

### Motivation and Objectives

- Hawai'i consumed 2.5 trillion liter of jet fuel in 2024
- Par Hawai'i refinery HEFA unit has total distillate production capacity of 230 million liter per year
- Sources of feedstock
  - Default: Imported renewable oils
  - Alternate: Locally grown oilseed
- Objective: Evaluate the cost of growing and processing an oil seed crop, pongamia (*Milletia pinnata*), in Hawai'i for use in SAF production

### Summary

- HEFA unit operating at Par Refinery in Honolulu
- Hawai'i oil seed industry is small
- Opportunity to expand oil seed production
- Pongamia growing conditions widespread across state
- Under conservative statewide production scenario, pongamia based SAF could equal ~3% of Hawai'i 2024 jet fuel consumption

### Results

- Pongamia seeds can be produced at a farmgate cost of \$412 per Mg, competitive with soybeans imported from out of state
- OEM survey identified 160,000 Mg/yr seed-in-pod decortication facility matched with 63,000 Mg/yr seed crushing facility
- At this unit scale, a processing location in the northern area of Hawai'i island minimizes total hauling cost measured in Mg-km
- Delivered cost of pongamia oil produced and processed on Hawai'i island and shipped to Honolulu estimated to be \$2,100 per Mg

### Economic results for cost of seed production

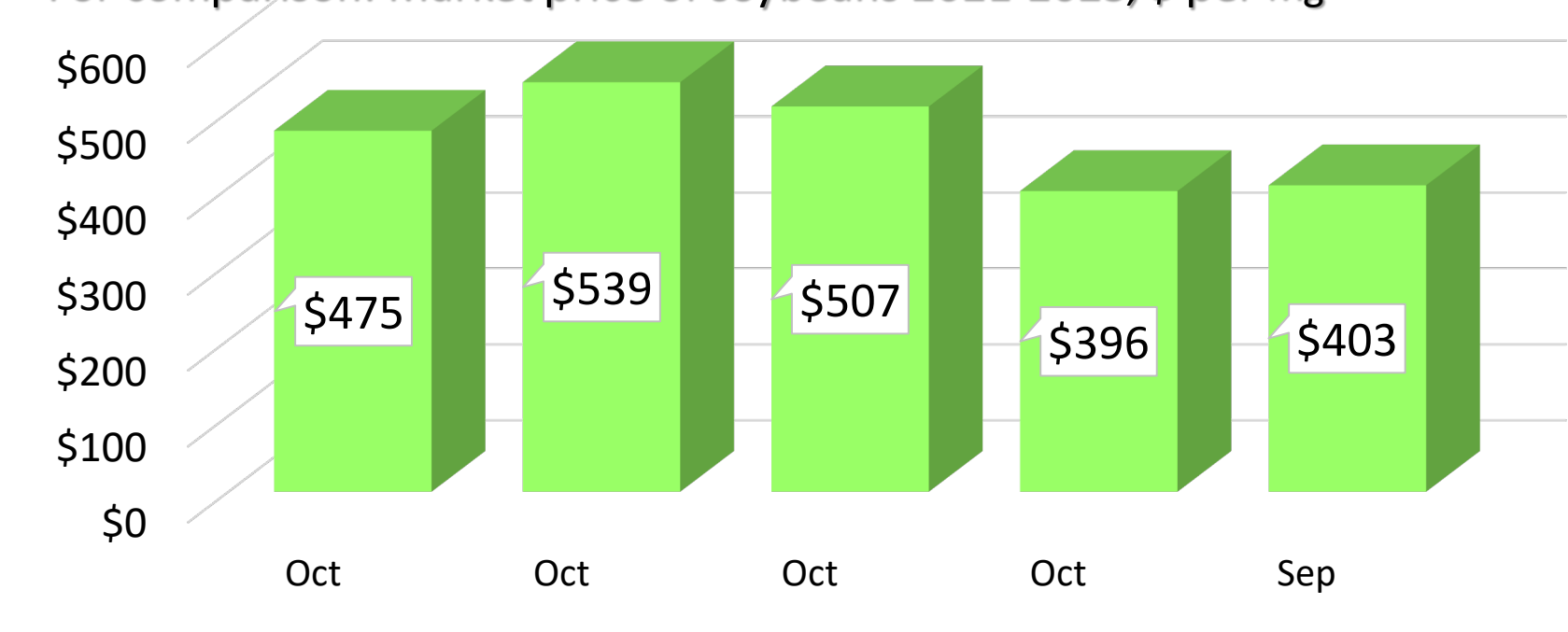
Total cost - 25 years - 640 acres	
Planting	\$3,574,204
Cultivation - sapling trees	\$1,854,162
Cultivating - bearing trees	\$3,088,355
Harvest	\$5,331,246
<b>Total cost</b>	<b>\$13,847,968</b>
<b>Total seed</b>	<b>33,616 Mg</b>

Average  
annual cost  
\$865  
per acre

Average  
annual yield  
2.10 Mg seed  
per acre

Average unit  
cost  
\$412  
per Mg seed

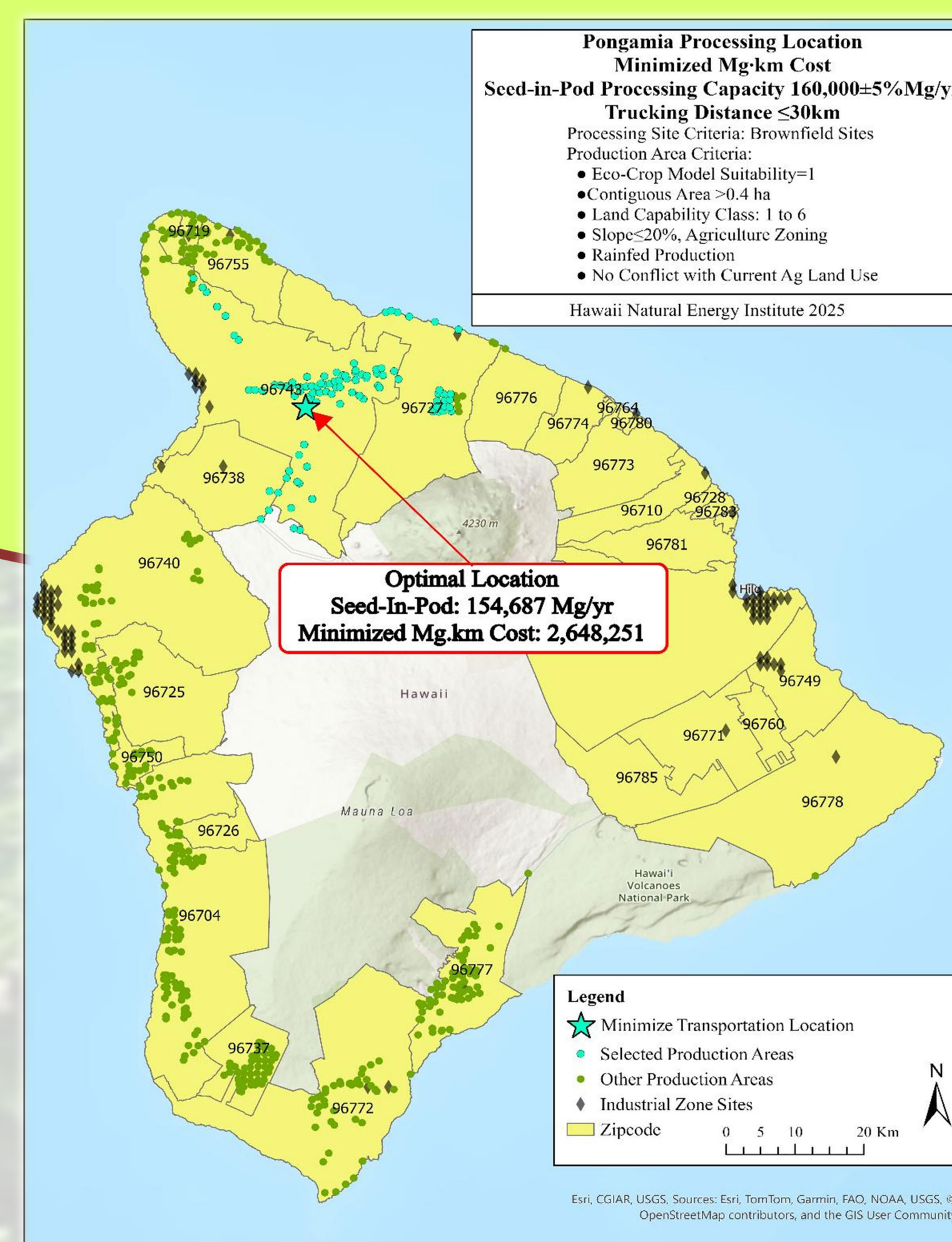
For comparison: Market price of soybeans 2021-2025, \$ per Mg



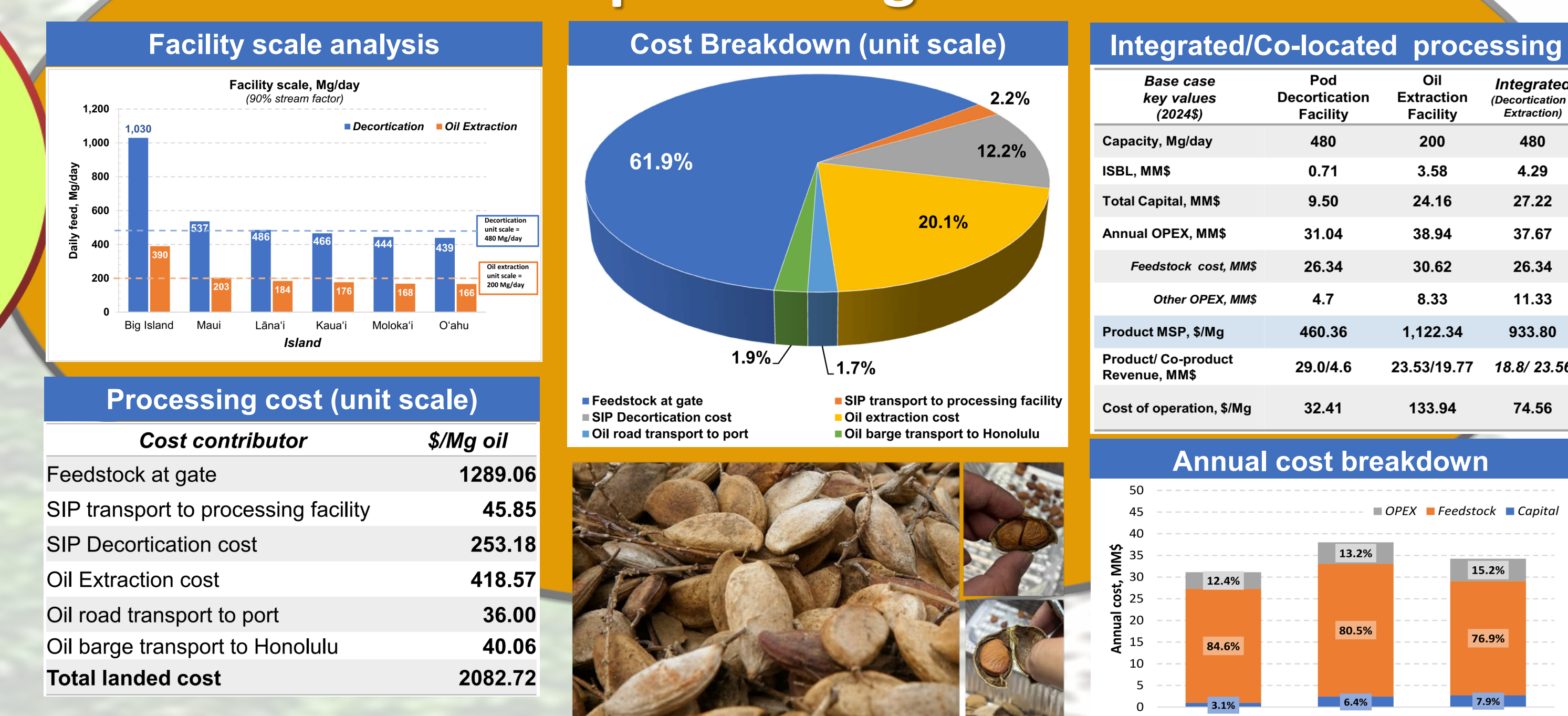
### Methods and Materials

- Economic analysis of feedstock production
- Eco-Crop model identified suitable pongamia production areas
- GIS analysis of growing areas and facility citing
- TEA analysis of seed transportation, hulling and crushing

### GIS results for optimal growing locations and oil facility siting



### SIP to oil processing TEA results



### Conclusions

- Agricultural areas across state are suitable for pongamia production and could support multiple processing facilities
- Farmgate production cost of pongamia seed is comparable to soybean market price
- Next Steps:
  - Analysis to be extended to other islands, additional oilseed crops, integrated processing systems
  - Analyze economic benefits and improved energy resiliency resulting from local renewable oil production systems

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