U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

BIOENERGY TECHNOLOGIES OFFICE

OAK RIDGE NATIONAL LABORATORY

MANAGED BY UT-BATTELLE FOR THE DEPARTMENT OF ENERGY

Bioenergy Innovations Developed by Oak Ridge National Laboratory

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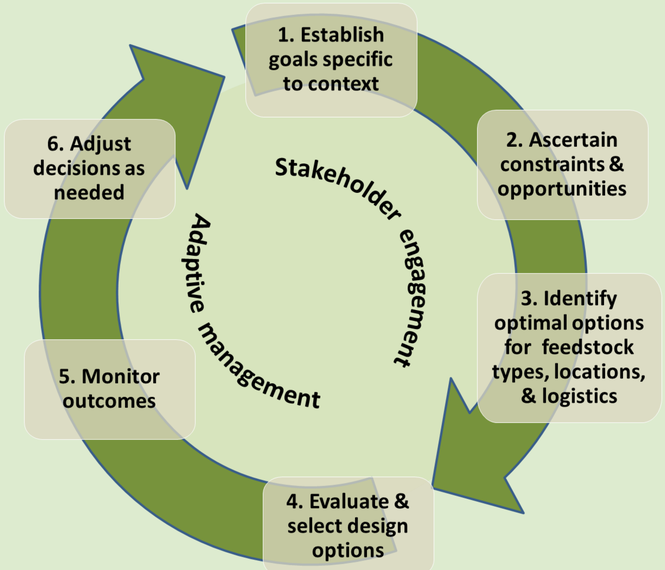
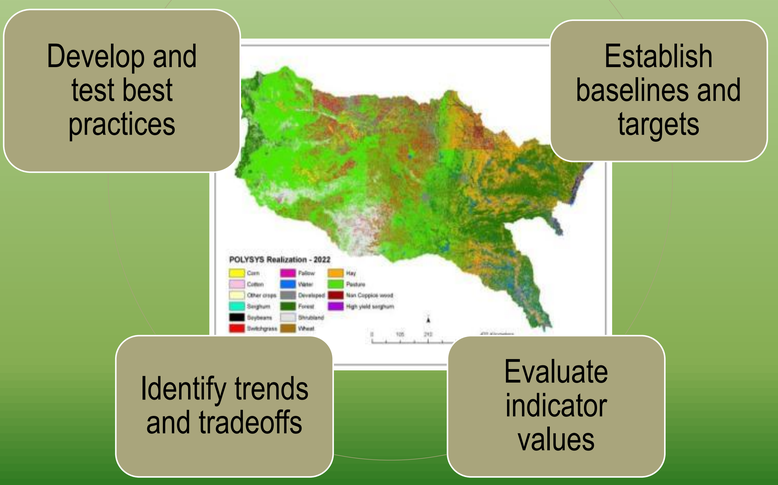
CBES Center for BioEnergy Sustainability

http://www.ornl.gov/sci/ees/cbes/

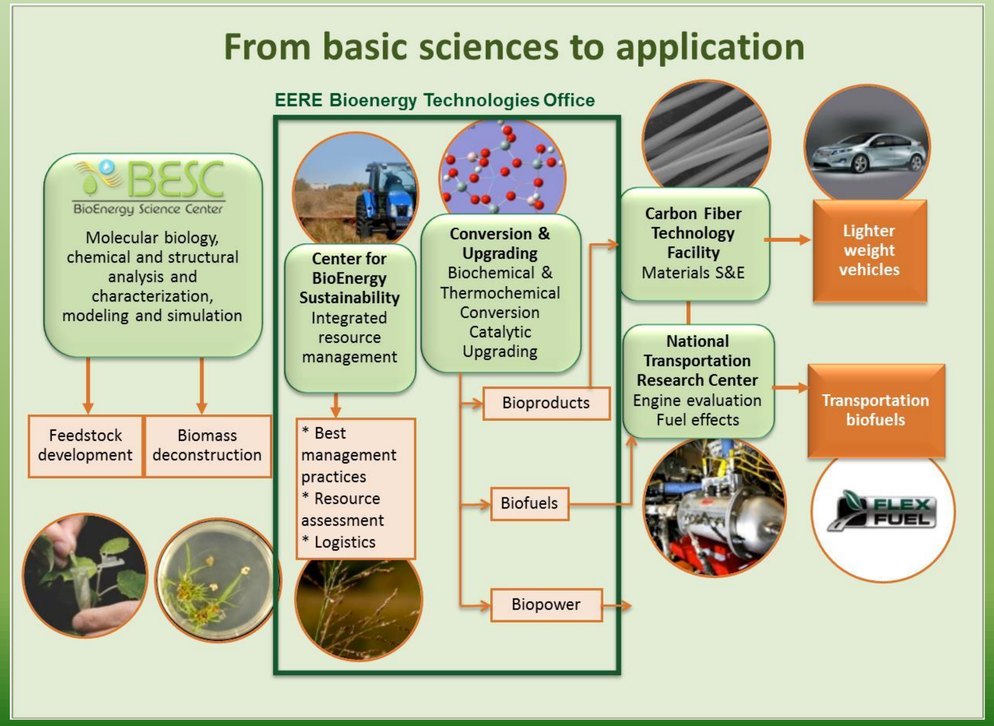
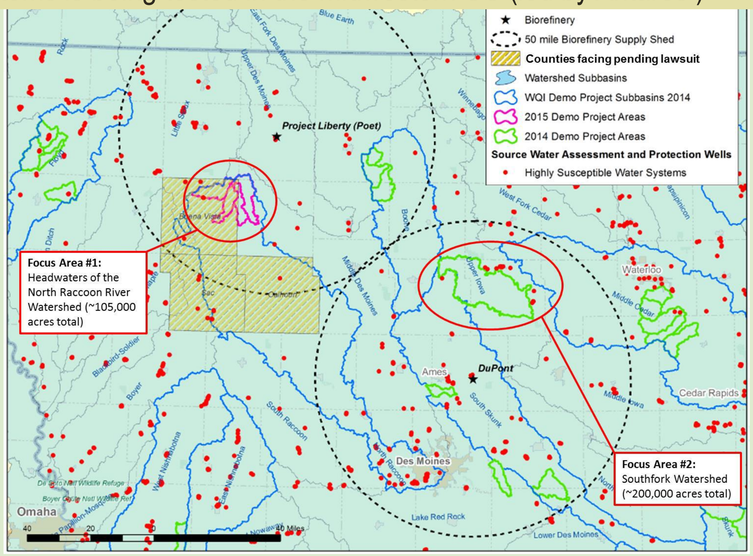
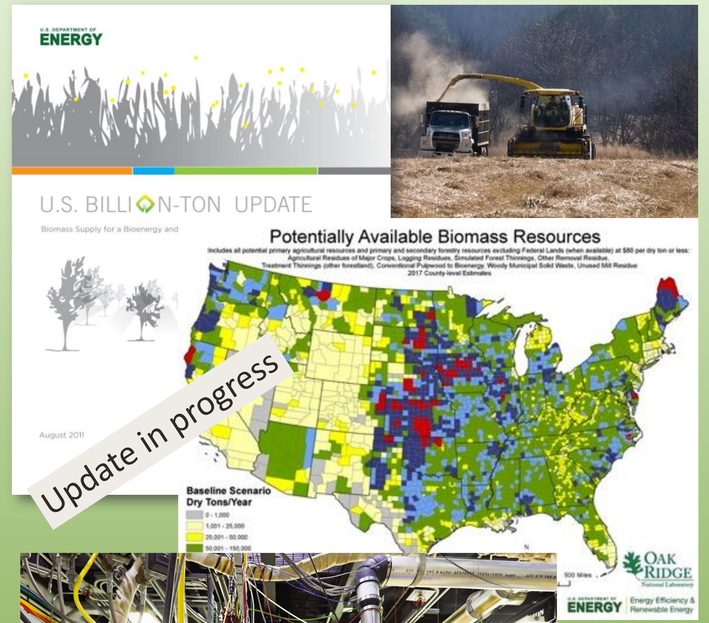
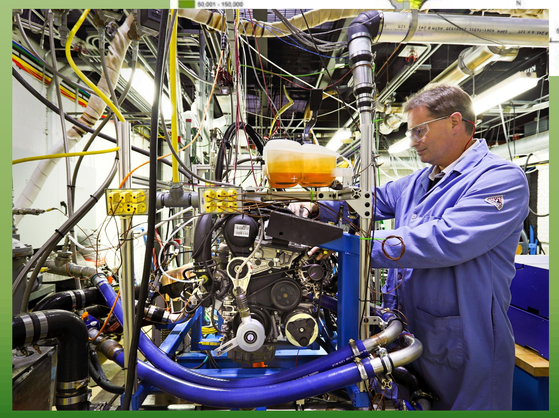
Steps in landscape design (Dale, Kline, Buford, Volk, Smith, Stupak. 2016. Renewable & Sustainable Energy Reviews 56:1158-1171)





Landscape design for assessing progress toward sustainable bioeconomy is supported by innovative technologies being developed at ORNL:

- Analysis tools such as
  - ✓ Multimetric optimization
  - ✓ Economic models / Ecosystem services
  - ✓ Stakeholder engagement
  - ✓ Quantitative assessment of feedstock supply (e.g., the Billion-Ton study)
- Effects on water, soil, and productivity estimated by field studies and models
- An indicator approach to assess progress
- Visualization of feedstock supply
- Adaptive management for multiple objectives (e.g., water-smart energy)
- Feedstock logistics
- Biofuel engine and vehicle evaluations
- Lignin-based bioproducts



Landscape design approach for assessing sustainable bioenergy systems is being tested in the midwestern US (led by Antares)