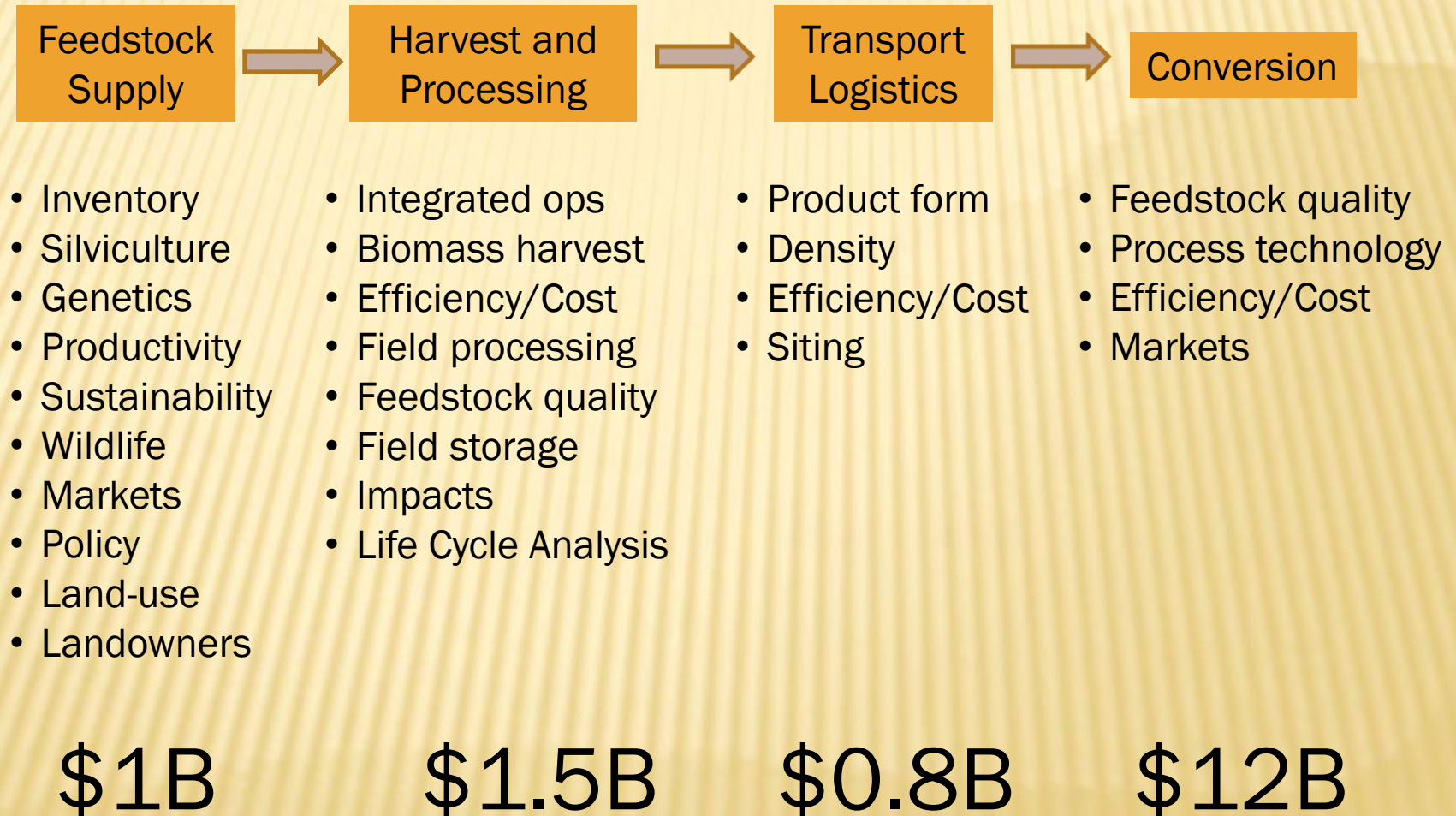


Bob Rummer, USDA Forest Service, Forest Operations Research

# **FOREST BIOMASS LOGISTICS: CHALLENGES AND RESEARCH ISSUES**

# THE BIOMASS SUPPLY CHAIN





# SOUTHERN FOREST FUTURES

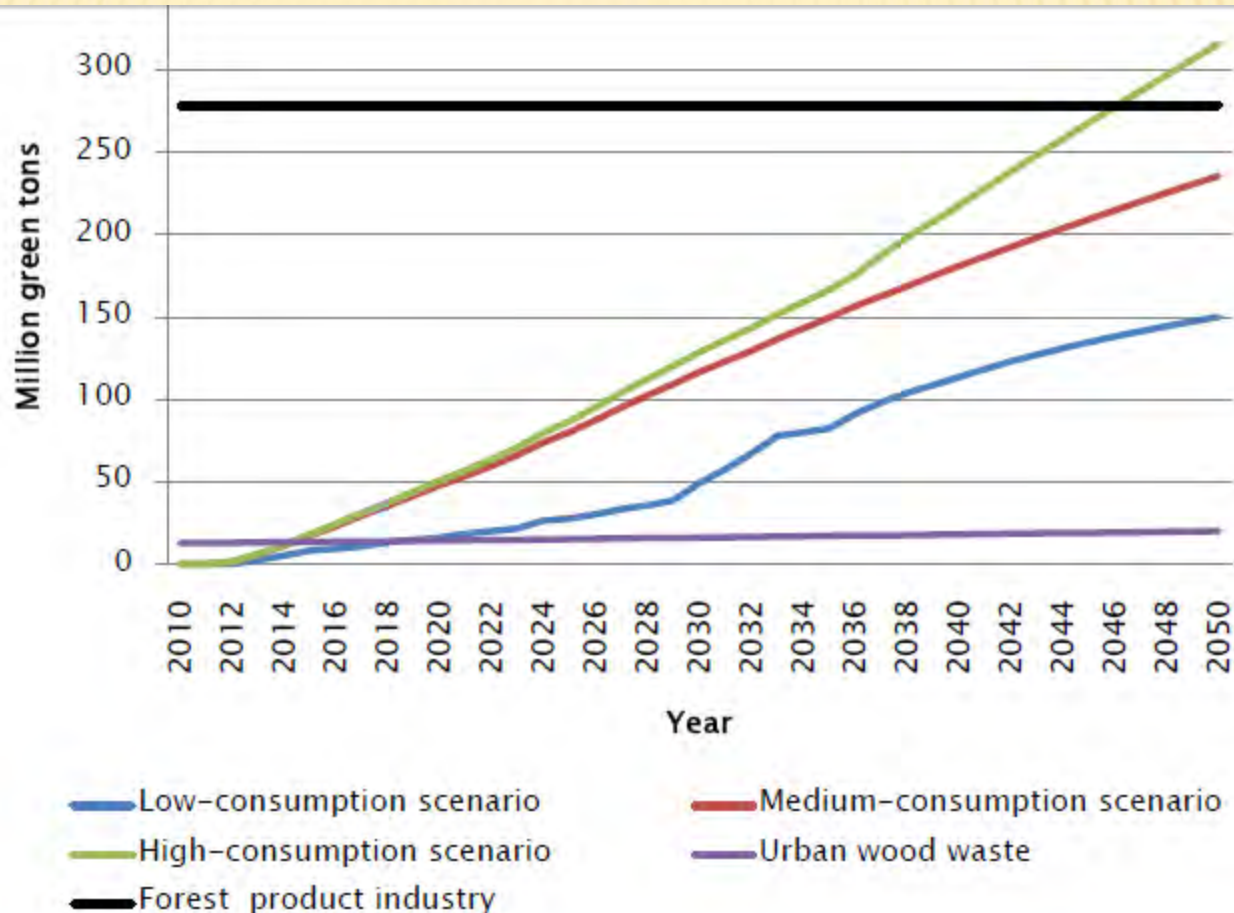


Figure 37— Woody biomass demand for energy in the South under low-, medium-, and high-consumption scenarios; with demand from traditional forest industry and availability from urban wood waste, 2010 to 2050.

# BIOMASS HARVESTING





# LOGGING RESIDUES





# UNDERSTORY HARVESTING





# FUELWOOD CHIPPING





# HIGH PRODUCTION HARVESTING





# SHORT ROTATION HARDWOODS





# WOODY BIOMASS LOGISTICS

- ✗ Feedstock specific, no universal system
- ✗ Cost-limited, no pot o' gold for anybody
- ✗ Forests have other social values and competing uses
- ✗ Scale of industry is critical—
  - + 9500 trucks/truckers?
  - + 1500 logging contractors?

[www.srs.fs.usda.gov/futures](http://www.srs.fs.usda.gov/futures)



# WOODY BIOMASS RESEARCH ISSUES

- ✗ What types of forests will provide supply?
- ✗ What kind of systems will be used?
- ✗ What are the feedstock quality specs?
- ✗ What is the impact of removal on forests?
- ✗ Lots of room for innovation—5% savings in harvest costs is worth \$150M/yr