

# ***New Zealand Lignocellulosic Bioethanol Initiative***



**AGRONOMICS  
BIOMASS  
COLLECTION**



**PRETREATMENT**



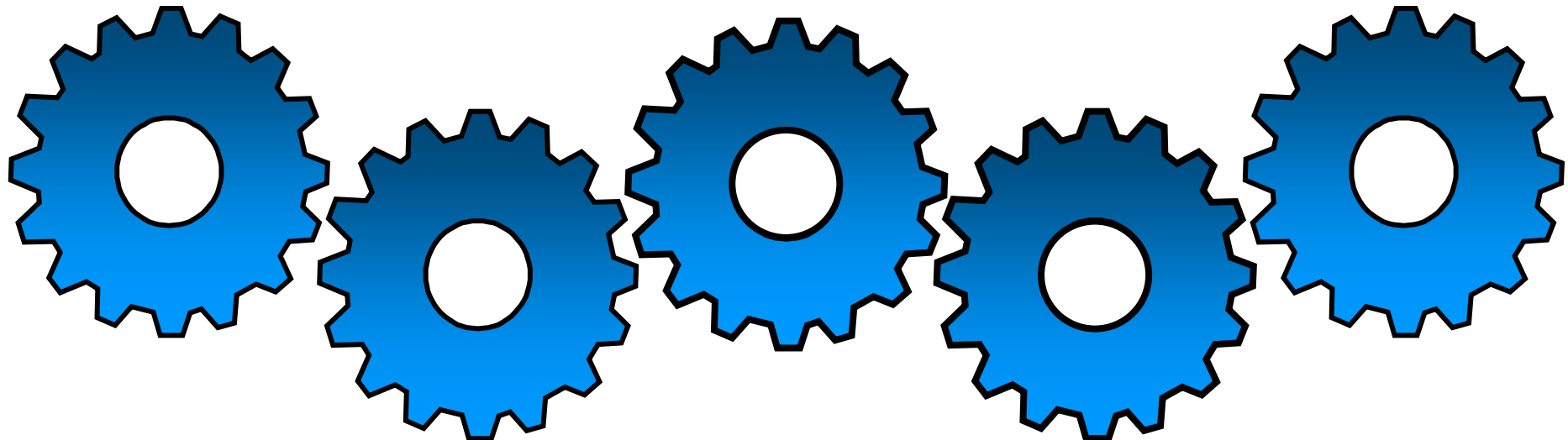
**ENZYMATIC  
SACCHARIFICATION**



**FERMENTATION**



**PROCESS  
ENGINEERING**



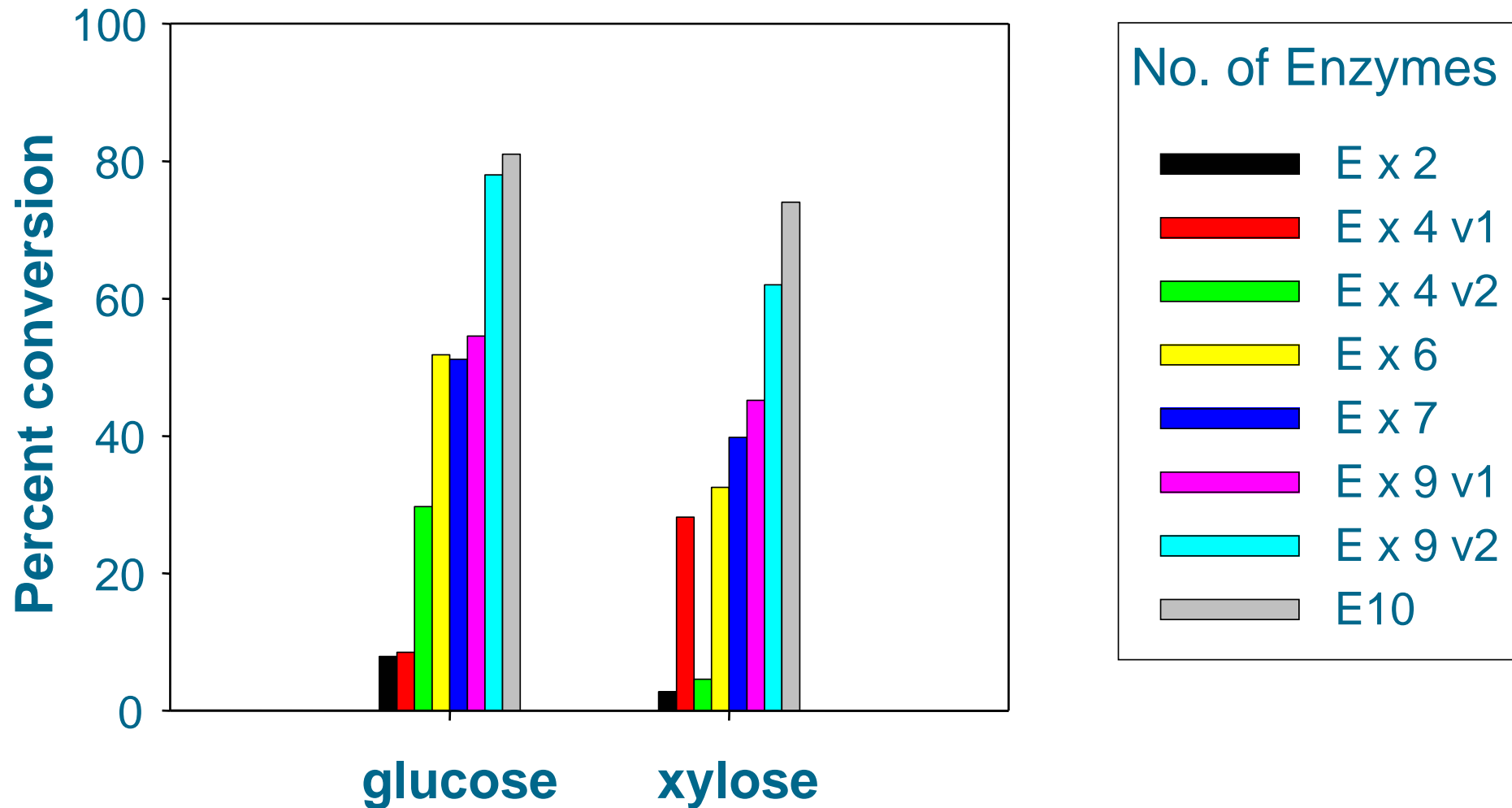
Plant	% lignin	% cellulose	% hemi-cellulose	L/ODT (cellulose)	L/ODT (hemicellulose)	Total
Hardwood (Eucalyptus)	20	45	30	270	179	448
Softwood ( <i>Pinus radiata</i> )	28	42	27	249	161	410
Corn stover	18	35	22	210	140	350
Switch grass	18	31	24	186	144	329
Wheat straw	17	33	23	196	140	336
Rice straw	10	39	15	231	91	322
Sugarcane bagasse	24	43	25	256	151	406

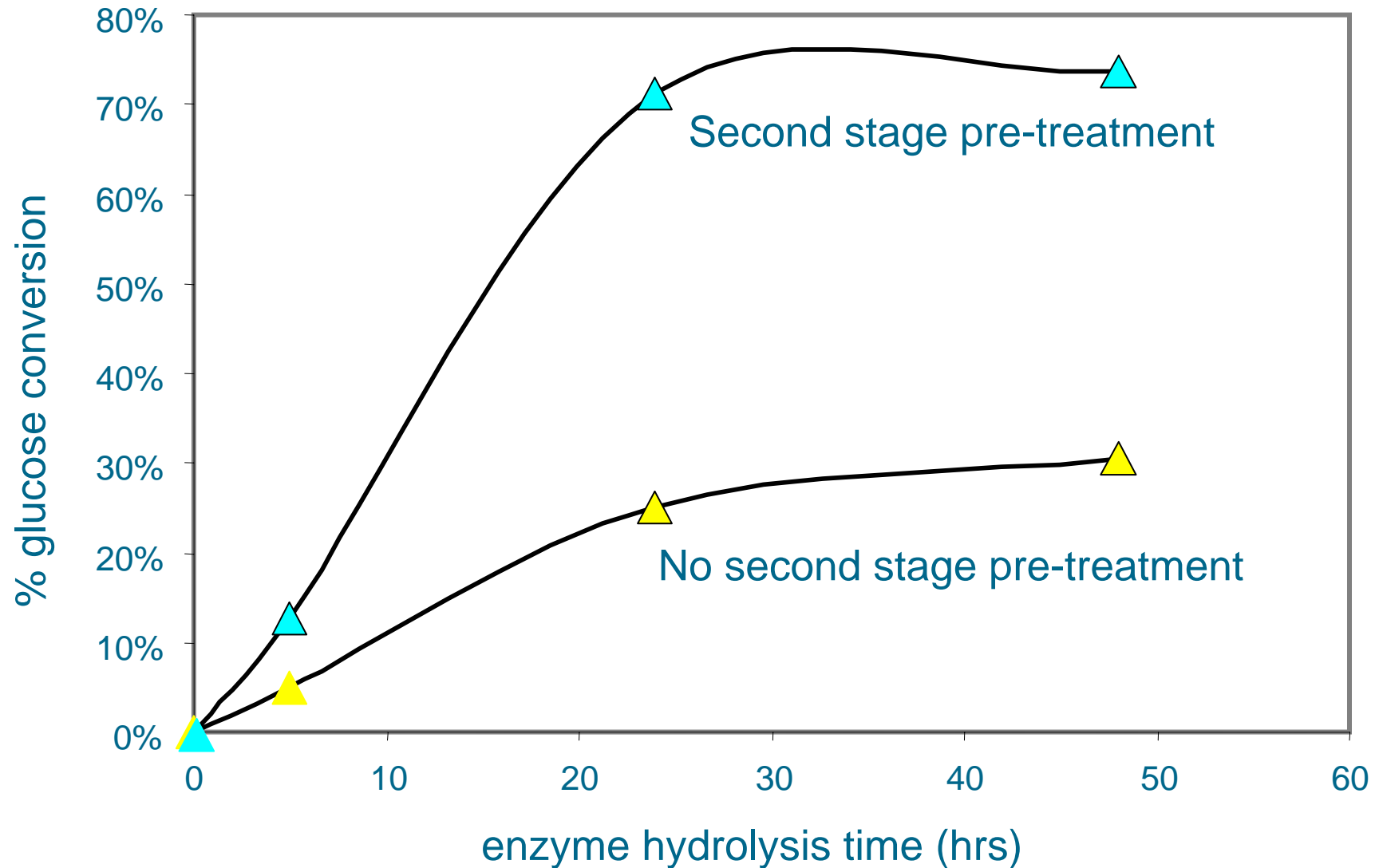
## **Scoping Study:**

- Performance of enzyme cocktails
  - Efficacy on New Zealand wood pulps
  - Pre-treatment variables

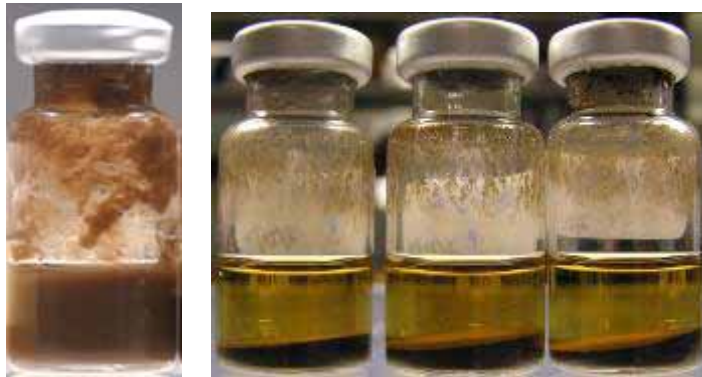
## **Feasibility Study:**

- Economic and engineering models
  - Pretreatment and conversion options
  - Feedstock availability
  - Supply chain logistics
- Commercial engagement
- Technology development programme

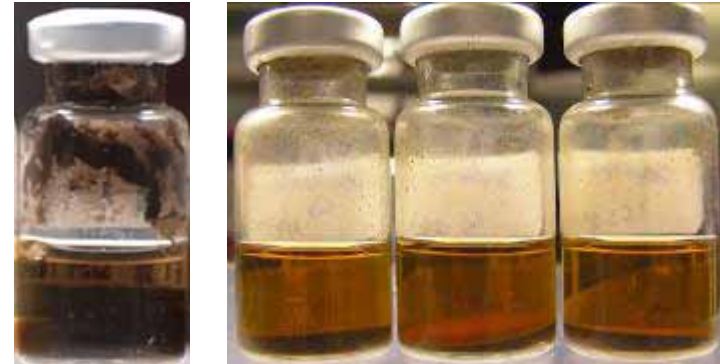




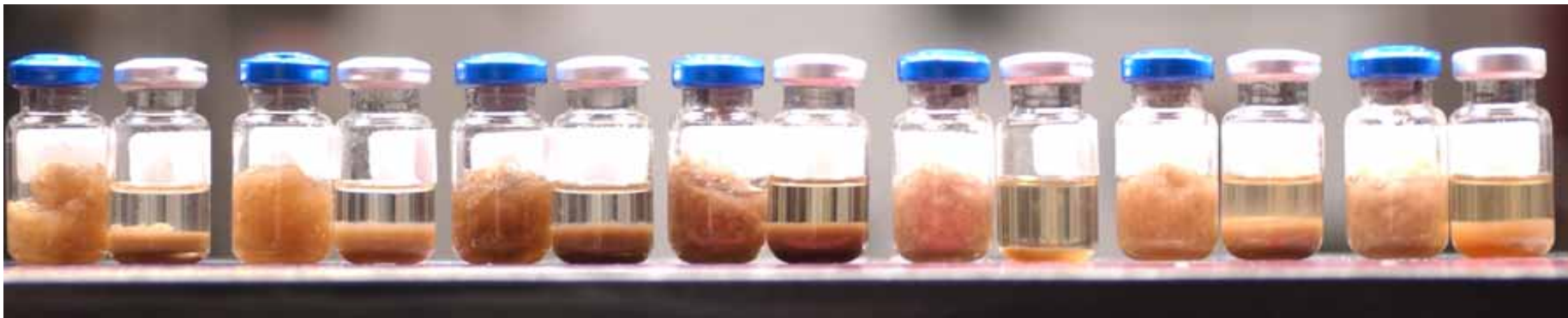
## CORN STOVER

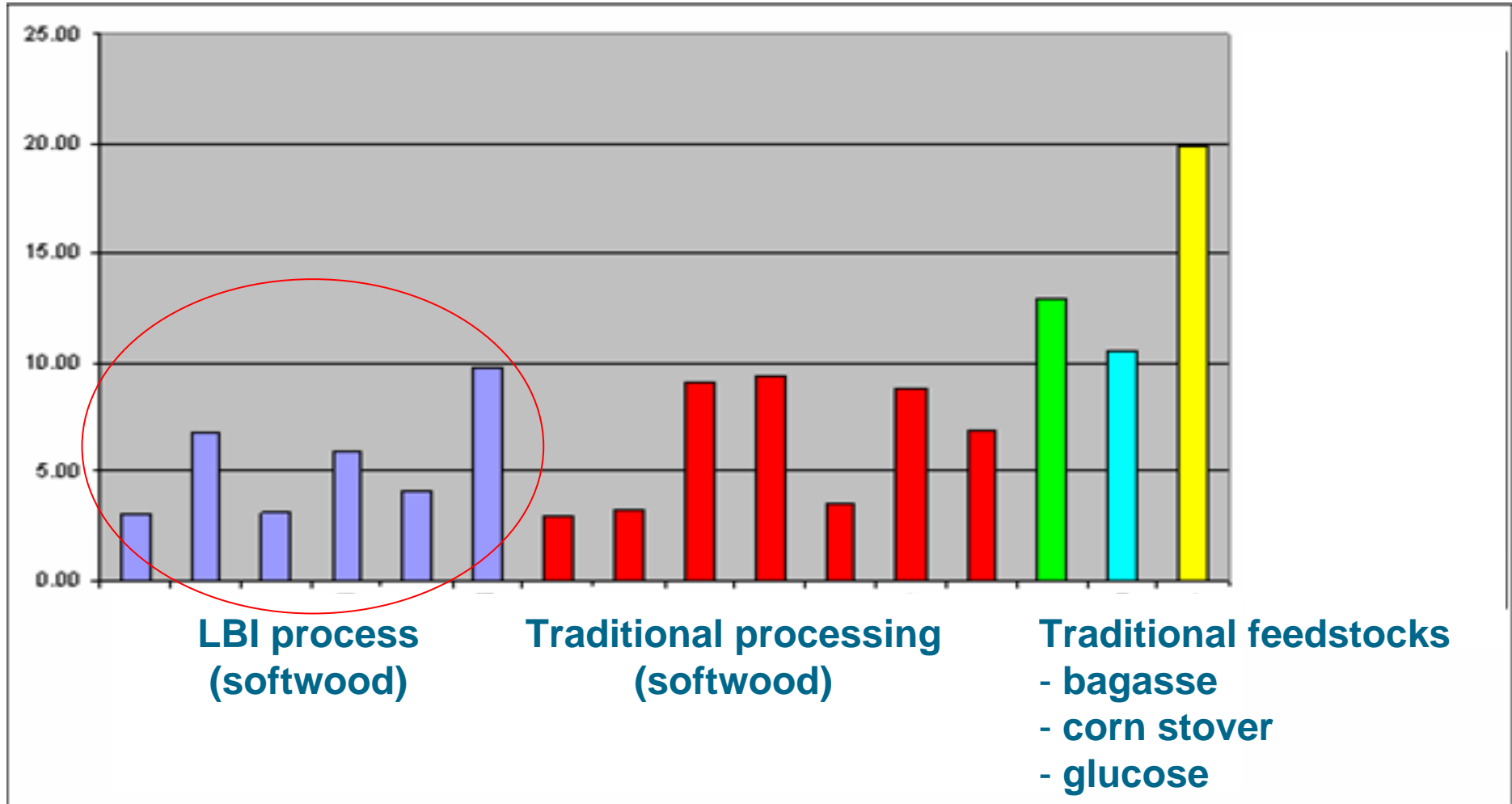


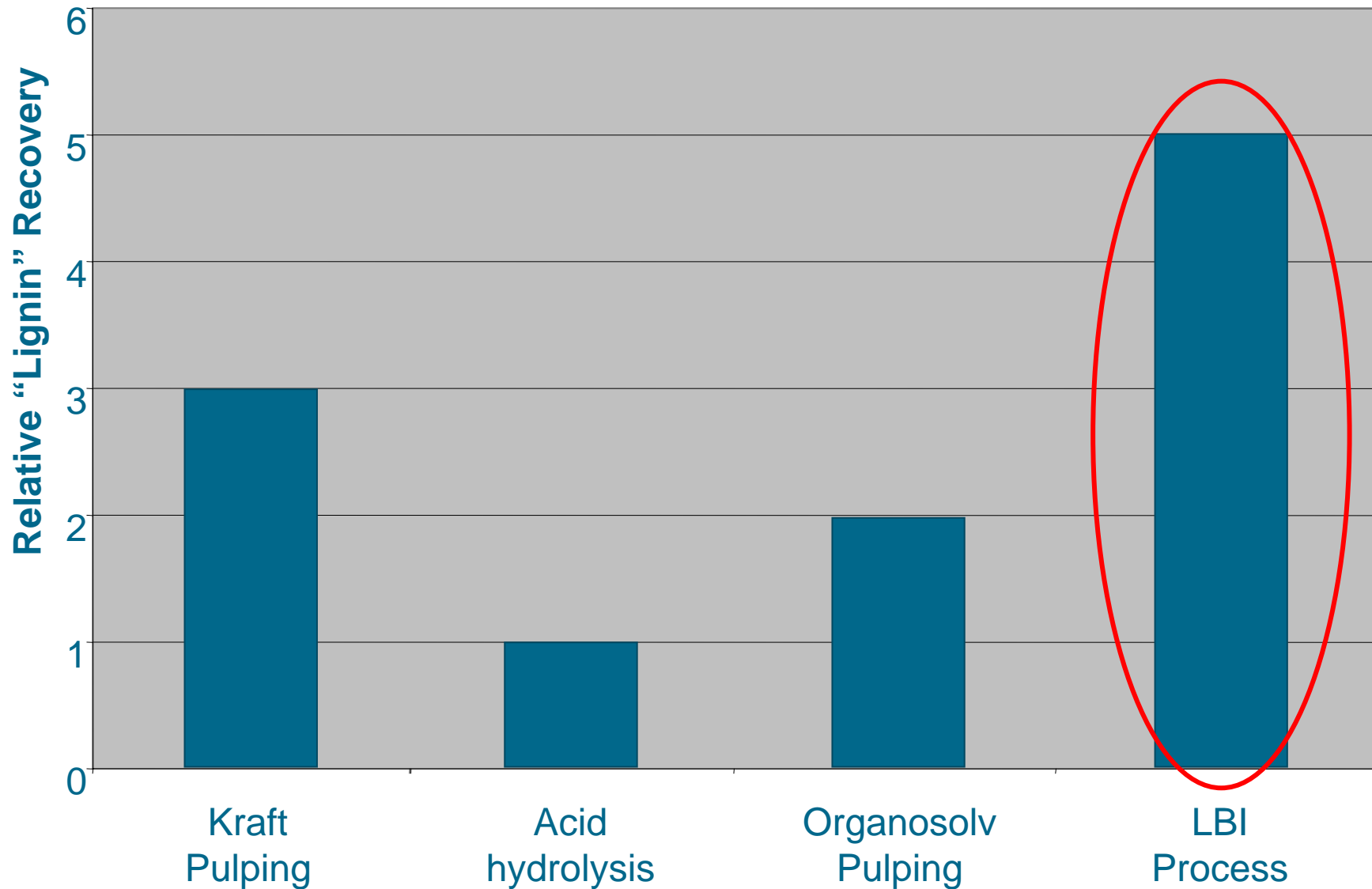
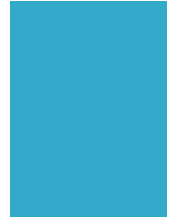
## POPLAR



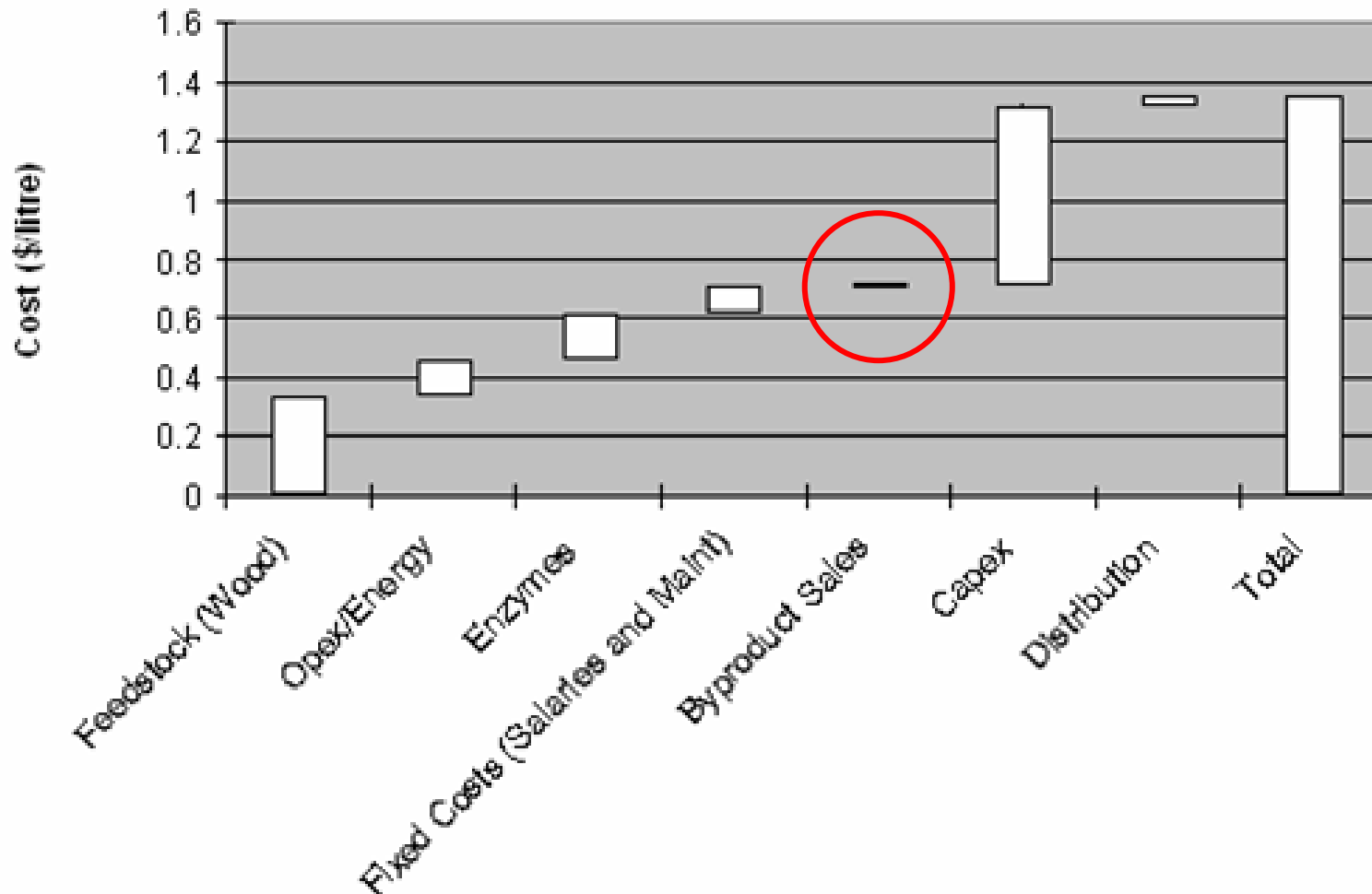
## PINUS RADIATA







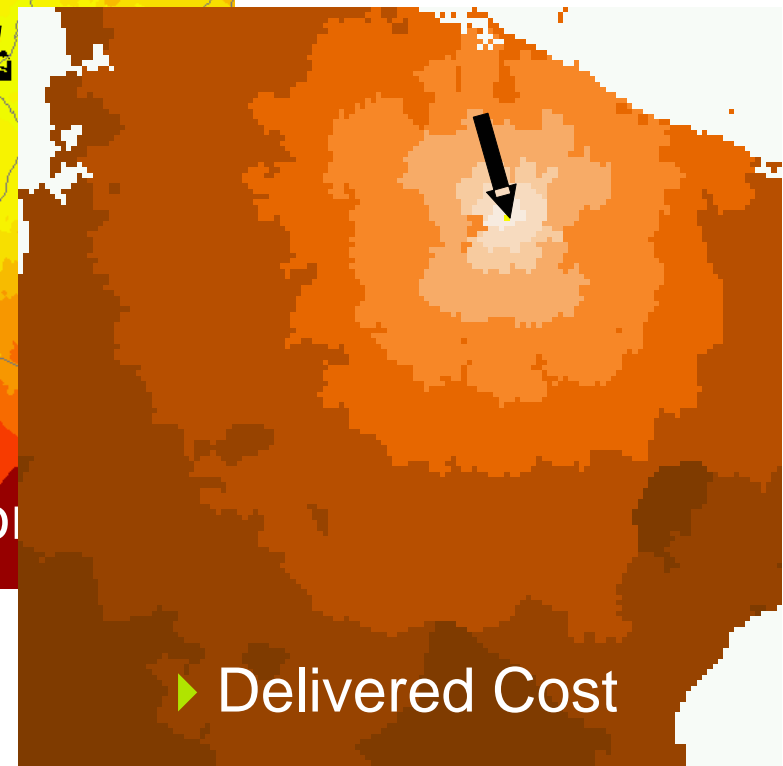
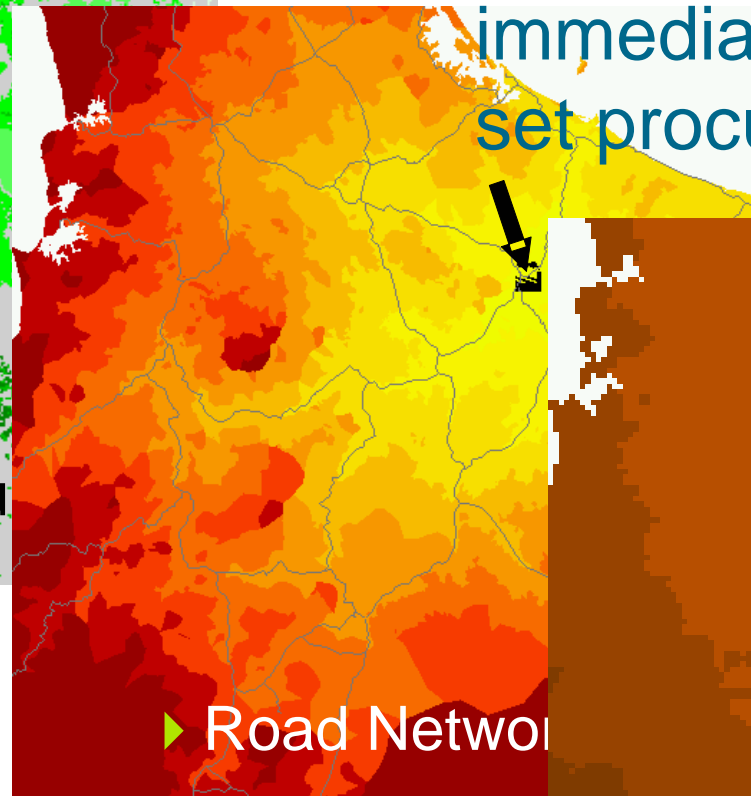
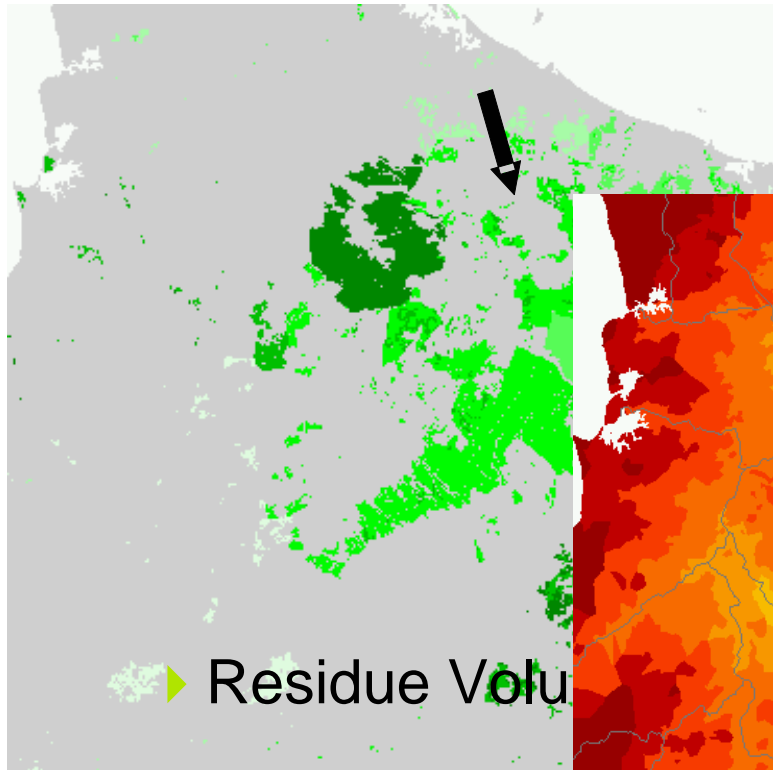
### Cost Analysis of EtOH Manufacture



# Feedstock Availability

Based on residues:

- 90 million litres capacity immediately available at set procurement cost



- No significant technical barriers to using softwood for ethanol
- Economics comparable with state-of-play second generation biofuels
  - ▶ Further value creation available
- Seek to proceed onwards
  - ▶ Extend partnerships
  - ▶ Optimisation
  - ▶ Pilot-scale processing
  - ▶ Build up existing models
  - ▶ Seek demonstration scale – 90 ML/yr