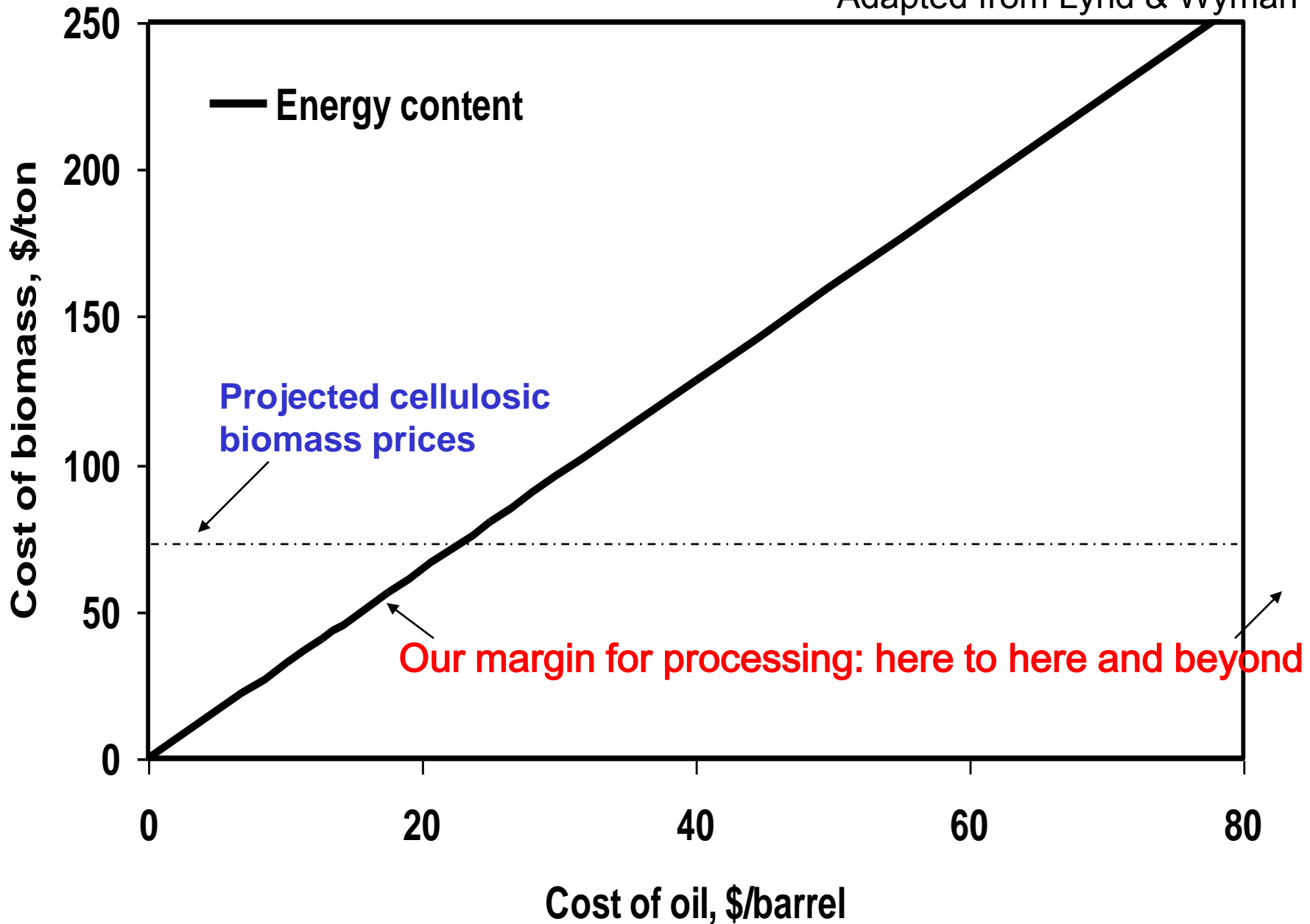


# Renewable Energy: Big Questions, Big Opportunities for Agriculture & the Land Grants

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**ESS/SAES/ARD Meeting and Workshop**  
**September 14-16, 2009**  
**Oklahoma City, Oklahoma**



*Biomass is the cheapest carbon, especially in a carbon-constrained world*

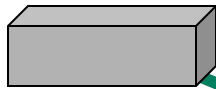
# Questions for a Biofuels Future

- Premise: *the biofuels industry will continue to grow rapidly in coming years.*
- Some resulting questions:
  - How will supply chains develop?—**big** issue
  - How will society/interest groups, etc. react?
  - How will related environmental issues (carbon sequestration, water, soil quality, landscape values, biodiversity, etc.) be addressed?
  - Given a large biofuel demand, what will the implications be for food/feed/fiber markets?
  - Can we coproduce fuels (& foods/feeds)?
  - How can farmers & local communities benefit?
  - Will the agricultural research system rise to its huge opportunity?

# Biofuels: Changing Balance between Processing and Feedstock

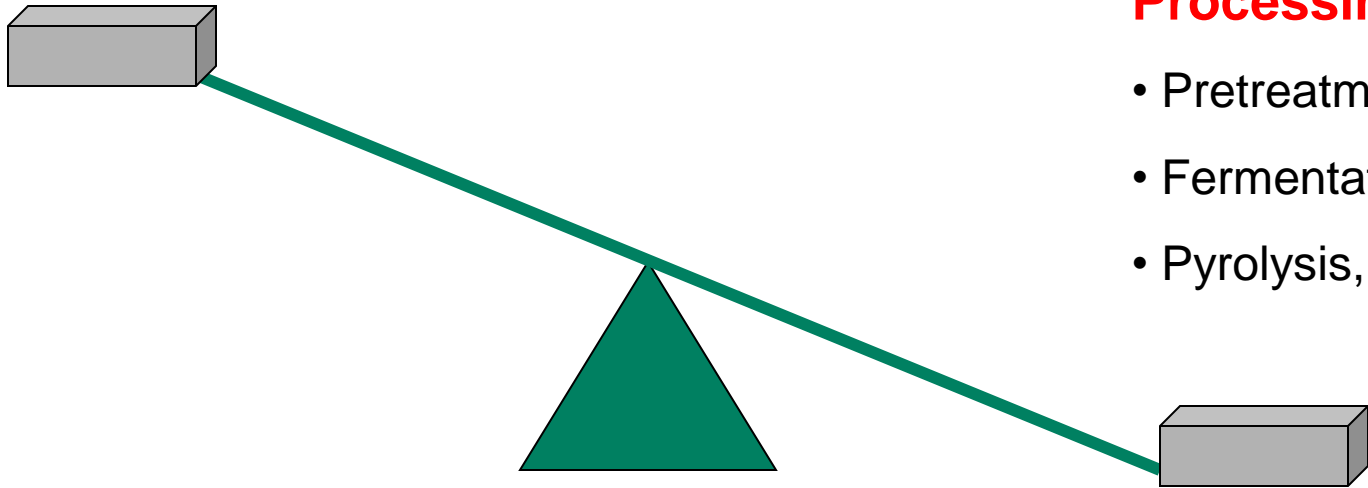
Today

**Feedstock**



**Processing**

- Pretreatment
- Fermentation
- Pyrolysis, etc.



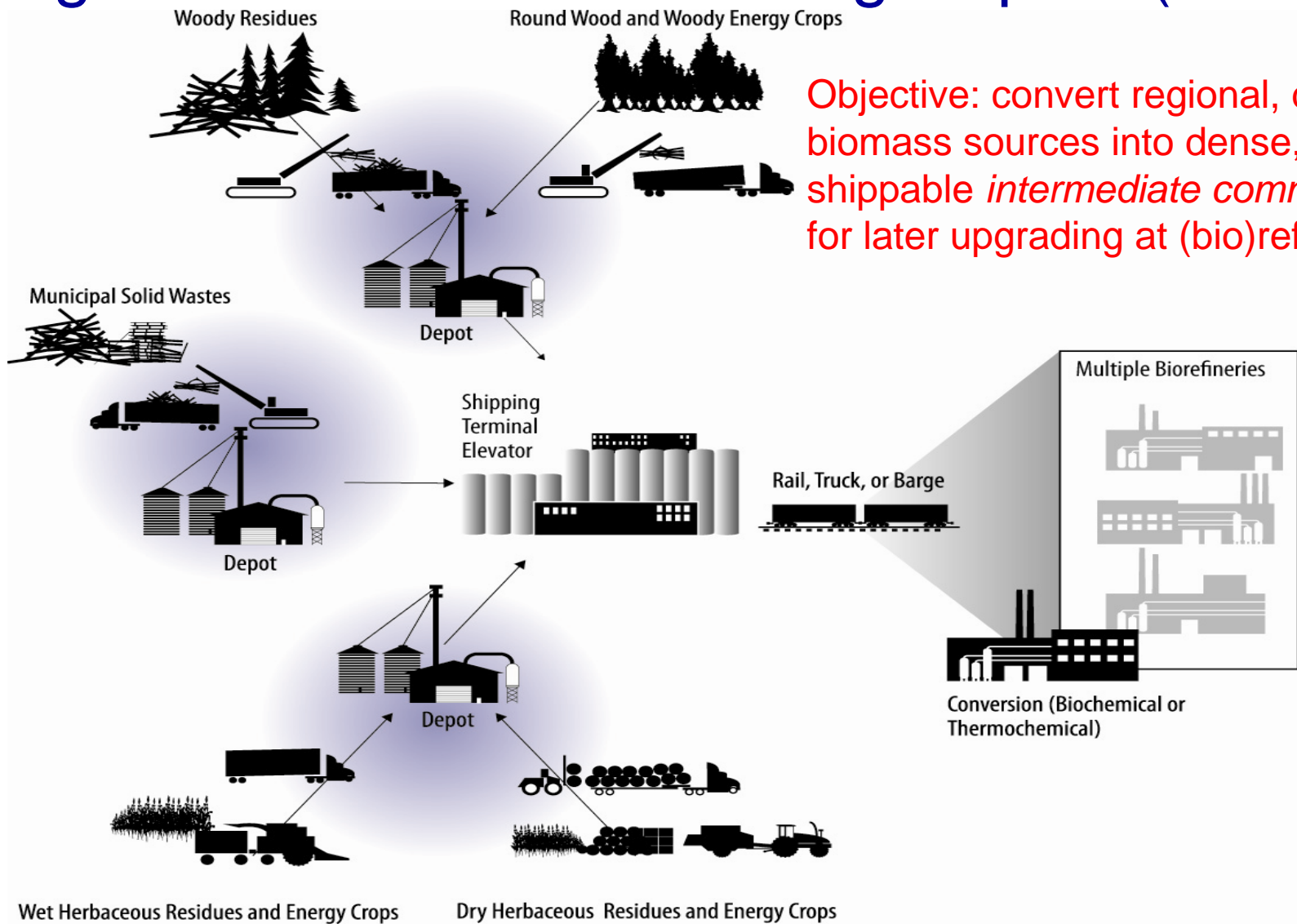
# Changing Balance between Processing & Feedstock: *Opportunities for Research*

Near Future



# Attacking Biomass Supply Challenges: Regional Biomass Processing Depots (RPBDs)

Objective: convert regional, distinct biomass sources into dense, stable, shippable *intermediate commodities* for later upgrading at (bio)refineries



# Advantages and R&D Needs for Regional Biomass Processing Depots

- Advantages of RBPDs
  - Address biomass variability near point of production
  - Produce dense, stable, shippable *intermediate commodities* for biofuel producers (“biorefineries”)
  - Reduce transaction costs & capital risks for biorefineries
  - Benefit rural communities through job creation & ownership
  - Address “food vs. fuel” and sustainability issues directly
- Research needs to implement RBPDs
  - Optimize in field harvest/storage/logistical systems
  - Optimize supply chain for “best” intermediate products
  - Conduct techno-economic and life cycle studies
  - Develop processing technology/property data for biofuel *intermediates* & coproducts (eg, biochar, animal feeds)