
Algae: Pond Power Getting Commercial

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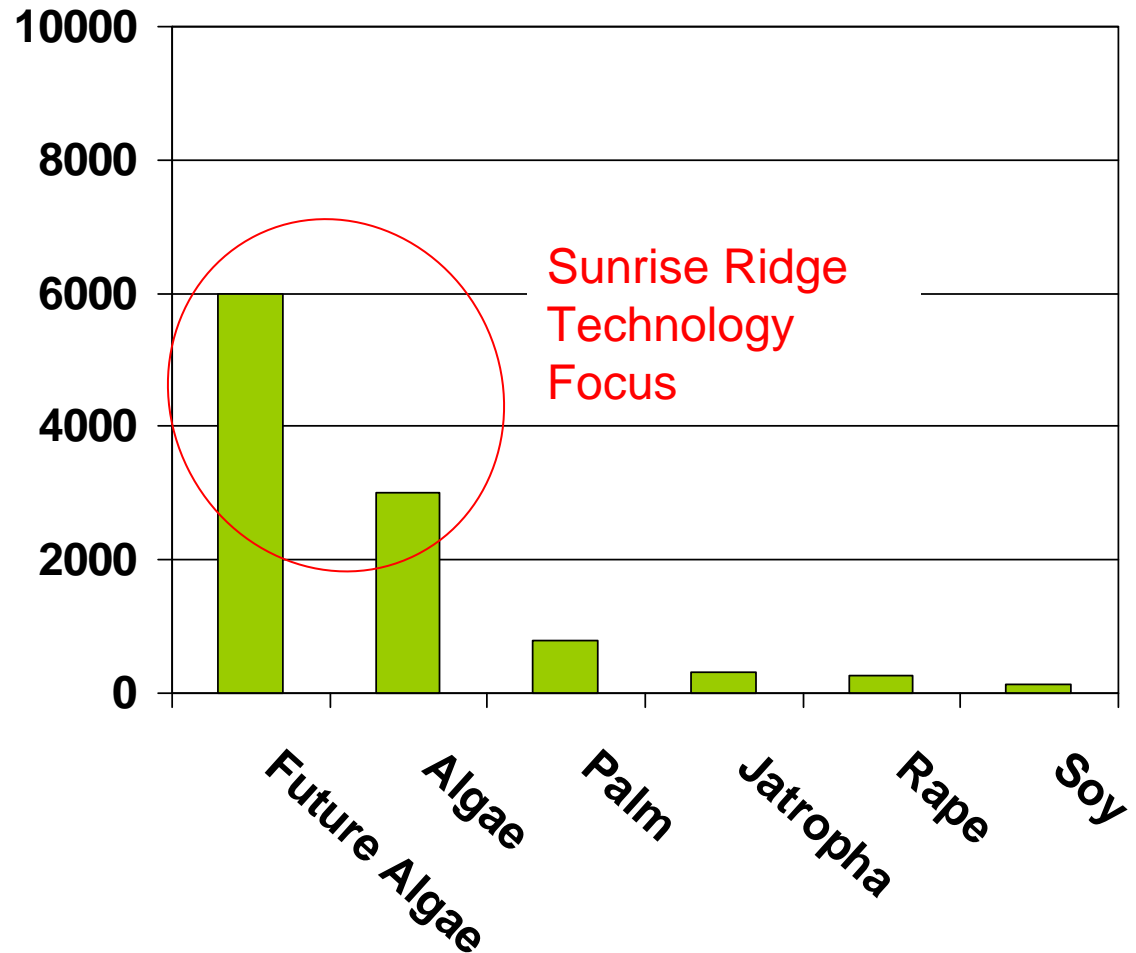


Why We Like Algae

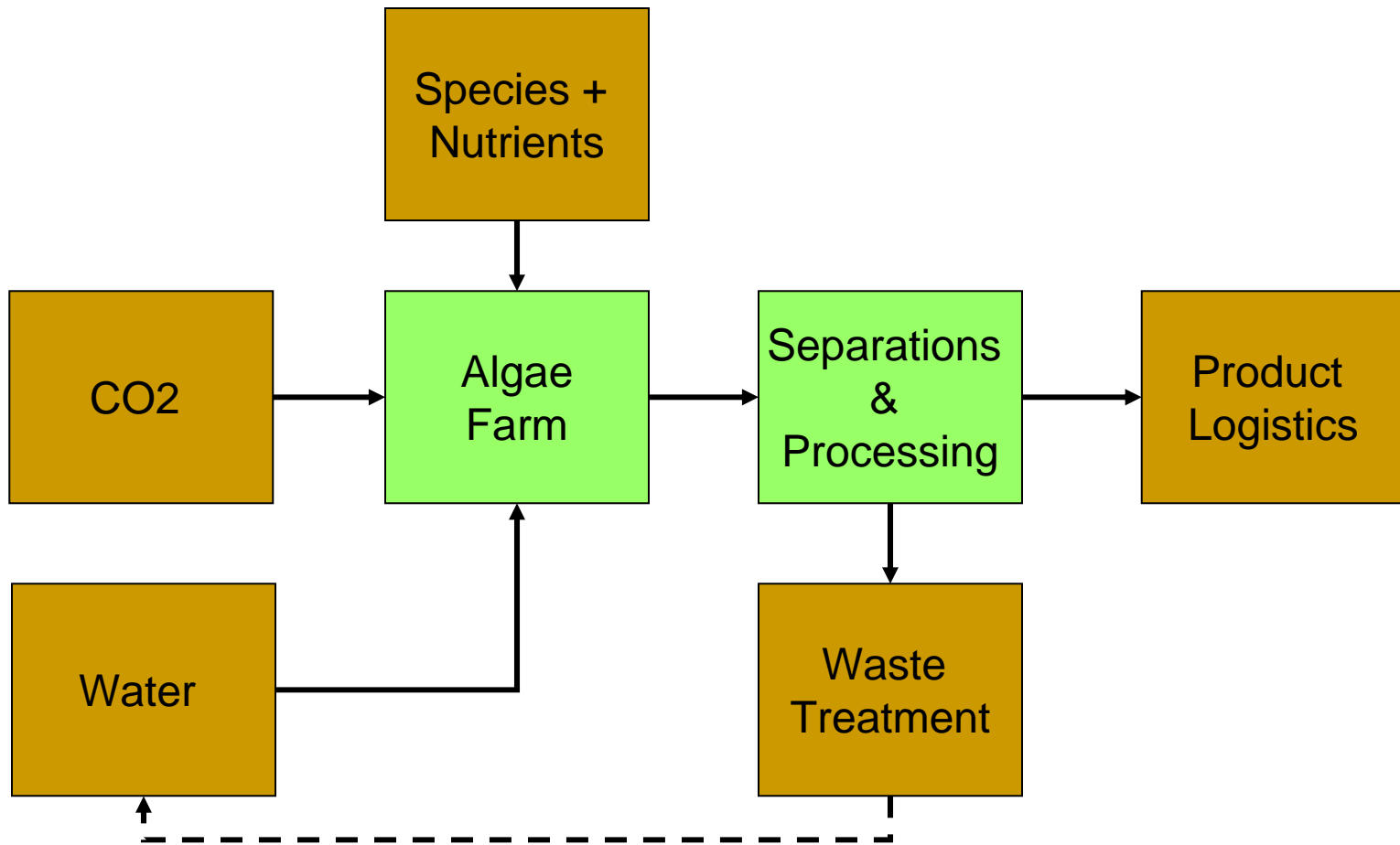


Oil Yield, Gal / Acre / Year

- It makes diesel
- Compatible with existing fuel infrastructure
- Doesn't compete with food
- It makes high protein animal feed
- Reduces greenhouse gas
- Does not require arable land



Technical Challenges: Cost, Yield, Scale, Consistency



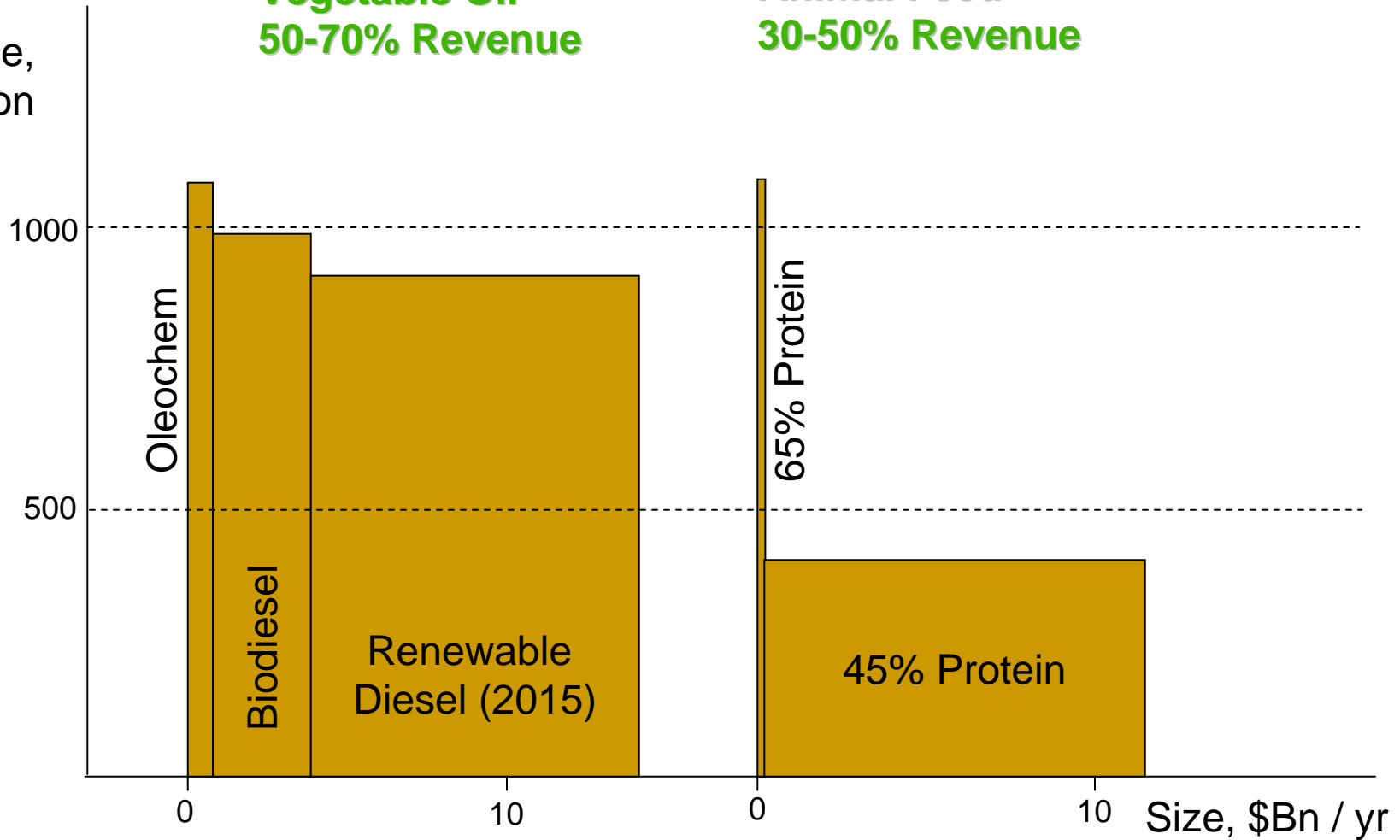
Target Markets - \$3.25 / gal diesel



Vegetable Oil
50-70% Revenue

Animal Feed
30-50% Revenue

Price,
\$/Ton



Techno-Economics - Targets



- Based on our models for an “interesting” project at reasonable revenue assumptions
- Targets include:
 - Biomass yields $> 75 \text{ g / m}^2 \text{ / day}$ AND
 - Oil yields $> 30\%$

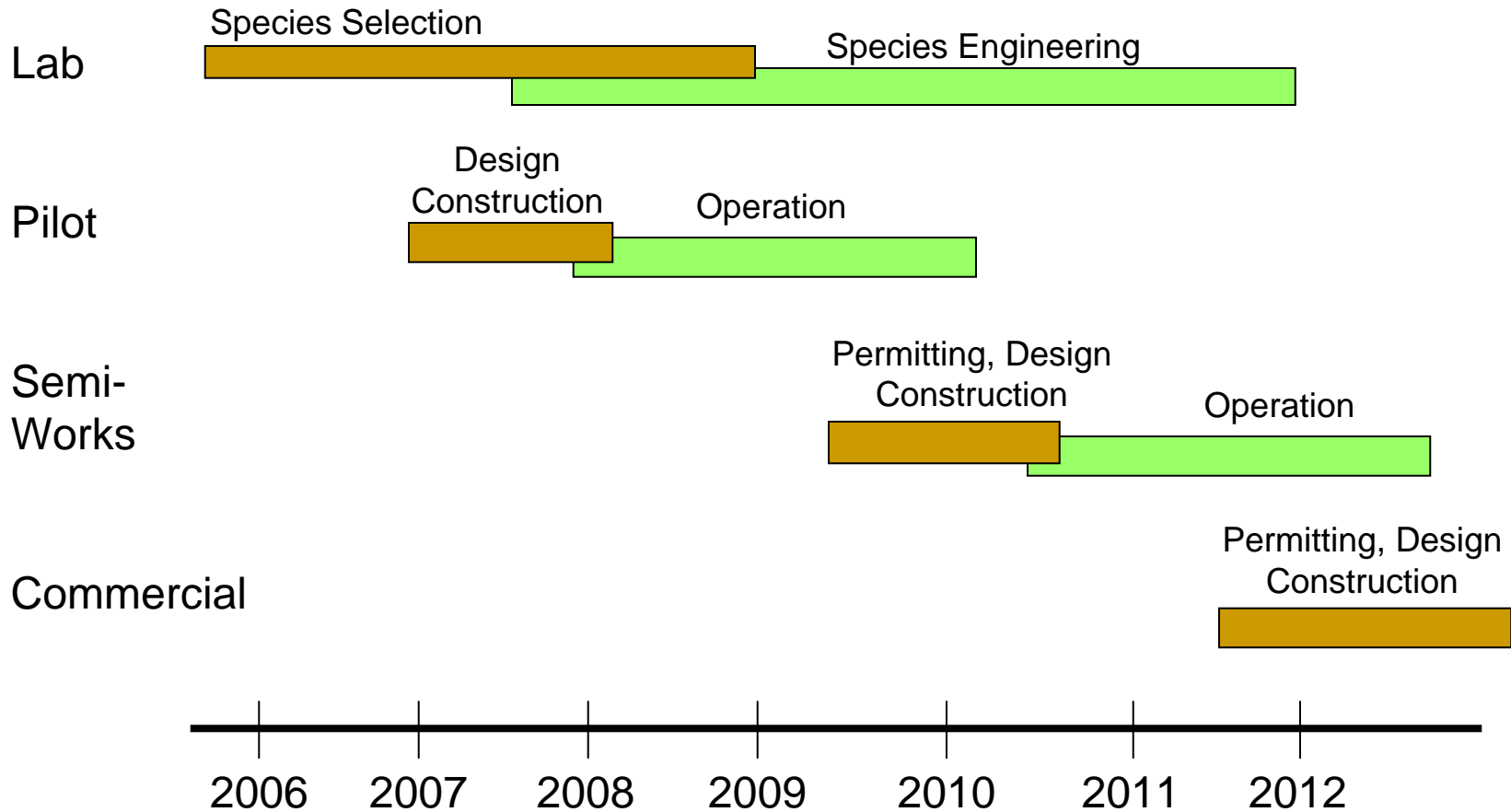
 - Greenhouse cost $< \$2.00 \text{ psf, all in}$ AND
 - Separation cost $< 0.40 \text{ / gal oil, all in}$ AND
 - Byproduct is recovered and sold at feed value

Cooperation for Longer Term



Challenge	Issue	Fix
Obtaining Inputs	CO₂, H₂O, Money and Land: Siting in 4-Way Commercial Venture	Site Prioritization Standard Contracts
Obtaining Permits	NIMBY, Species, Water	Education Lobbying Recycle Design
Penetrating Markets	New Products Logistics Integration	Government Offtake “Guarantees” Product Standards Testing Commodity Markets
Creating Confidence	“Exuberant” Claims	Credible Industry Associations Education

Getting Commercial



- Educate our Government
 - Technology neutral renewable fuel legislation
 - Cap and trade greenhouse gases
 - Support for research and development
 - Support for market opening requirements
- Educate our Consumers
 - Consequences of petroleum future
 - Benefits of algae-based fuels
 - Benefits of algae-fed animals