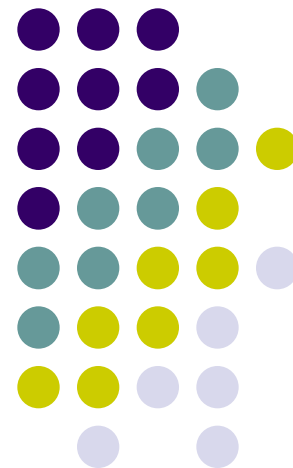


Coal Combustion Byproducts & Future Air Pollution Controls

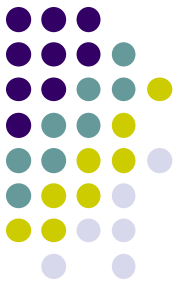
EEI Spring OSHA Conference
April 24, 2009

Jim Roewer
USWAG Executive Director



USWAG

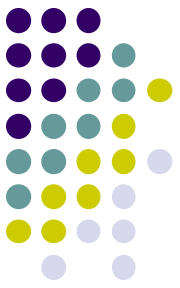
Impact on Evolving Technologies on CCPs



- How to address management & regulatory status of CCPs generated as a result of new air emission controls (*e.g.*, mercury removal) or new combustion technologies (*e.g.*, gasification)?
- USWAG Ash Management & Solid Waste Committee formed workgroup in 2006

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Impact on Evolving Technologies on CCPs



- Regulatory drivers leading to retrofit new air emission control technologies at power plants
- Many of these technologies impact existing CCPs and/or generate new CCPs
- Utility CCP managers and environmental staff may not have experience with these technologies

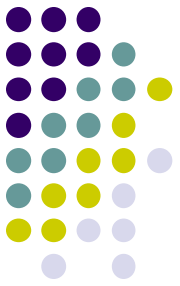
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Impact on Evolving Technologies on CCPs



- EPRI asked to provide technical information about the waste streams
 - EPRI report currently in preparation (Report No. 1014943)
- USWAG to analyze the probable regulatory status of each waste stream

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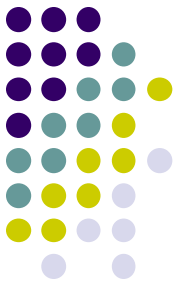


Report Outline

- Section 1 – Introduction
- Section 2 – High-volume CCPs
- Section 3 – NO_x control technology
- Section 4 – SO₃ control technology
- Section 5 – Mercury removal
- Section 6 – IGCC
- Section 7 – Solid wastes associated with collection, treatment, and handling of CCPs

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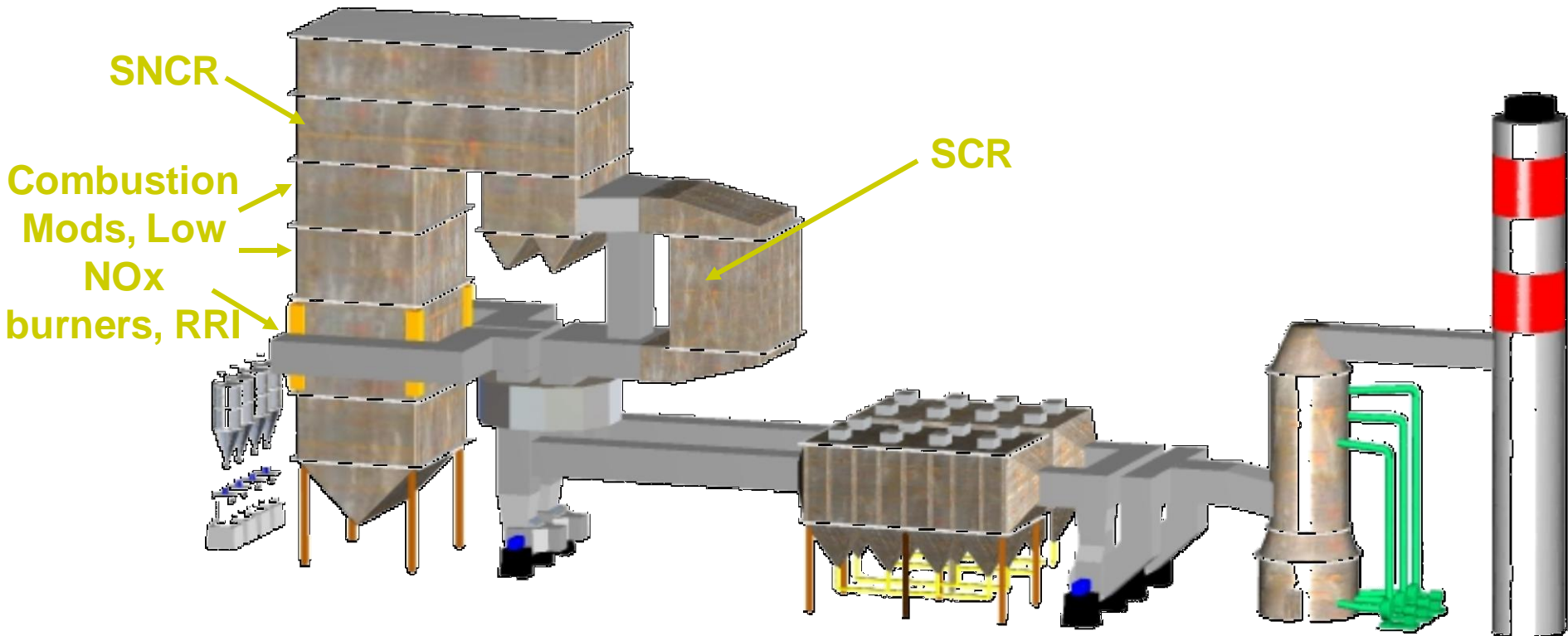
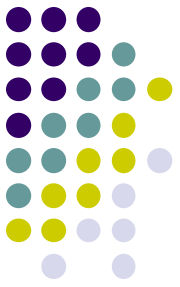
Impact on Evolving Technologies on CCPs



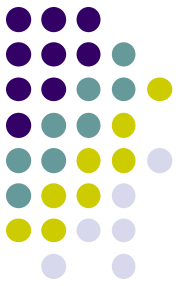
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Potential NO_x Control Options



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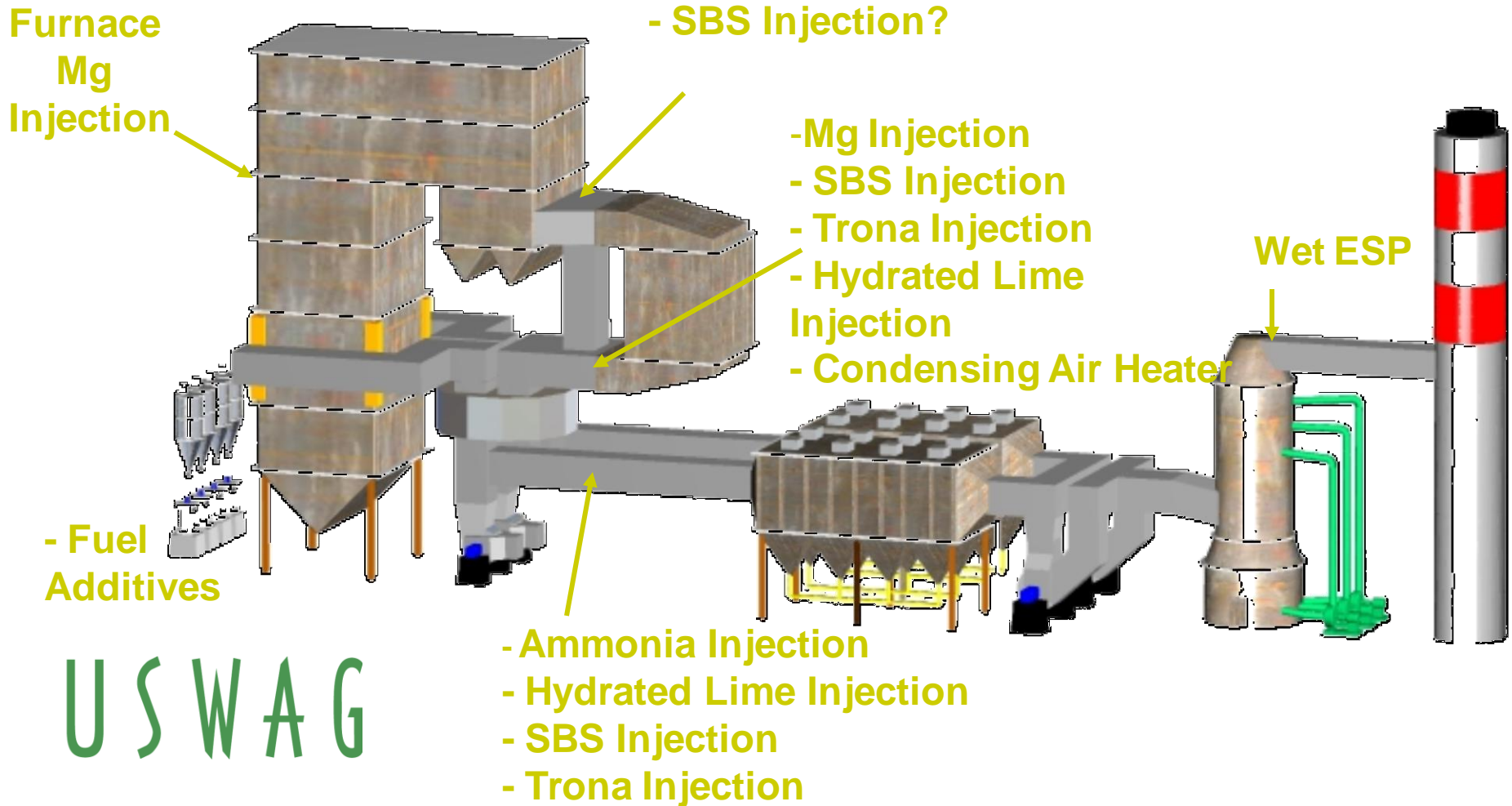
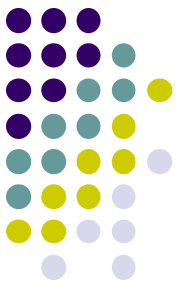


NOx Control

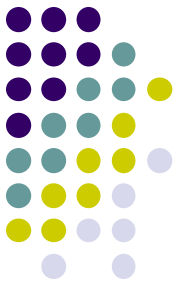
- Low NOx Burners
- SNCR - Ammonia or Urea Injection
- SCR - Ammonia in presence of catalyst (titanium oxide, vanadium oxide)

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Potential Sulfuric Acid Control Options



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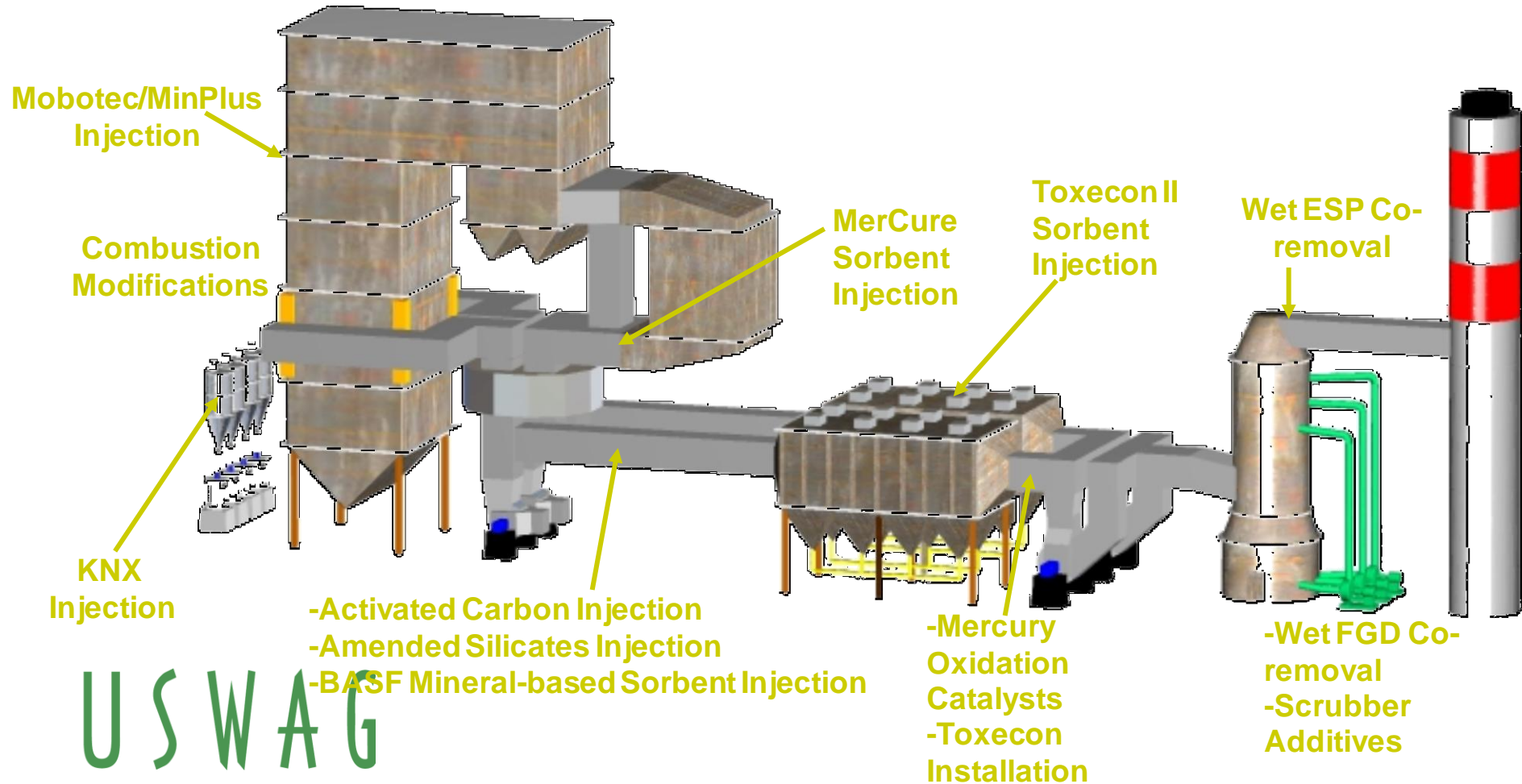
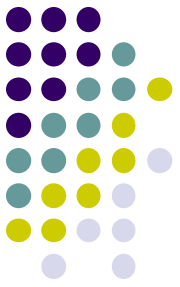


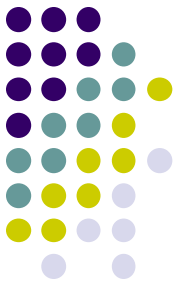
SOx Control

- Fuel Additives (propriety blends of magnesium oxide or magnesium hydroxide)
- Sodium Based Sorbents (sodium bisulfite, sodium sulfite, sodium carbonate)
- Ammonia Injection
- Hydrated Lime
- Trona (Hydrated Sodium Carbonate - Sodium Bicarbonate compound)

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Potential Mercury Control Options



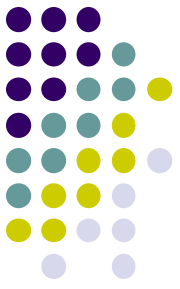


Hg Removal

- SCR (co-benefit)
- Baghouse (co-benefit)
- Sorbent injection
- Toxecon

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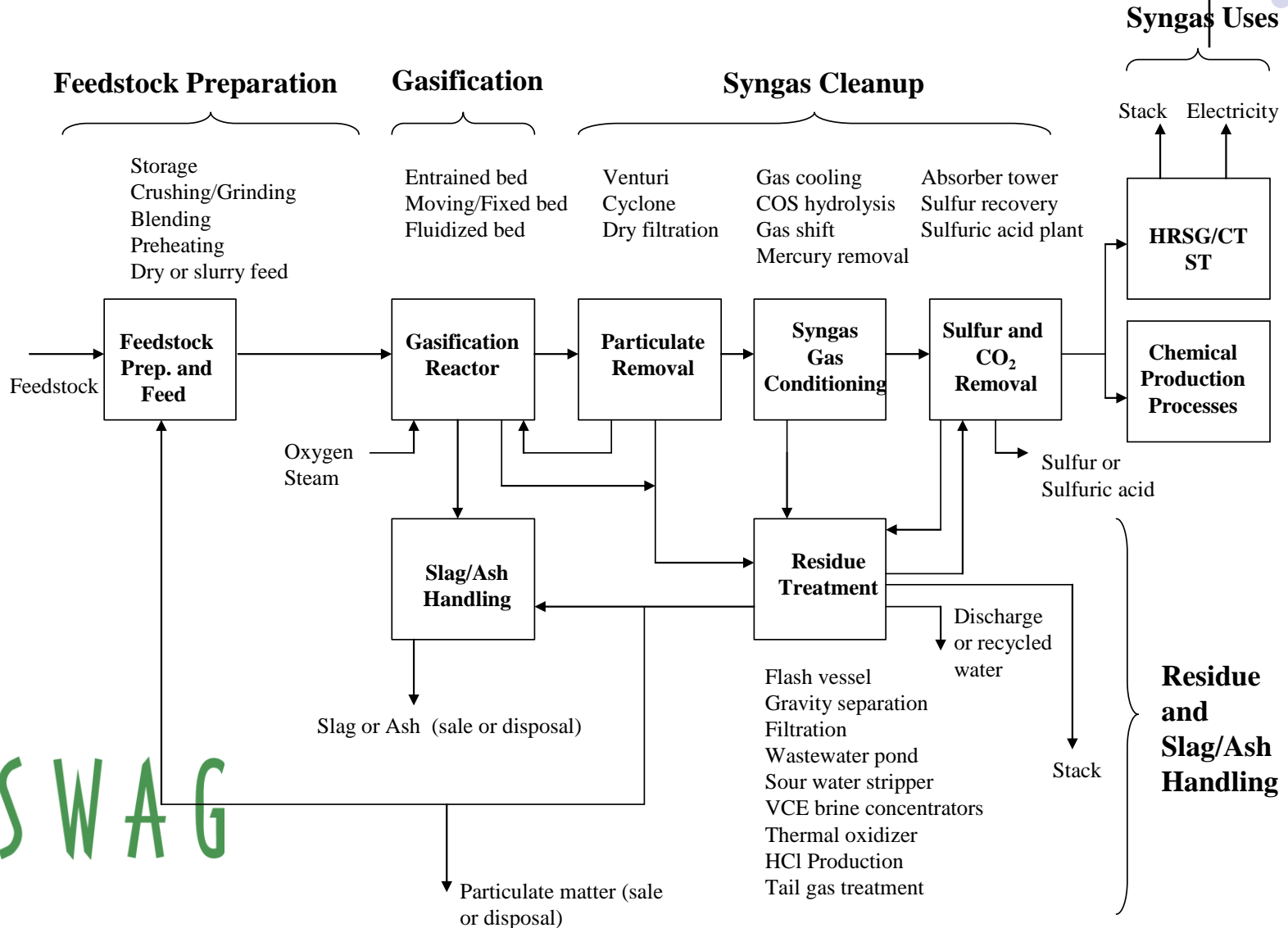
Hg Removal - Scrubber Enhancement



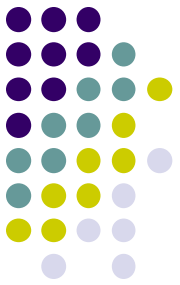
- Low temperature oxidation catalysts
- Sorbent injection
- Halogen injection (solid/solution addition to coal)
- Additives to control re-emissions (e.g., Sodium hydrosulfide)

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Overview of IGCC Process



Questions?



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