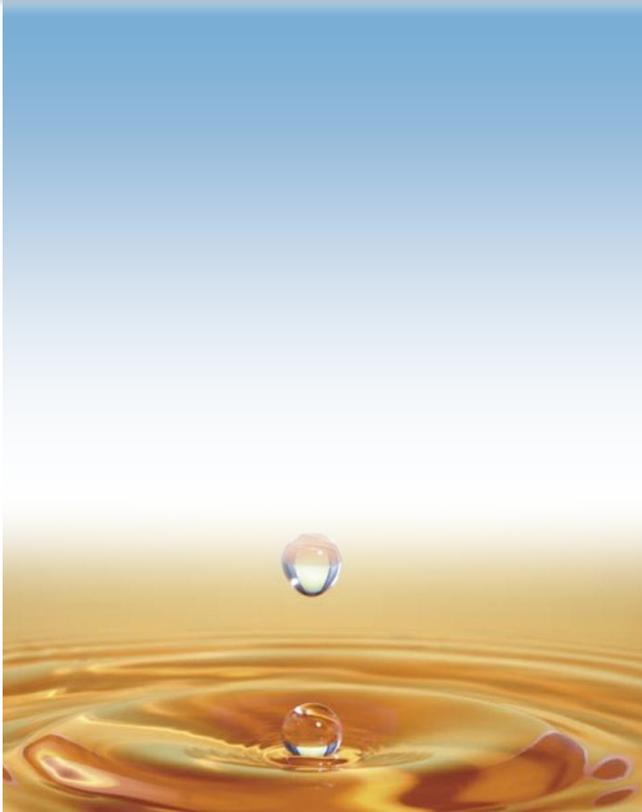




NREL 21st Industry Growth Forum
Pamela R. Contag, PhD
Founder, Cobalt Biofuels
September, 2008



- Produce low cost biobutanol for the chemical and transportation markets
- Near term completion of a pilot scale plant
- Develop partnerships for production scale biorefineries
- Raise \$5-10M in additional equity in our Series C

- Cobalt Biofuels first funding in November 2006
- \$38 million raised to date
- We have achieved significant milestones
 - Proof of concept demonstrated in March 2008
 - Completed Series C financing Sept 2008
 - Scale up plans developed, construction begins Fall 2008
- We are ready for scale up and commercialization
 - 35,000 gallons per year pilot in 2009
 - 2.5 million GPY pre-commercial in 2010
 - 25 million GPY plant in 2012
 - We are expanding relationships with feedstock providers, offtakers, EPC community, government, etc.

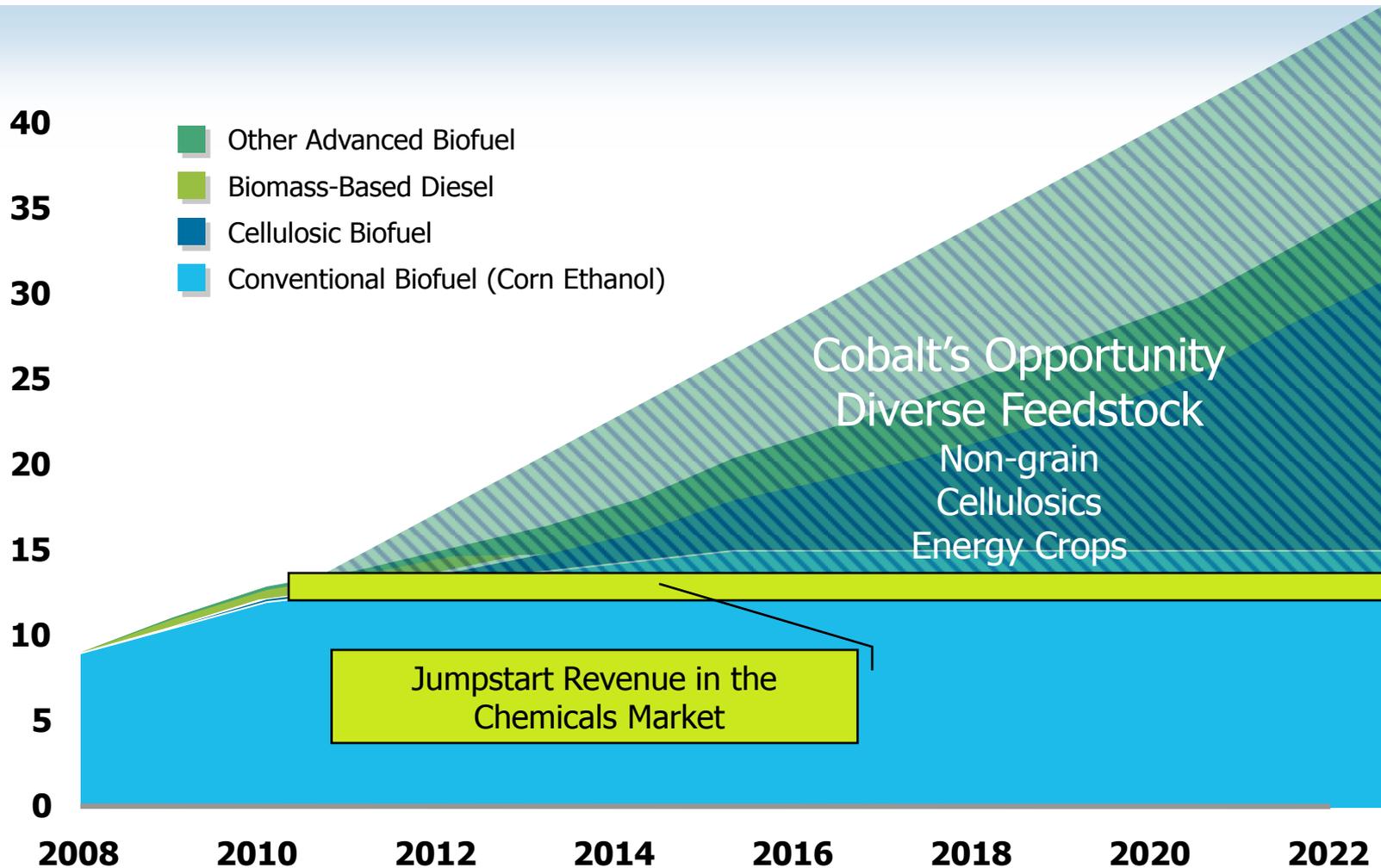
Butanol

- 90% of BTU's/gal of gasoline
- Multiple feedstocks can be used
- Can be transferred through existing pipeline infrastructure
- Can be used at 100% or can be blended with fossil fuels
- Managed like gasoline in the distribution network
- Complementary to ethanol because it enhances performance of ethanol blends in gasoline

Ethanol

- 70% of BTUs/gal of gasoline
- Infrastructure built around corn
- Cannot be transferred through the existing pipeline infrastructure
- Limited to 10% mix except in special engines
- Requires special handling due to evaporative, corrosive, explosive properties

The Opportunity: Chemical and Transportation Industries



- Chemical Butanol Market

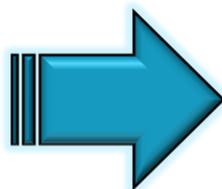
\$ 864 M Globally

- Solvents
- Cleaners
- Chemical Feedstock

- Transportation Fuel

\$ 43 B US

- Auto
- Planes
- Fleets (trucking/other)
- Railway



- Similar Market Drivers

- Price of oil
- Adoption rate of “bio” fuels
- Regulation of additives
- Cost of feedstock
- High value chemical feedstocks

○ Competitors

- Indirect:
 - Oil
 - Ethanol
 - Biodiesel
 - Solar
- Direct:
 - Green Biologics, TetraVitae
 - Gevo, OPX,
 - Other: Amaryis, Coscata, LS9, Solazyme

○ Barriers to Entry

- Technology that improves historical performance
- Cost of scale-up
- IP



Market Approach

- Exploit Cobalt's competitive advantage
 - Butanol is a better fuel than ethanol
 - Clostridium is diverse and degrades C5 and C6 sugars
- Position butanol as a high value chemical or fuel additive
 - Sell into chemical solvent market at precommercial stage
 - Improves the performance of ethanol, diesel and gasoline
- Focus on DoE-favored, low-cost feedstocks with high hemicellulose content
 - Wood pulp
 - Sugar beets and beet processing byproducts
 - Energy, forage or sweet sorghum

Cobalt's Proprietary Strains Degrade Diverse Feedstock To Produce Butanol

Feedstock Component	Yeast Ethanol	E.coli Ethanol Butanol	Clostridium Butanol Acetone
Glucose (C6)	Yes*	Yes	Yes
Xylose (C5)	No	<i>Yes – after utilization of all glucose</i>	Yes
Pectin	No	No	Yes
Starch	No*	No	Yes*
Cellobiose	No	No	Yes*
Hemicellulose	No	No	Yes*
Cellulose	No	No	Yes*

***Demonstrated at Industrial Scale**

Cobalt Sweet Sorghum – Feedstock based on one growing season per year

Note: corn ethanol maximum ≈ 420 gal/ac

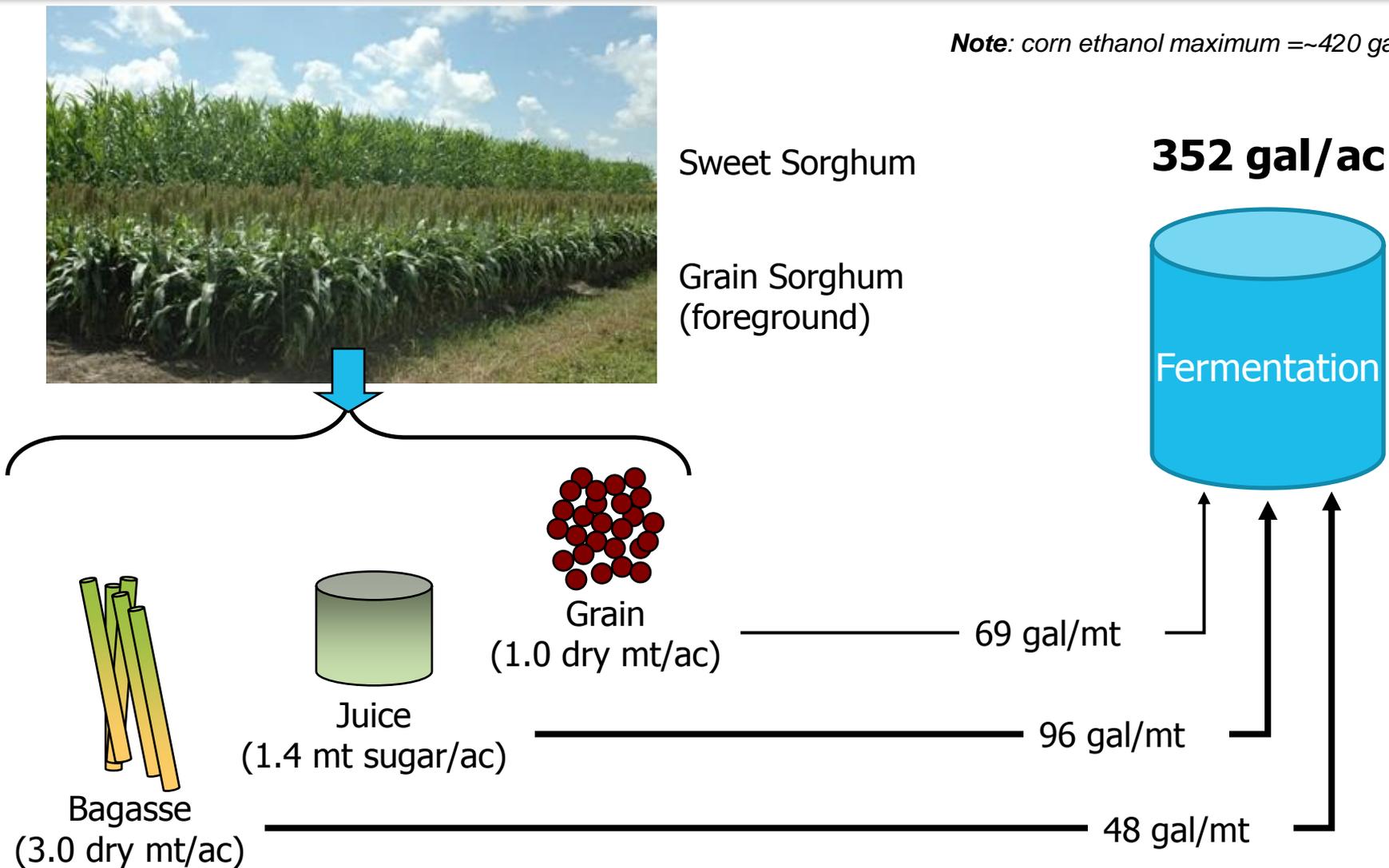
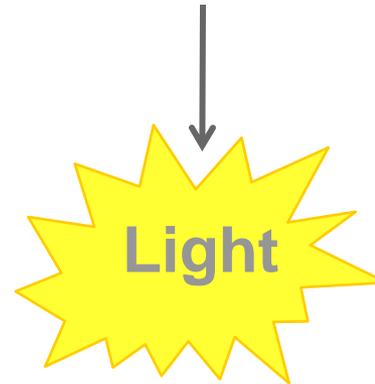
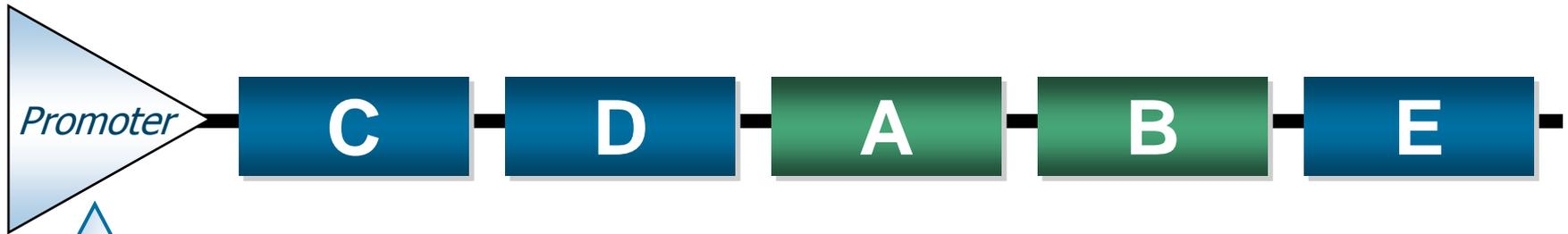


Photo Credit: *Texas Agricultural Experiment Station*

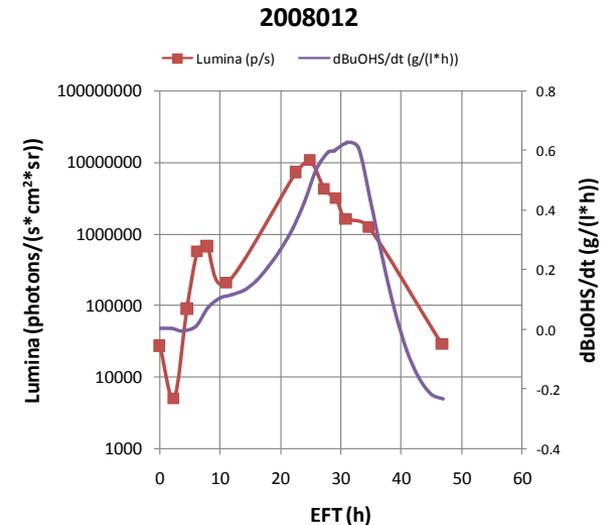
Technical Approach -- High Level Goals

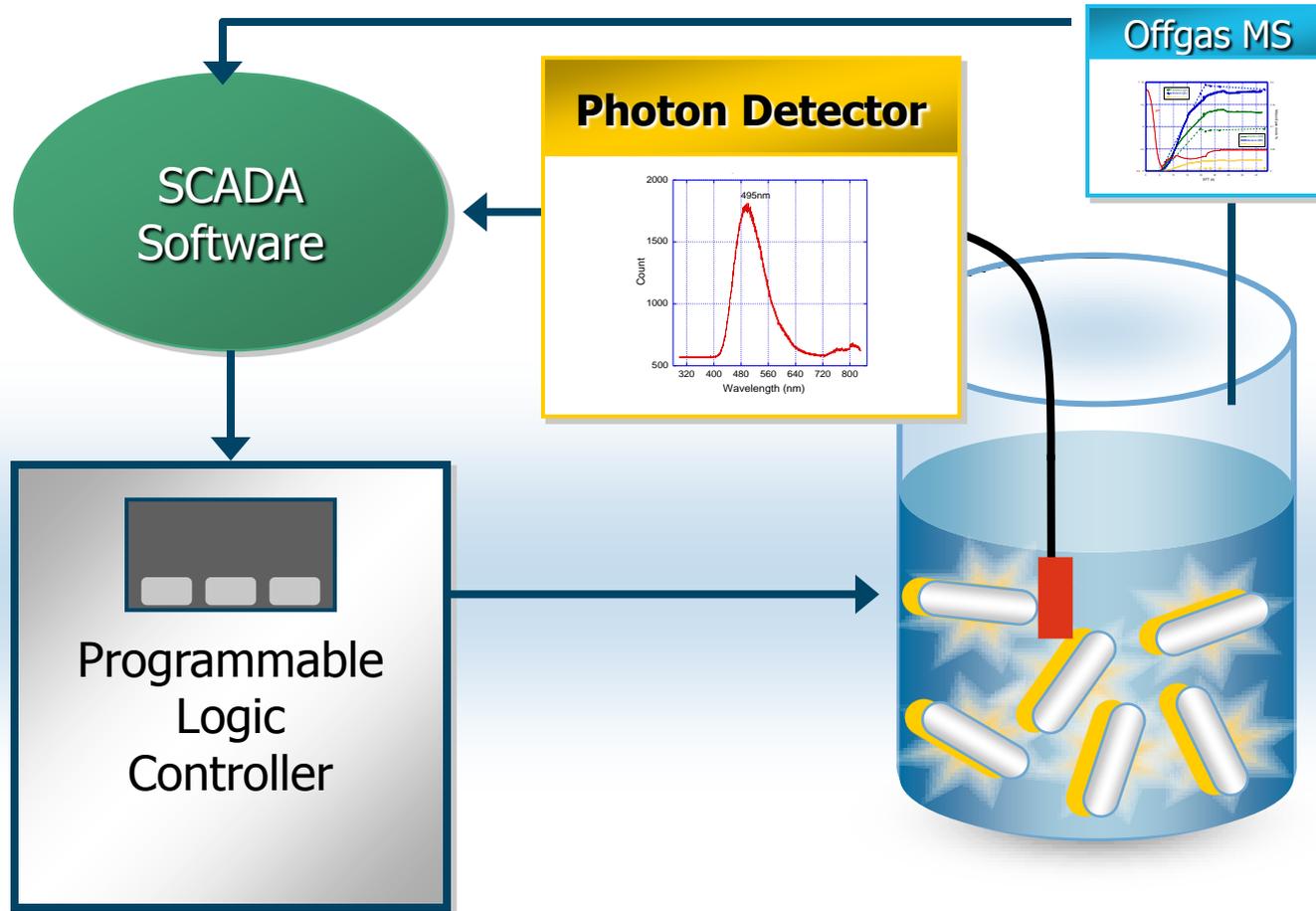
- Use of low cost feedstock
 - One of top two cost components and potentially volatile
- Reduction in energy usage
 - Other of top two cost components
 - Achilles heel of traditional butanol production
- Maximize value of process by-products
 - Sell, recycle or convert to energy
 - Potential stream of revenue; vital offset to costs
- Minimize capital intensity with novel technology
 - Increases project equity returns

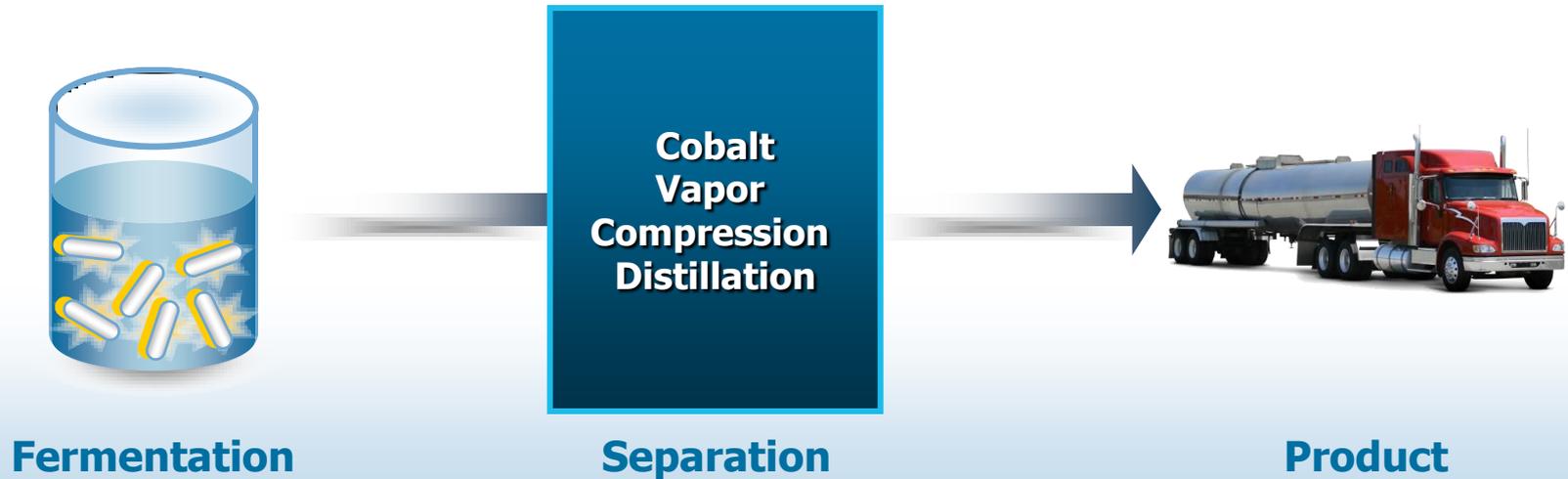


Expression of Luciferase in *Clostridium*

Utilize Different Promoters to Monitor Biobutanol Production







- Traditional Butanol Separation (Distillation) Accounts For 40-70% of Total Production Energy
- Cobalt Patented Separation Technology Reduces Separation Energy by 50-75%

The Team to Implement and Scale

Rick Wilson, PhD
CEO

- Amoco/BP

Pamela Reilly Contag, PhD
Founder and CTO

- Xenogen

Steven K. Shevick
CFO

- Synopsys, Ausra

David DeNola
COO

- CIPHERGEN Biosystems, Arbor Vitae

Ben Carter
VP Finance

- Xenogen

Hendrik Meerman, PhD
Director Bioprocessing

- Genencor

David Walther, PhD
Director Engineering

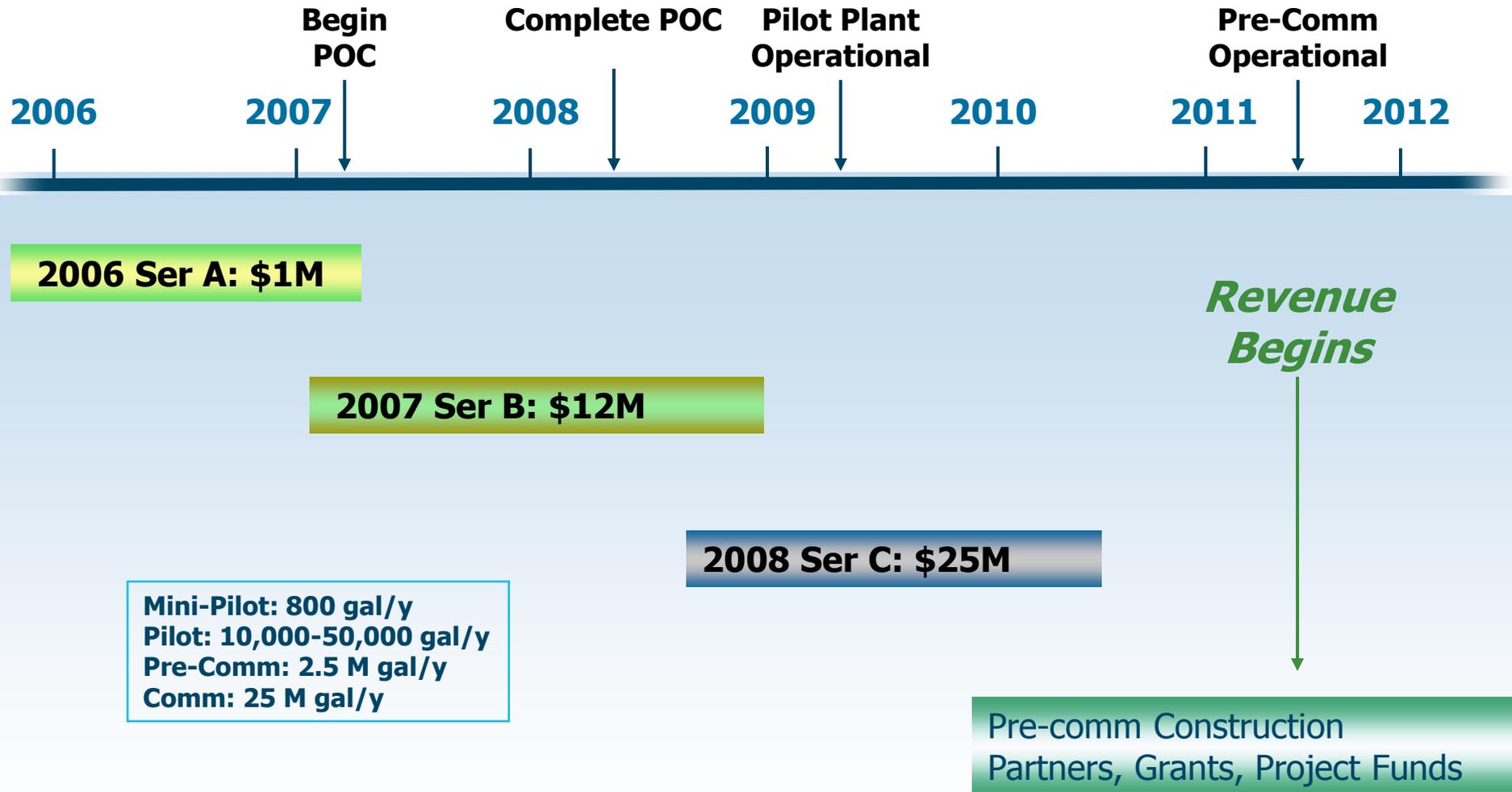
- UC Berkeley

Stacy Burns-Guydish, PhD
Director Microbiology

- Stanford

25 employees as of Oct 20, 2008

Timeline to Commercialization



		Completed	In Progress
<div style="background-color: #006644; color: white; padding: 10px; text-align: center;"> <h2>Technology Proof of Concept</h2> </div>	<ul style="list-style-type: none"> Utilizes a variety of feedstocks Reaction management can increase productivity by 100-300% Platform technology 	<ul style="list-style-type: none"> ✓ ✓ ✓ 	
<div style="background-color: #006644; color: white; padding: 10px; text-align: center;"> <h2>Large Scale Facility</h2> </div>	<ul style="list-style-type: none"> Equipment and strains - 15L data complete Selected top ranked EPC firm Design for scale-up Facility site selection and construction 	<ul style="list-style-type: none"> ✓ ✓ ✓ 	<ul style="list-style-type: none"> ✓
<div style="background-color: #006644; color: white; padding: 10px; text-align: center;"> <h2>Pre-commercial Plant</h2> </div>	<ul style="list-style-type: none"> Feedstock: sugar beets, sweet sorghum, pulp Site and partner selection Project financing / Non-dilutive funding 		<ul style="list-style-type: none"> ✓ ✓ ✓
<div style="background-color: #006644; color: white; padding: 10px; text-align: center;"> <h2>Commercial Plant</h2> </div>	<ul style="list-style-type: none"> Site Partners for feedstock and distribution Project financing / Non-dilutive Funding 		<ul style="list-style-type: none"> ✓ ✓ ✓

