

Co-firing Biomass

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- What is Co-firing
- Why co-fire?
- Challenges with co-firing



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What is Co-firing?

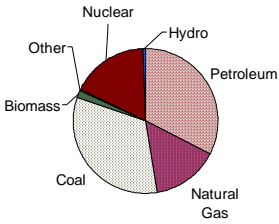
- Burning more than one type of fuel in a combustion unit
- Our interest is in co-firing biomass with coal in commercial or industrial plants
 - Power generation plants
 - Industrial heat plants
 - Large buildings



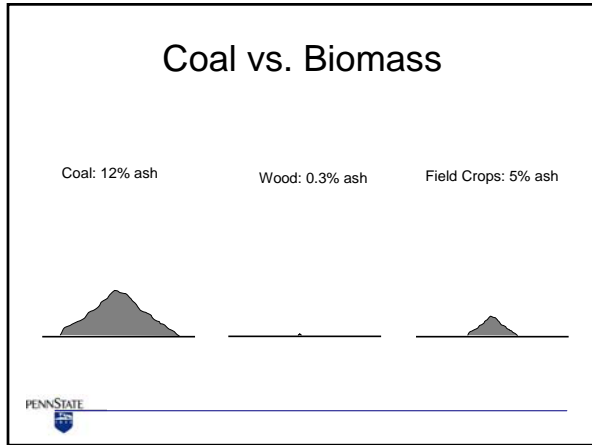
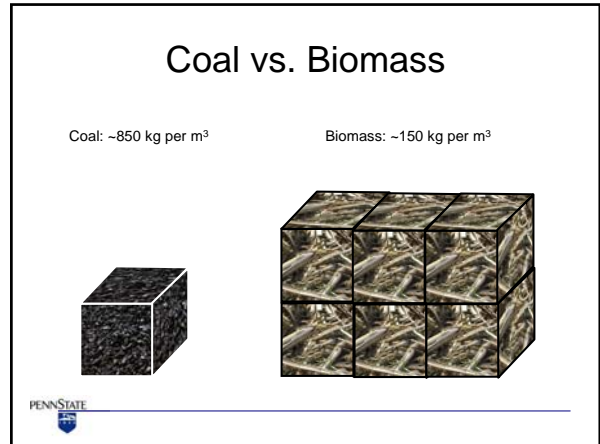
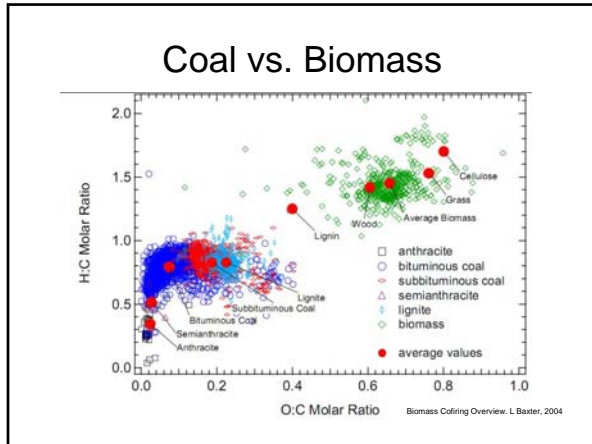
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The Market for Co-firing is HUGE

- 57 million tons coal/year in PA
- 5% cofiring would require 4.4 million tons of biomass per year
- A single 1000 MW plant at 5% cofiring would require biomass from ~50,000 high yield acres



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“Biochar” (a.k.a. charcoal)

- Makes biomass perform more like coal
- Adds cost to biomass

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Why Co-fire?

<p><u>For the Grower</u></p> <ul style="list-style-type: none"> • Large potential customer • Steady need • Potential for long-term contracts 	<p><u>For the Plant Owner</u></p> <ul style="list-style-type: none"> • Pollution Reduction <ul style="list-style-type: none"> – SO₂ – Mercury – NOx? – CO₂ – Government Regulations
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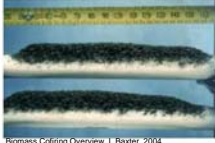
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Challenges with Co-firing

- Users tend to prefer a steady, year-round supply of uniform-quality fuel
--- BUT ---
- Biomass tends to be available on a seasonal basis, with quality that varies from month to month

Challenges with Co-firing

- Biomass does not combust exactly the same as coal
 - Slagging and Fouling



Biomass Co-firing Overview, L. Baxter, 2004



Generally not a problem when co-firing at low percentages



Challenges with Co-firing

- Fuel Delivery / Handling



Examples of Co-firing

- Over 150 test runs at various locations

Low percentage (~5%) biomass co-firing has proven itself to be a reliable and practical method for using biomass and reducing plant emissions



Take home message

- Co-firing at low percentages (~5%) can be an excellent market for biomass crops
- Co-firing at low percentages (~5%) is a proven method for improving emissions at coal-fired plants

