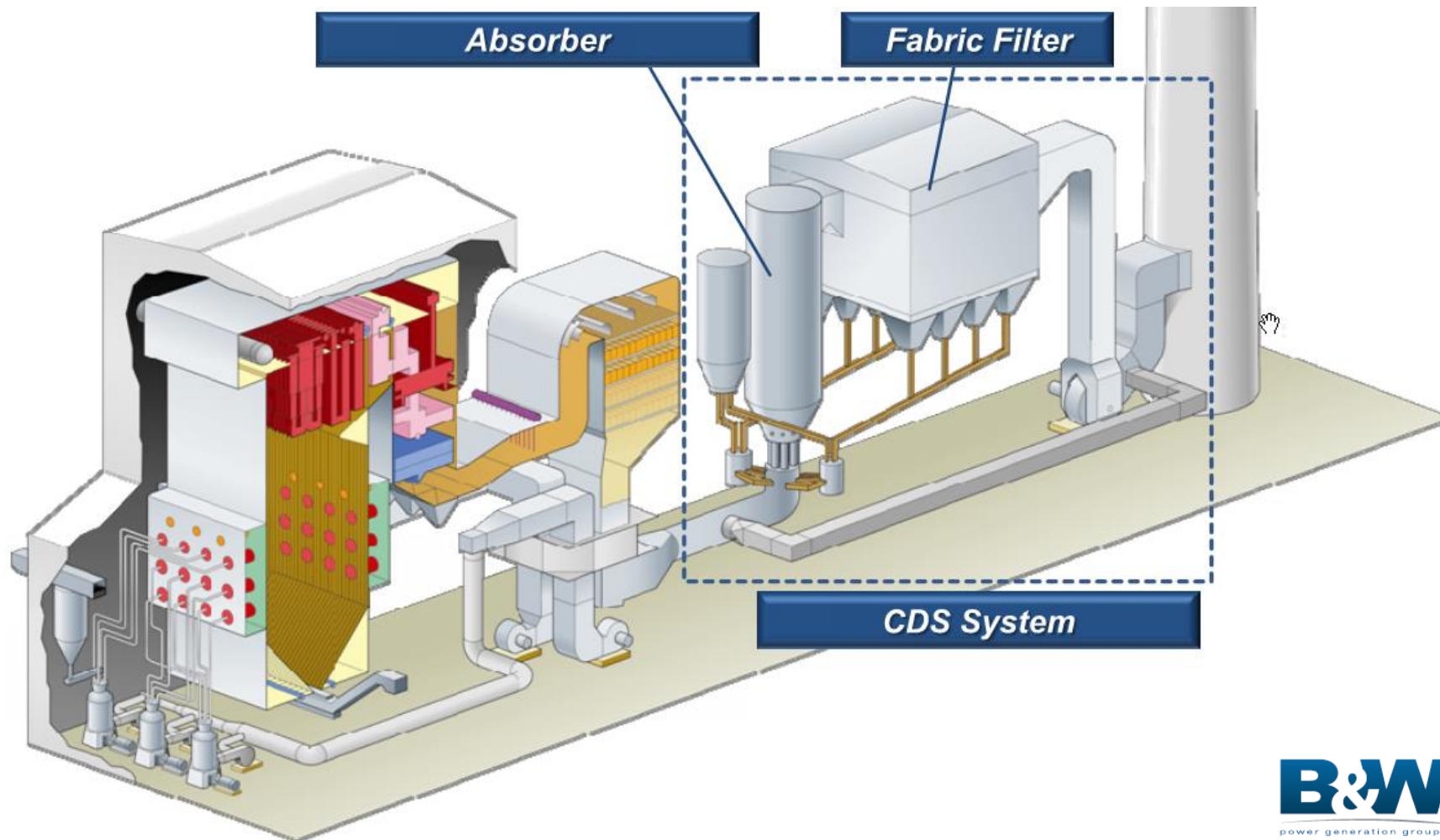


B&W's Hydrated Lime Injection (HLI) Upstream SDA

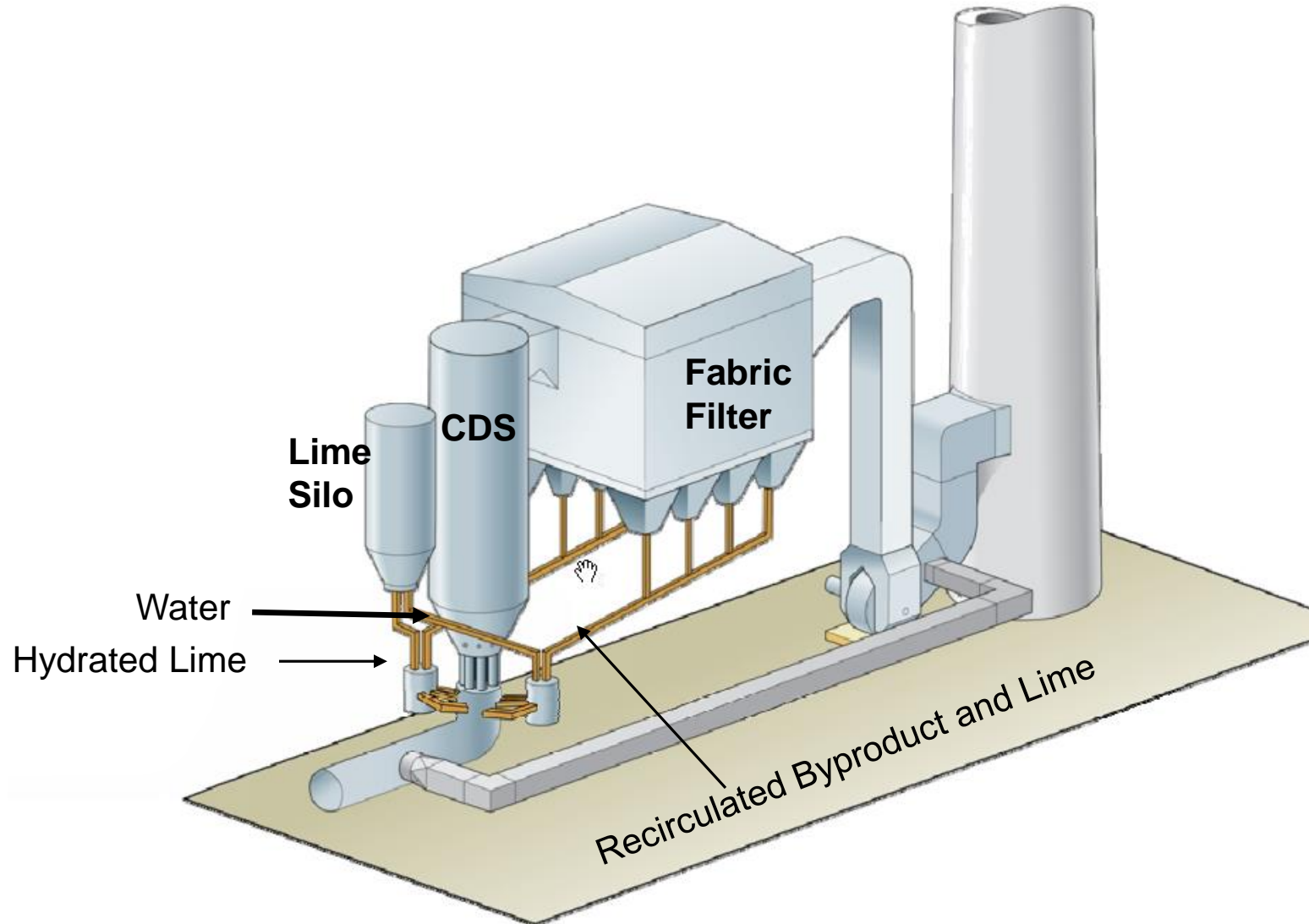
- Inject hydrated lime upstream of the SDA
- Decouples the lime addition from the water addition
- Removes the prior limitations of the SDA system
- Extends inlet sulfur range to 6 lb SO₂/MBtu and increases removal rates
- Inlet HLI can also remove the requirement for a lime slurry system or reduce the capacity or sparing on the lime slurry system.



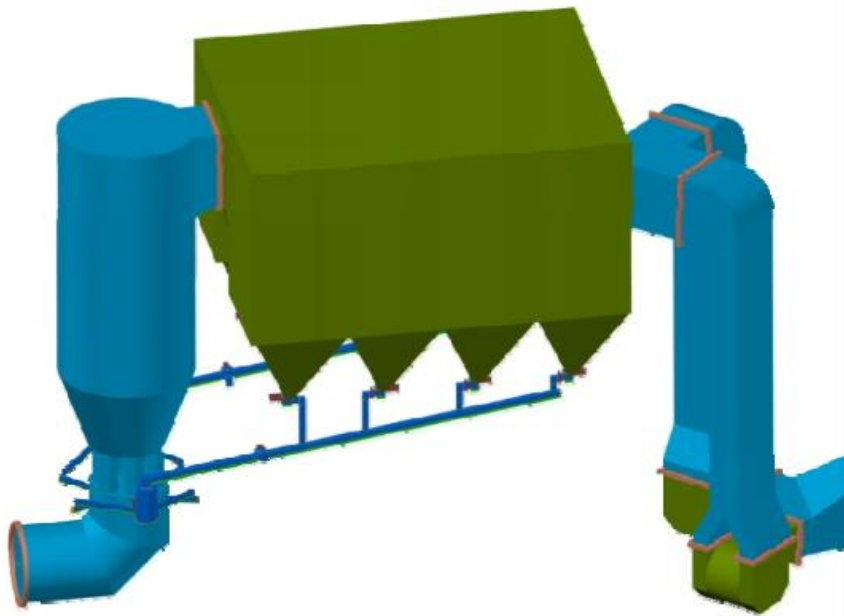
Circulating Dry Scrubber (CDS)



CDS – Component Systems



Fabric Filter for CDS Applications



- Based on FF experience in 6,000+ MW of SDA applications
- 10m PPS+ bags
- Lower ATC ratio
- Designed for reduced velocities in filtration zone
- Pulse air supply designed for high cleaning rate
- Larger hopper outlet opening
- Trough hopper design to minimize vertical height and accommodate high recirculation rate

SDA v. CDS

Parameter	SDA	CDS
Coal Sulfur	< 1.5% (typical)	< 4%
SO ₂ Removal Efficiency	90 – 95%	95 – 99 %
Experience	Large installed base	Smaller but growing
Recycle Ash	Limited by slurry % solids	Virtually unlimited
Fabric Filter	Industry standard	Larger due to high particulate loading
Operations and Maintenance	<ul style="list-style-type: none"> • Periodic Atomizer cleaning • Lime slaking system 	<ul style="list-style-type: none"> • No atomizer • Uses hydrated lime

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