Biomass & Bioenergy Flows

Biomass

Fiber

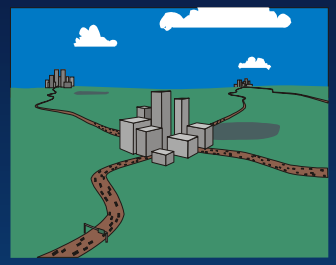
pulp
paper
lumber
plywood
cotton

Materials

Process Residues
black liquor
sawdust
bark

Crops, Animals

Food



Consumers

MSW clean fraction
yard trimmings
constr. & demolition
wood
non-recyclable
organics

Process Residues
dung
bagasse

stalks & straws
harvest residues
forest slash
forest harvest for energy
plantations

Bioenergy

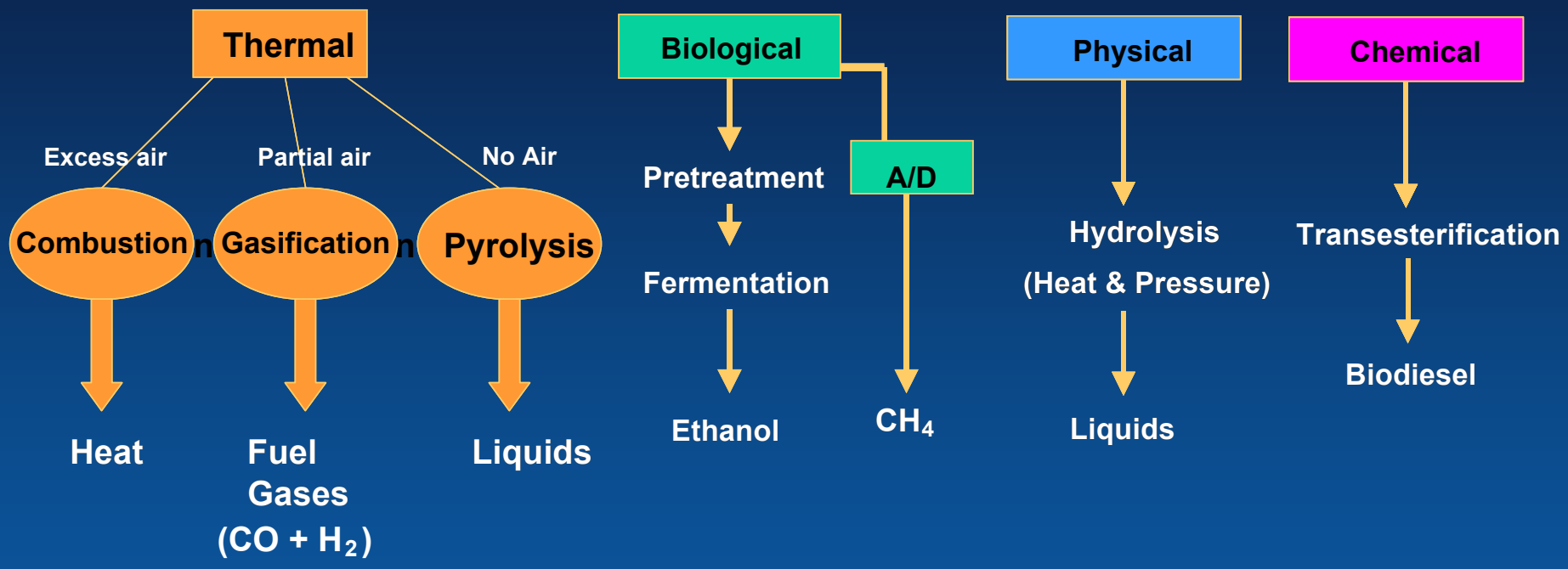
Energy Services

heat
CHP
electricity

Biofuels

charcoal
biogas
ethanol

Biomass Energy Pathways

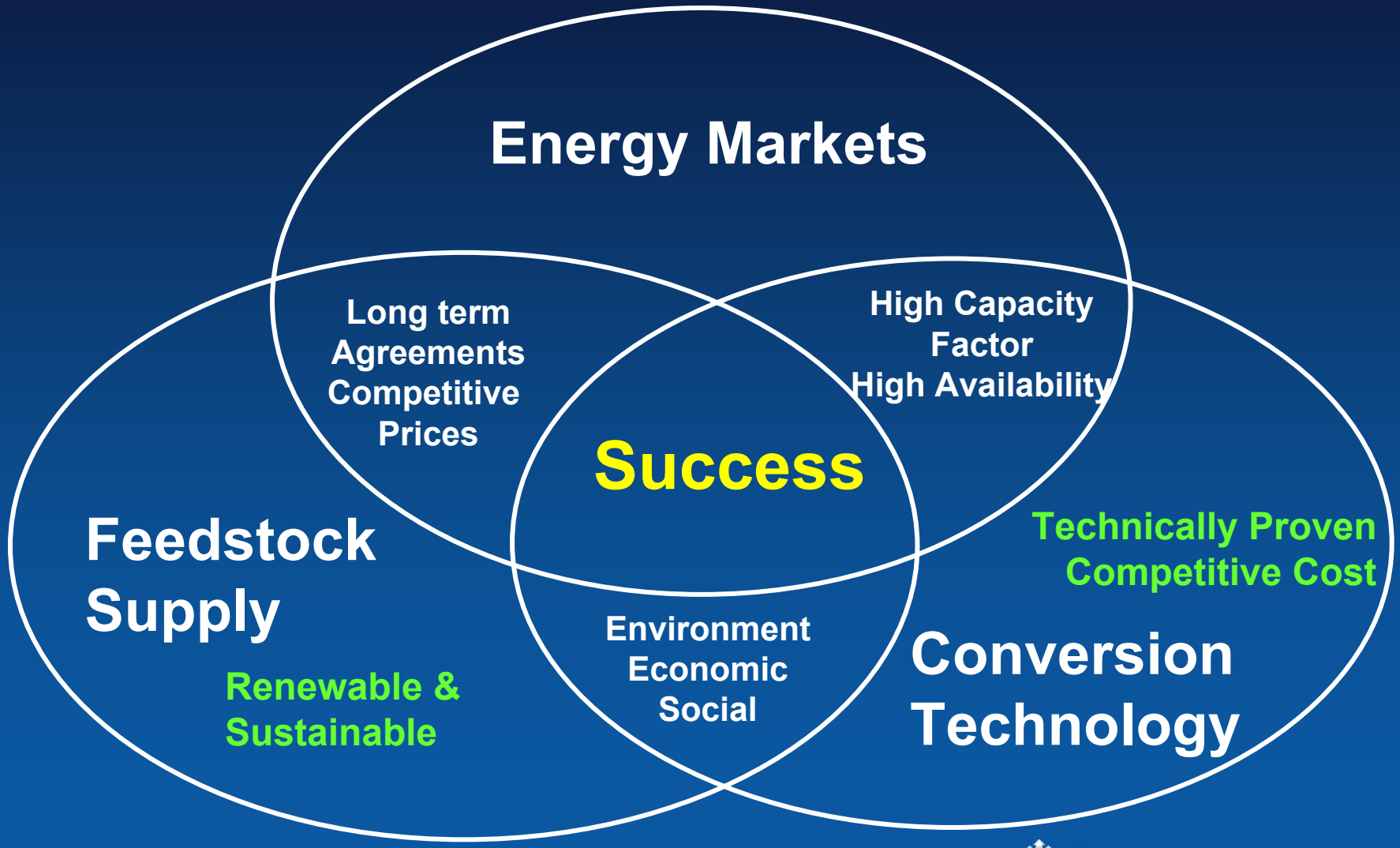


Wood Stove Heating

Seasoned firewood (20% moisture) @ $100/cord (~$50/ton)

~20 MBTU/cord → high efficiency wood stove @ 77% efficiency

= $6.50/MBTU delivered to home

Comparable to current cost of Natural Gas

Bioenergy Criteria for Success