



# Introduction to LS9



**LS9, INC.**

THE RENEWABLE  
PETROLEUM COMPANY.

# LS9 Overview



## Low-Cost Producer of Petroleum Replacements from Renewable Feedstocks

- The low-cost producer of renewable fuels and specialty chemicals
  - Highly-efficient metabolic pathway and microorganism
  - Unique, one-step conversion process
  - Competitive with crude oil at \$45 per barrel
  
- Single platform: multiple products
  - Fuels
  - High-value specialty chemicals
  
- Proprietary proven technology
  - Pilot production of vehicle-ready fuel complete
  - Multiple patent families
  
- Capital efficient business model
  
- Seasoned management team with deep domain expertise

# LS9 Team

## Veteran Management Team and Blue-Chip Investor Base

### LS9 Executive Team



**Bill Haywood, CEO**

Over 30 years of experience including SVP of Manufacturing for Tesoro Petroleum and Regional VP of Ultramar Diamond Shamrock



**Steve Del Cardayre,  
VP Research and  
Development**

Over 17 years experience leading development of biocatalytic technologies, including 10 years at Codexis and Maxygen



**Wei Huang,  
VP Process Development  
and Engineering**

Over 17 years of industrial bioprocess experience, including Director of Process Engineering at Fluor and Bechtel



**Clayton Headley,  
VP Development and  
Commercial Operations**

Over 17 years of transaction and business growth experience including VP Minerals Services at Koch Industries



**Greg Pal,  
Senior Director  
Corporate Development**

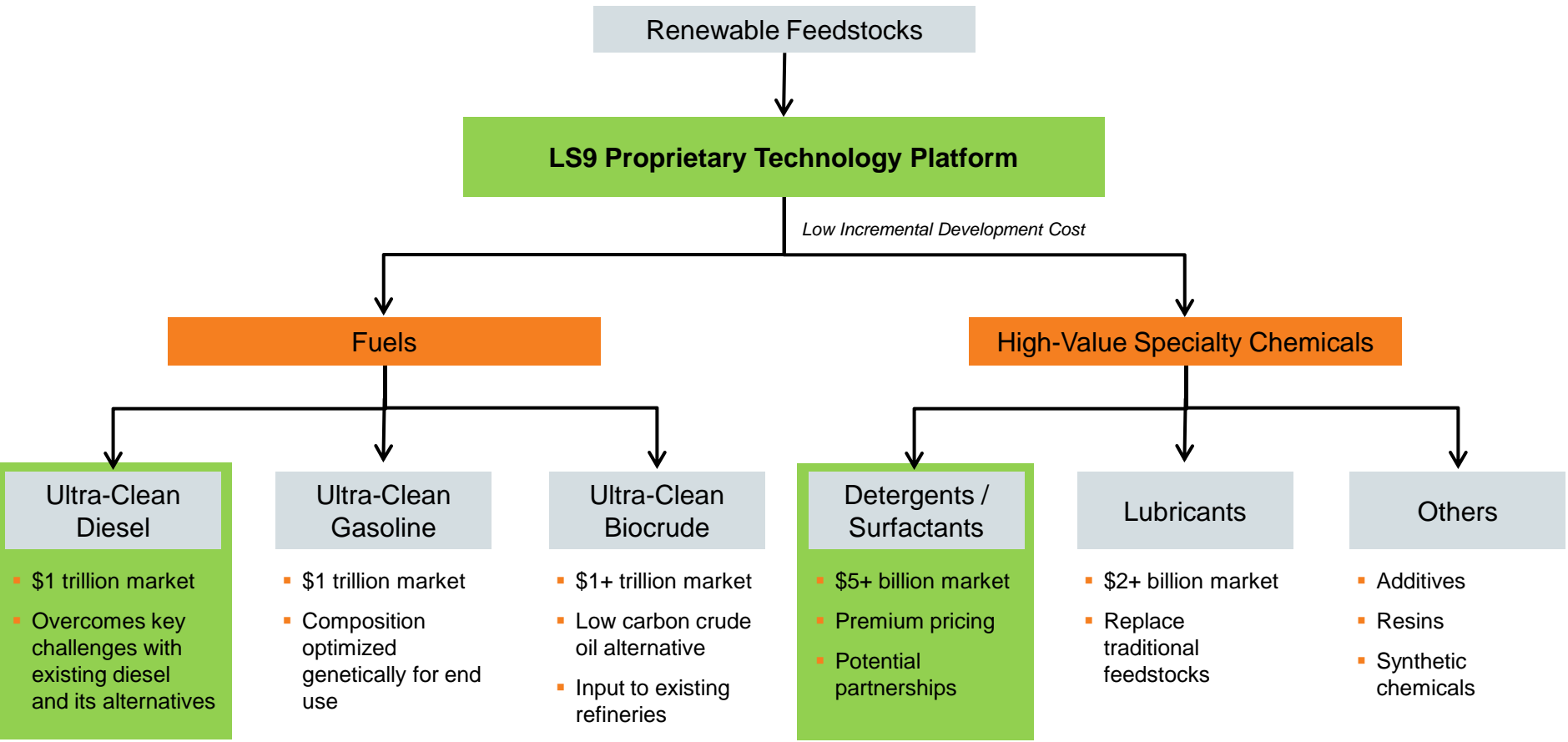
Over 10 years of marketing and business development experience, including Directorships at Tellme Networks

### LS9 Investors



# LS9 Portfolio of Products

## Platform Technology Generates Multiple Transportation Fuels and Industrial Chemicals

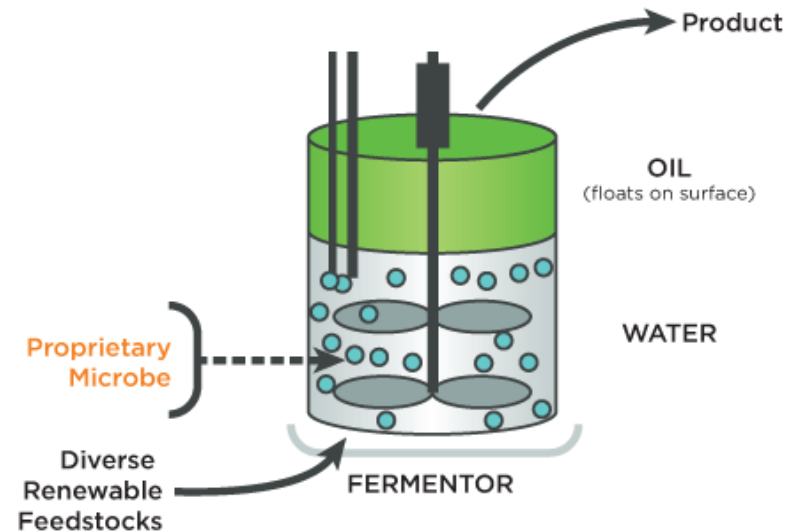


# LS9 Technology Platform



## Modify and Control the Cell's Natural Energy Storage Mechanism

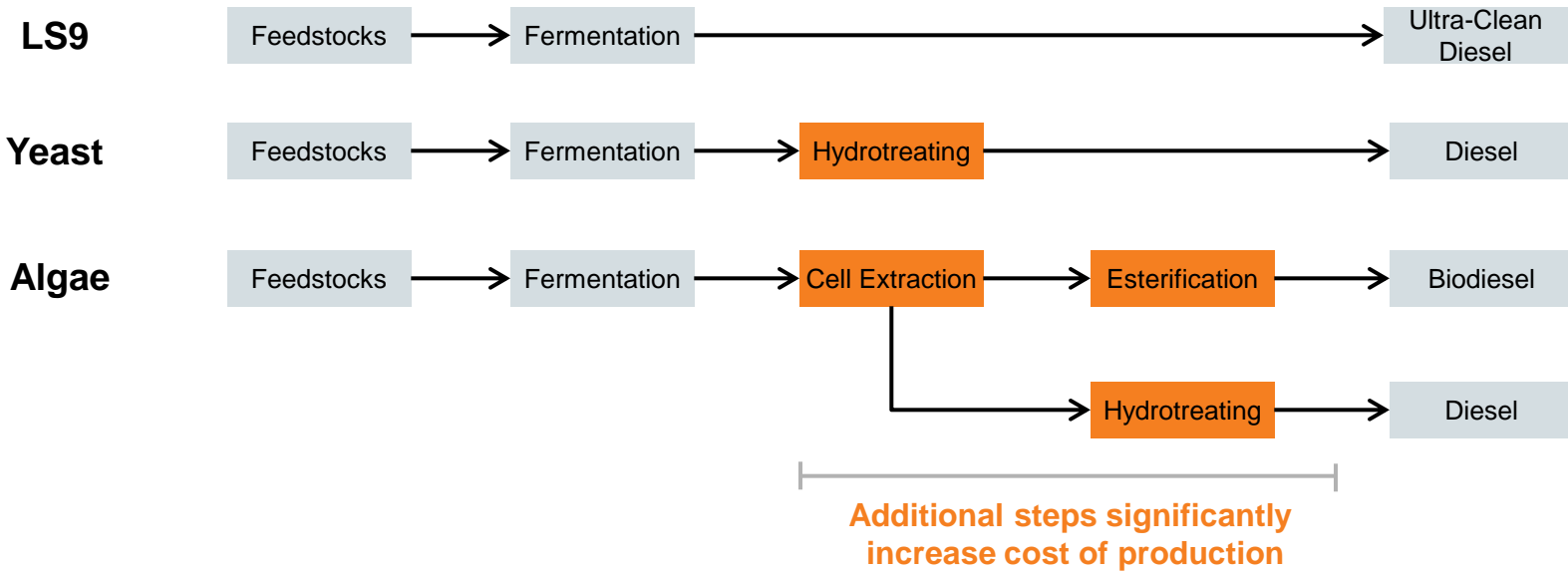
- Over 90% energetically efficient - highest of any comparable pathway
- Process makes a finished product - no additional processing
- Technology is feedstock agnostic - use cheapest and most abundant renewable feedstock
- Metabolic modeling and synthetic biology enable LS9 to control precise fuel composition genetically



# LS9 Technology Platform



## Other Fermentation-Based Routes to Diesel Require Costly Additional Processing Steps















- Only company that combines most efficient pathway with one-step conversion
  - Validated through successful pilot production of Ultra-Clean Diesel

# LS9 Ultra-Clean Diesel



Established \$1 Trillion Market; Better Than Marketed Products

	Current Products Challenges	LS9 Ultra-Clean Diesel Solutions
Petroleum Diesel	 Significant GHG emissions	 >75% GHG reduction
	 Contains carcinogens / heavy metals	 No carcinogens / heavy metals
Biodiesel	 Poor product economics	 Utilizes cheap, abundant C5/C6 sugars
	 Inability to scale	 Yields 10x to 20x per acre
	 Poor product properties	 Engineer optimal and precise product formulation
	 Inconsistent product quality	 Identical product composition every batch; meets ASTM standards every time

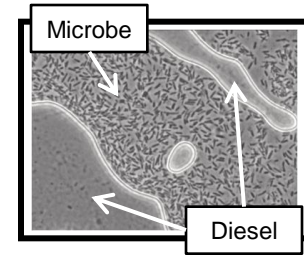
# LS9 Has Built a Living Refinery Inside a Cell

Same Products But Without Same Limitations and Drawbacks

Complex Oil Refinery



LS9 Micro-Refinery



<b>Capital expense</b>	Extremely high, typically several billion dollars	Low
<b>Operating environment</b>	750°C+ and 1000+psi	Ambient temperature and pressure
<b>Carbon footprint</b>	Large	Small
<b>Toxic waste products</b>	SO <sub>x</sub> , NO <sub>x</sub> , benzene	None
<b>Environmental impact</b>	Significant air pollution, odor, noise and wastewater	None

# LS9 Commercial Strategy

## Manufacturing Generates Highest Profits and Returns



- Partner with feedstock suppliers
- Assure most attractive production economics
- Able to utilize both sugar cane and cellulosic biomass
- One-step conversion to finished products
- Strong IP protection
- Build and operate production facilities
- Capital-light optionality
- Joint ventures with opt-in
- Sell finished products at the plant gate
- Will partner for product off-take

# LS9 Pilot Plant

## Making Vehicle-Ready Ultra-Clean Diesel in Pilot Plant

- Operational since September 2008
  - 1000-liter fermenter and downstream processing online
  - Multiple successful production runs
- Ultra-Clean Diesel being produced has very attractive fuel properties
- Able to use multiple feedstocks
- Pilot plant results reflect same performance as laboratory-scale results
  - Scale-up completely successful
- Next step to scale-up to commercially-relevant production
  - Can be used to test other fuels and chemicals



# LS9 Scale Up Strategy



## Next Milestone is Demonstration Plant Success

- Major milestone is reached by mid-2010

