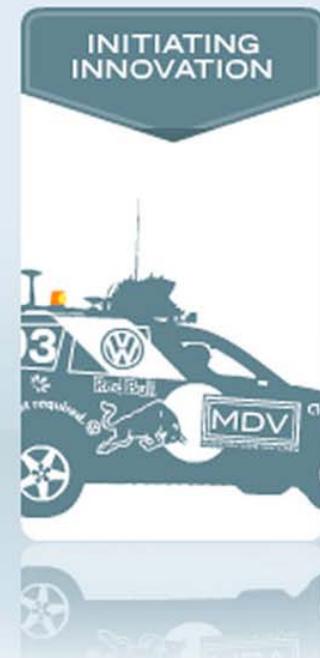
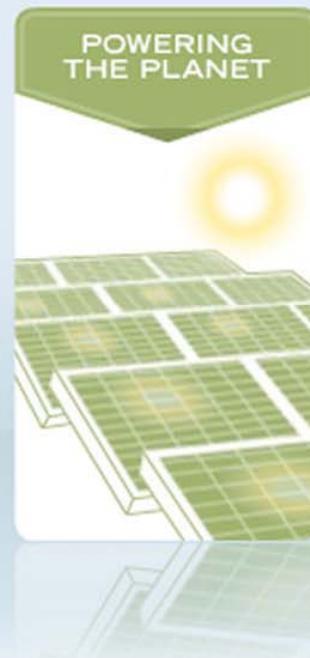


Venture Investing in BioEnergy



Will Coleman
Biomass 2009 – Washington, DC
March 17, 2009



Mohr Davidow Ventures

- **Founded in 1983**
- **\$2 billion under management**
- **~20 investing professionals**
- **Investment sectors:**
 - Cleantech
 - Information Technology
 - Life Sciences
- **Early stage technology focus**
- **100+ funded companies**

Rambus



RECURRENT
ENERGY

ECHELON[®]



OPX BIOTECHNOLOGIES



ZeaChem



Solar



Thin-film Solar



Solar Systems



Solar Development

Fuels/Chemicals



Cellulosic Biofuels



Biodiesel Catalysts



Engineered Chemicals



BioChemicals

Mining/Materials



Coal Gasification

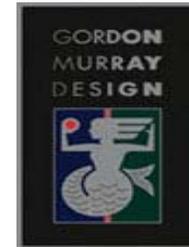


Energy Storage



Building Materials

Transportation



Automotive Design

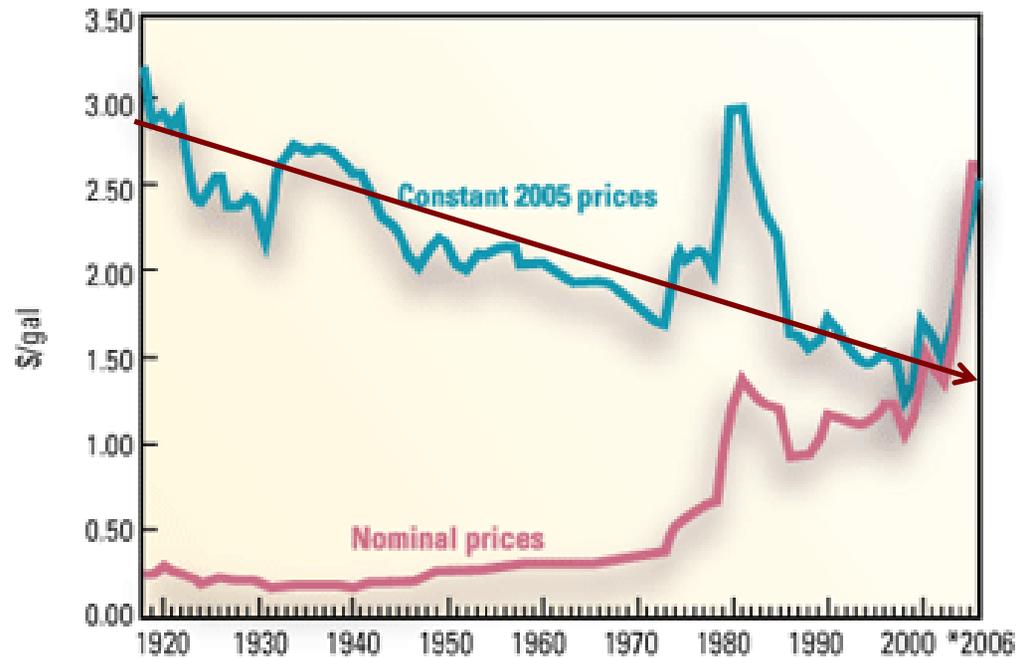


Fuel Cells – UAVs

The premise is not \$100 oil

US AVERAGE GASOLINE PRICES, 1918-2006*

Fig. 1

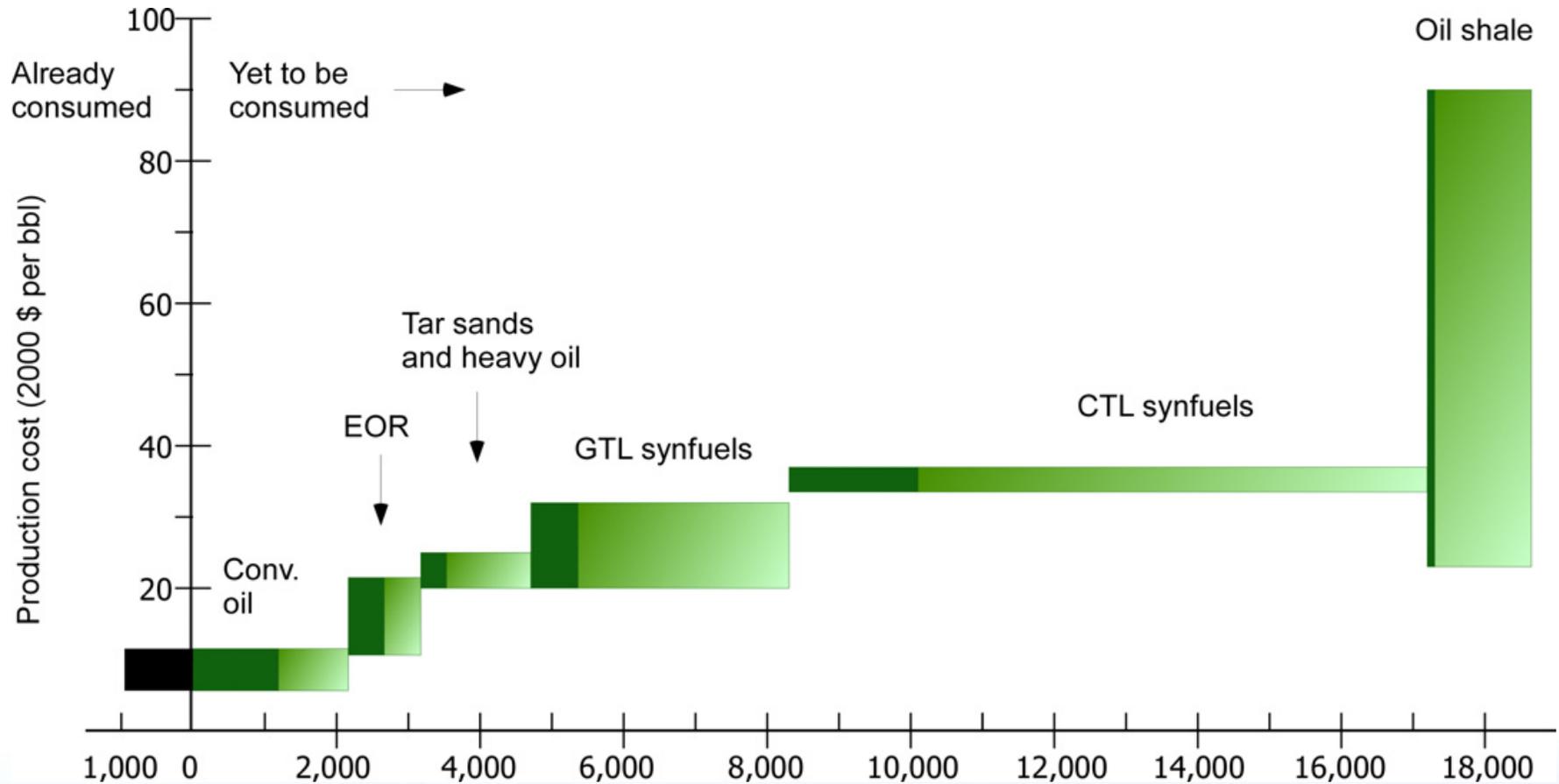


*Through November 2006.

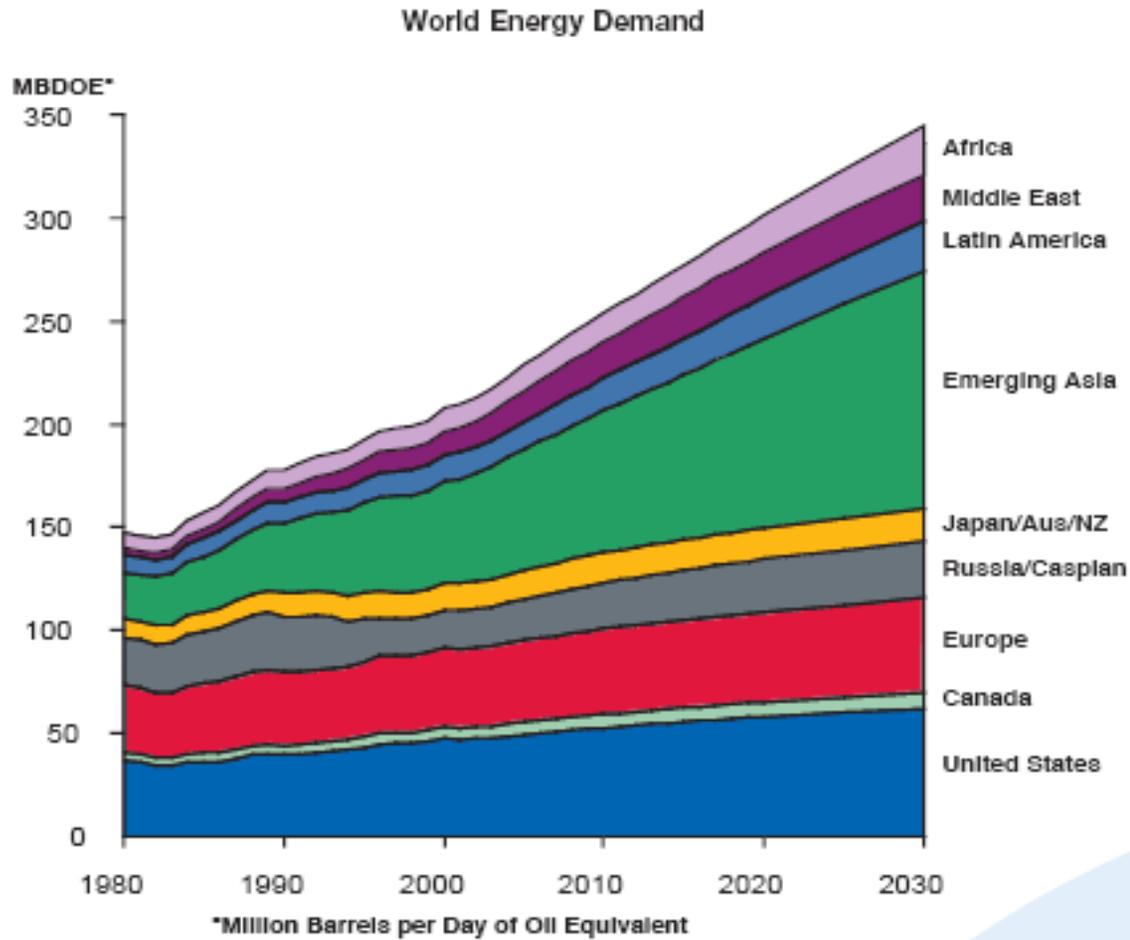
Sources: Cambridge Energy Research Associates, American Petroleum Institute, US Department of Energy

Peak oil depends on willingness to pay

Potential Supply of Liquid Hydrocarbons



Demand will continue to grow globally



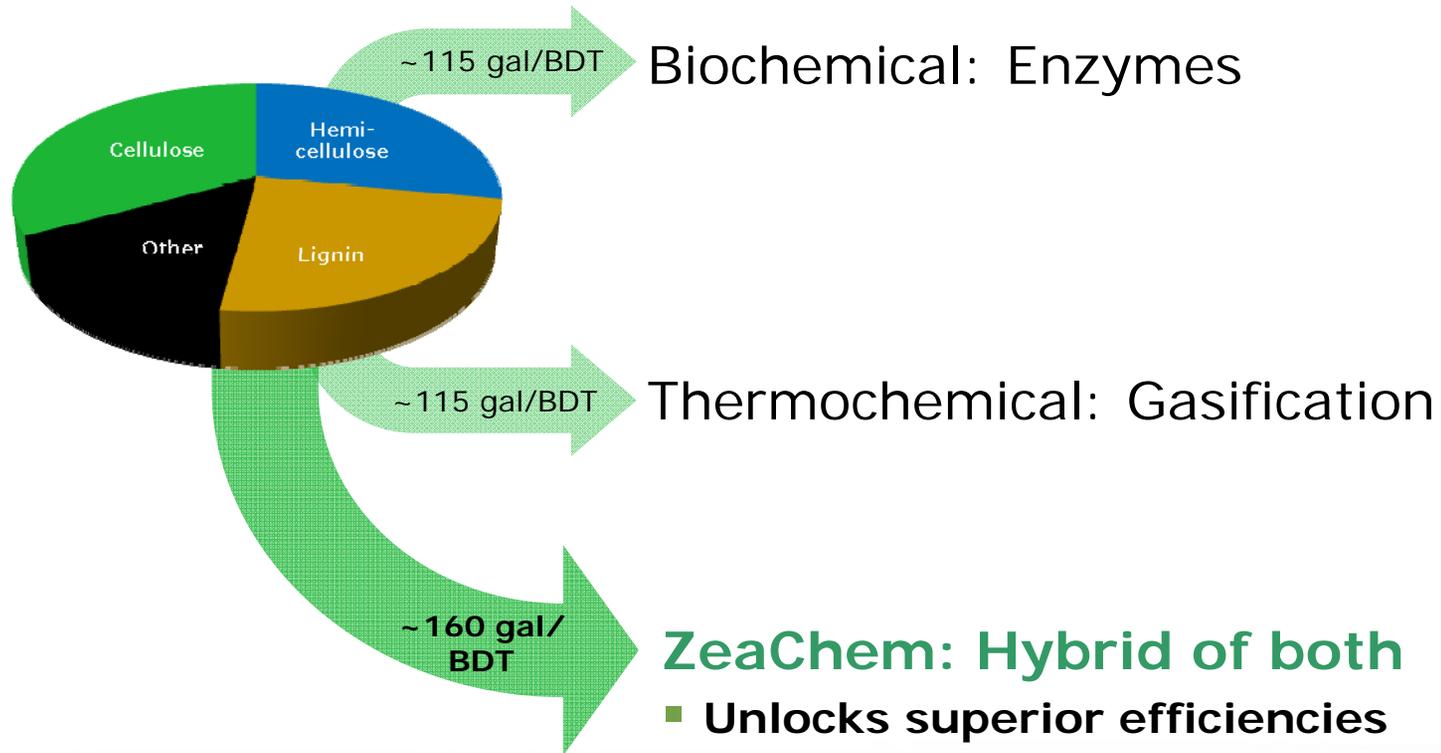
- **The first products are corn ethanol and soybean-based biodiesel, but.....**
 - Land-use efficiency (food vs. fuel)
 - Low energy density
 - Carbon profile
 - Distribution and other issues

- **Next generation products provide increasing promise**
 - Cellulosic ethanol
 - Methanol, butanol
 - Petrochemical replacements – BDO, Acrylic, Alkenes, others
 - Intermediates and other biochemicals
 - Algae-based biodiesel

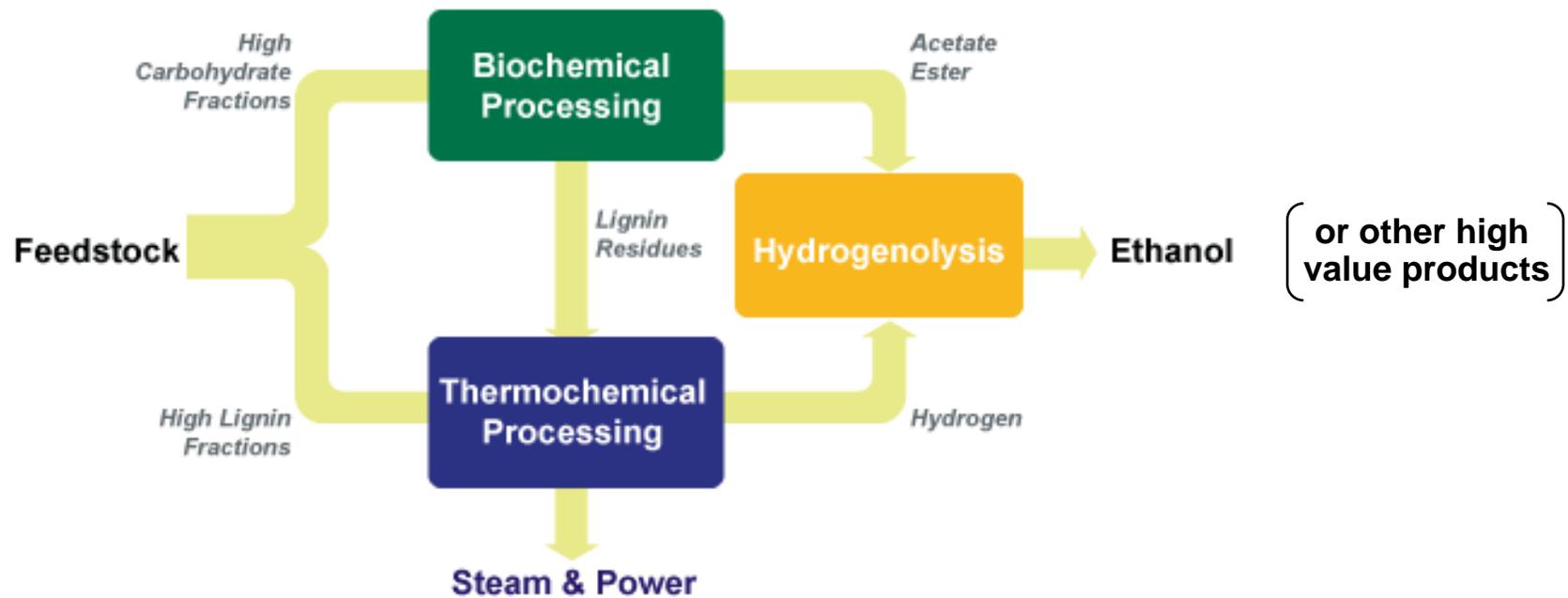
Some examples from our portfolio



Currently two known paths to produce ethanol



BDT = Bone Dry Ton
Yield is highest theoretical maximum



- **Ultra low carbon fuel**
 - 100% carbon utilization in end product
 - Woody biomass feedstock = carbon sequestering energy crop

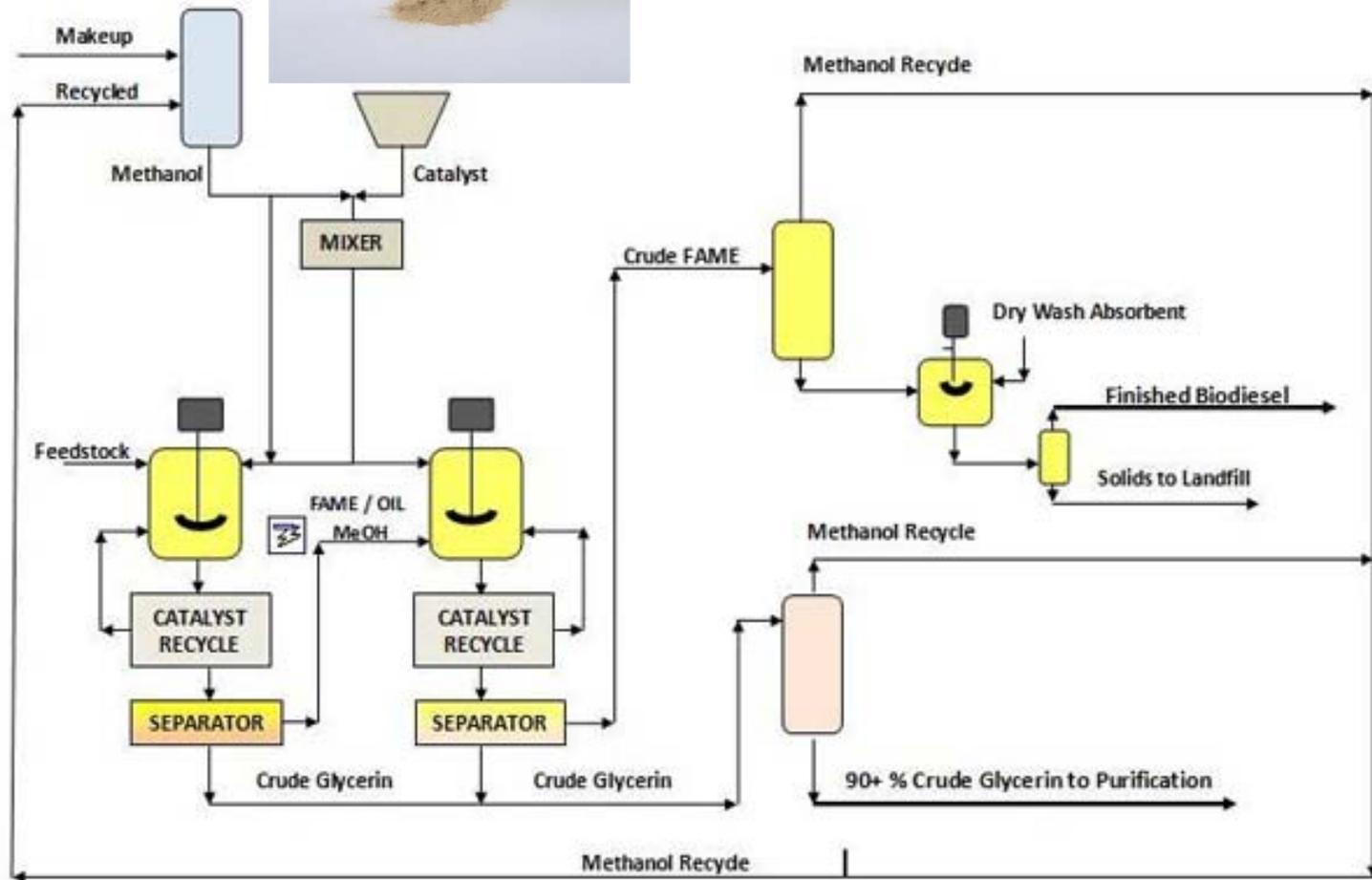
- **Lowest Cost Process**
 - Combines proven technology and naturally occurring organisms
 - Competitive with oil at <\$40 per barrel without subsidy

- **Experienced management team**
 - Koch Petroleum Group, Coors Brewing, Bechtel, and Dow

- **\$40MM raised to date**
 - Strong strategic partners: Valero, Prairie Gold, Greenwood, CH2MHill
 - Begin construction of Pilot/Demo in 2009
 - Product by 2010



Solid state catalysts for biodiesel



■ Better biodiesel

- Increases purity of biodiesel and glycerin
- Allows for multiple feedstocks

■ Decreases production costs

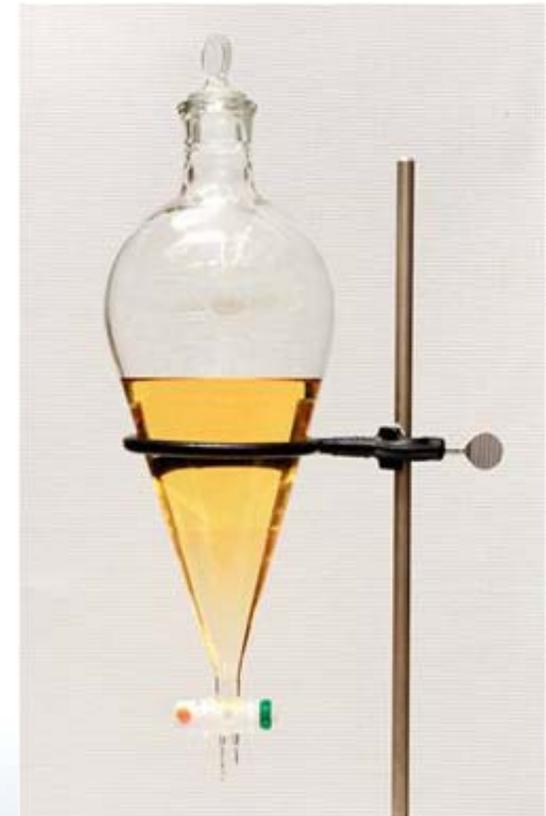
- 15 cent/gallon savings in OPEX
- 40% savings in CAPEX

■ Roadmap for future innovations

- Developed new catalyst for algal oil extraction

■ Pilot plant operational (BECON)

- Moving to continuous design in 2009
- Product Sales 2009-2010



Strategy

... develop and license biomanufacturing processes
 ... enable cost-advantaged sustainable chemicals
 ... from renewable carbohydrates



Renewable Feedstocks

- Sugars
- Cellulosic Biomass
- Glycerol
- Synthesis Gas



Proprietary
Metabolic Engineering



Biomanufacturing
Process Engineering



BDO

OCC(O)CO

\$3B market
demo-plant ready

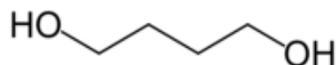
MEK

CC(=O)CC

\$2B market
proven in lab

Other Valuable Intermediates

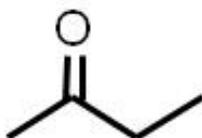
1,4-Butanediol



Better BDO

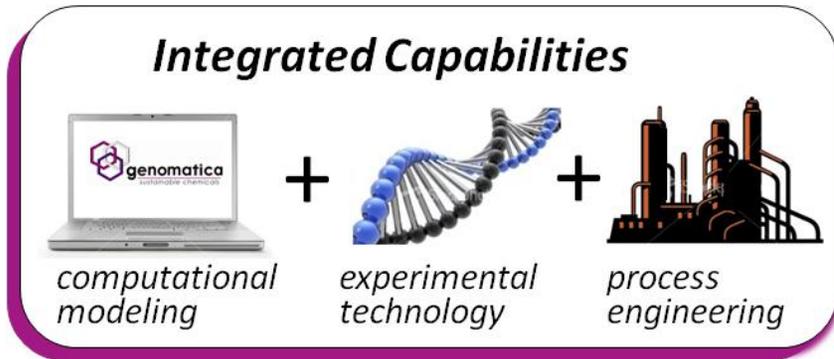
- direct one-step
- first renewable BDO
- 25% less CO₂
- 30% less energy
- lower capital
- cost advantage exceeds 25%
 - \$45-50/bbl Oil
 - \$0.10-0.12/lb Sugar

MEK



Low cost development of MEK

- direct one-step
- first renewable MEK
- reinvigorate existing assets
- No need for pilot/demo
- licensing revenue in 2010



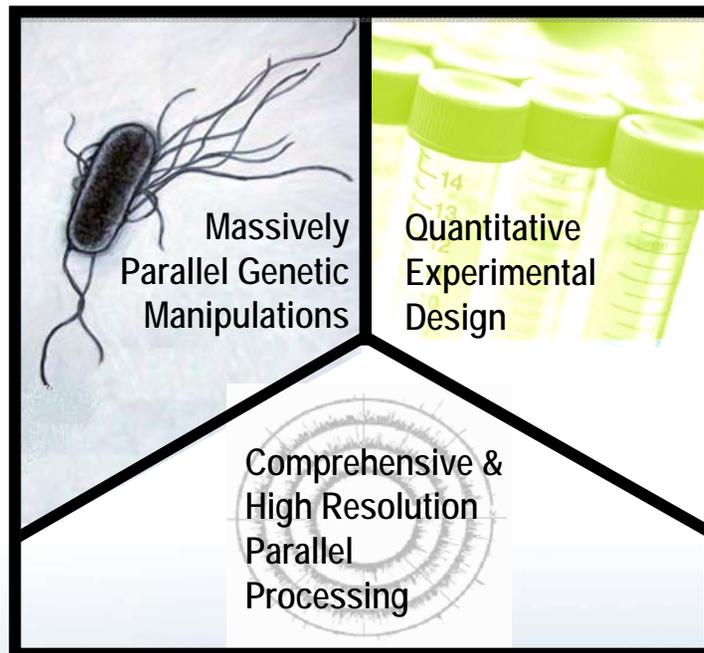
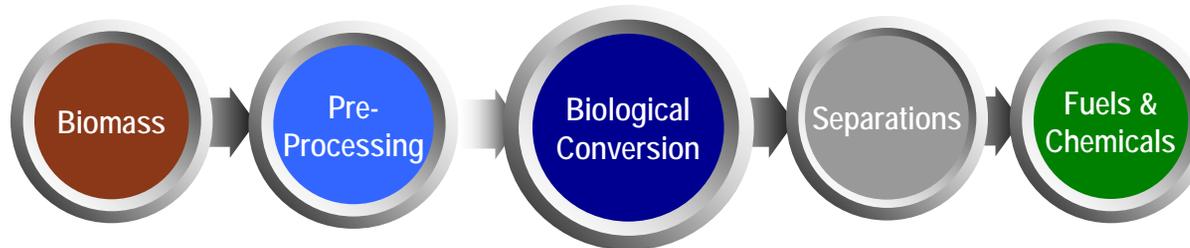
*...design, engineer, and evolve
 ...high producing microorganisms
 ...enabling cost-advantage processes*

18 Month Accomplishments:

1. First bio-BDO produced ever with multiple pathways established
2. Glucose & sucrose feedstocks enabled
3. Organism evolved to tolerate industrial concentrations of BDO
4. Ready for BDO demo and licensing
5. Now adding focus on bioMEK



- Harnessing sustainable feedstocks

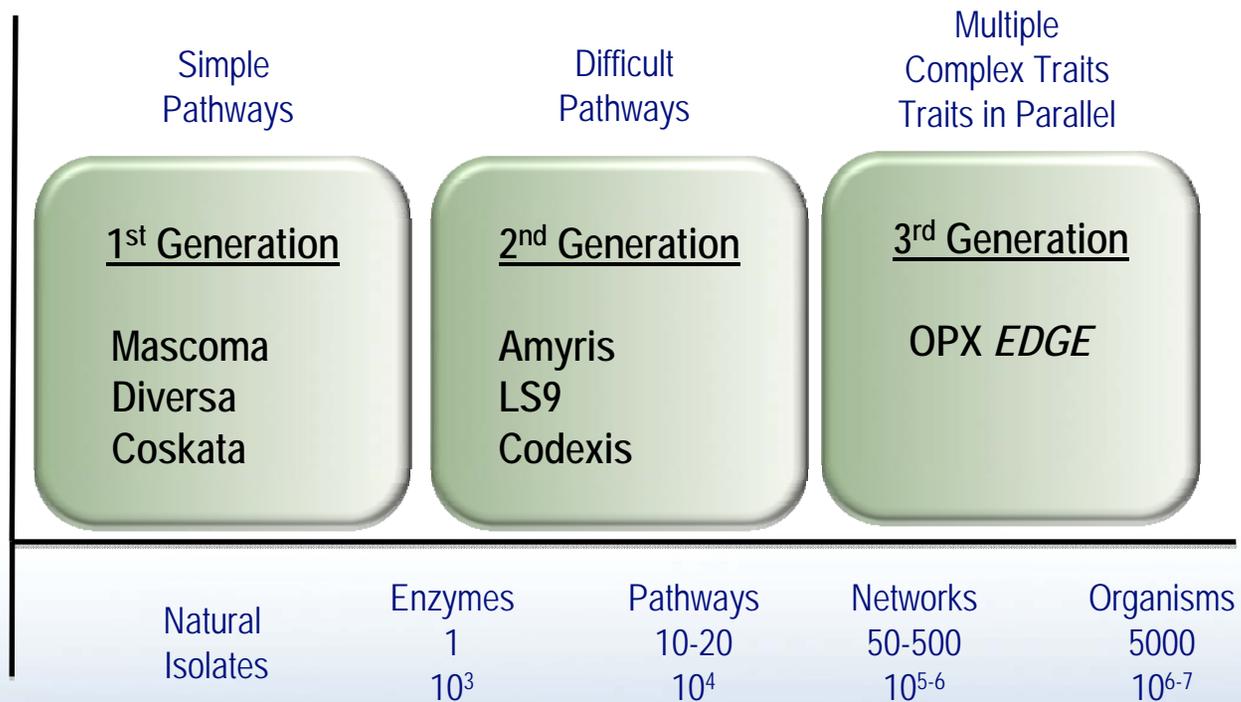


Nextgen microbial engineering platform

- Rapid parallel processing capabilities
- Lowers development time/costs
- Demonstrated accomplishments in 3HP
- Commercializing Acrylic and Diesel

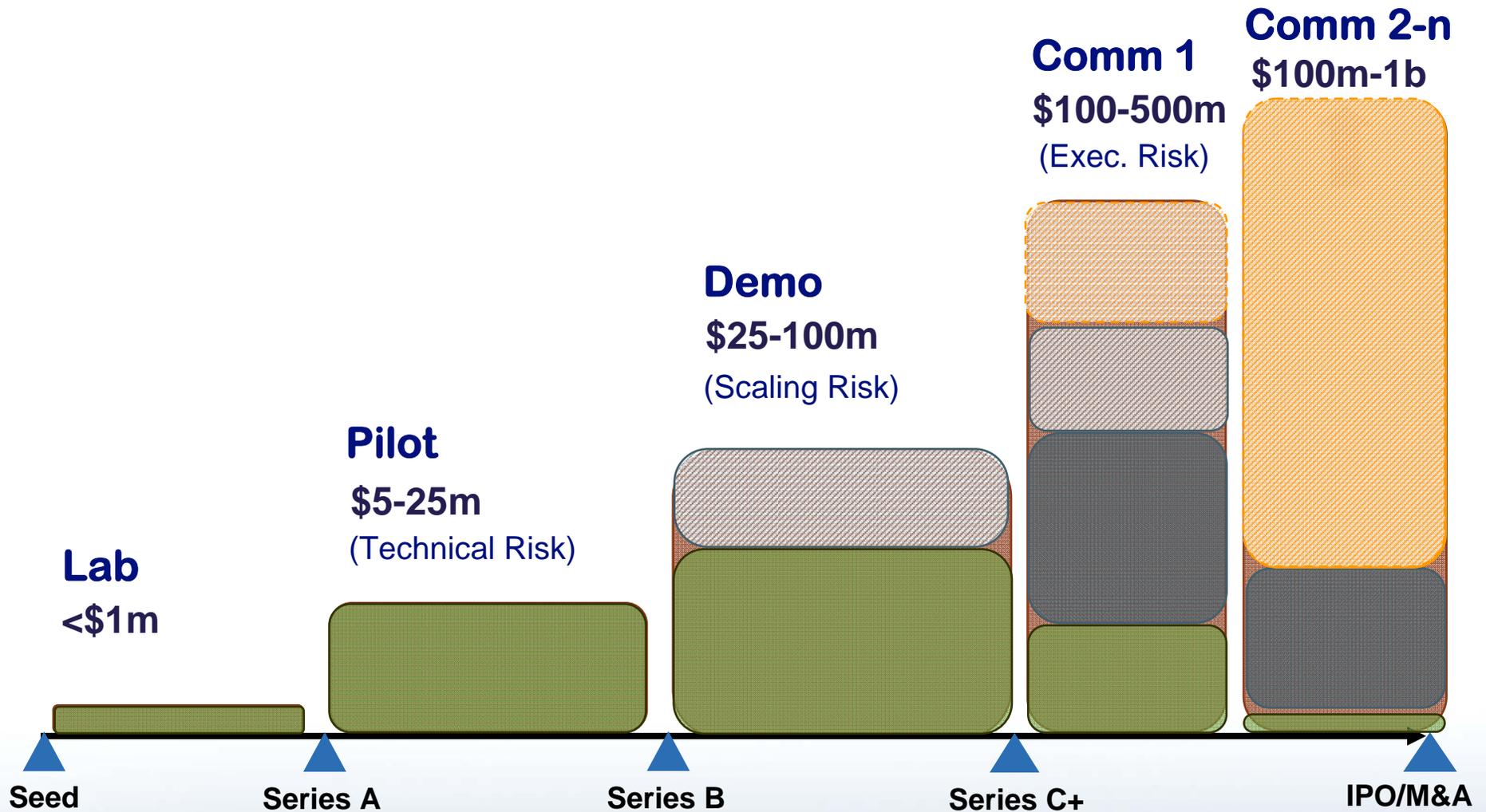
Unlocks low cost bio-products

- Rapidly solve process development and scale-up issues
- Up to 50% lower operating and capital costs
- Ready to build acrylic pilot

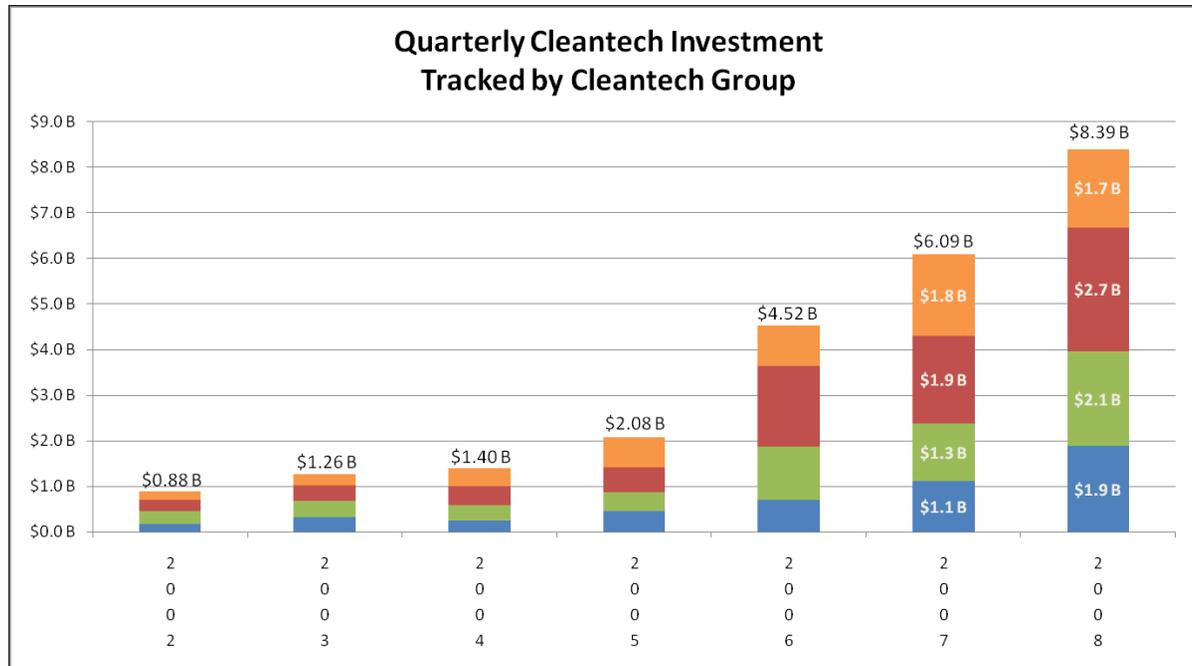


Investing in BioEnergy in today's environment

Chronology of an “average” start-up

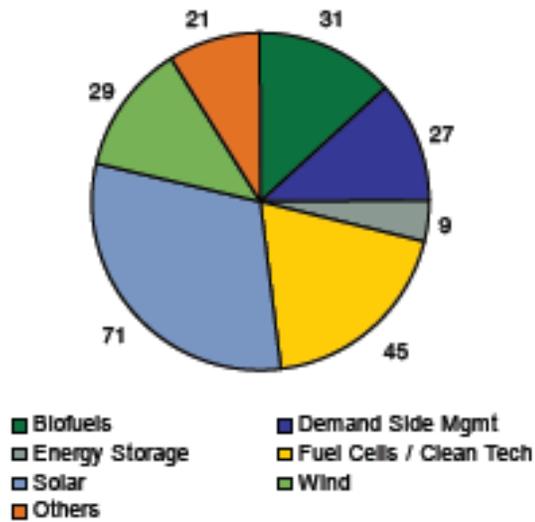


Early stage funding for cleantech still robust

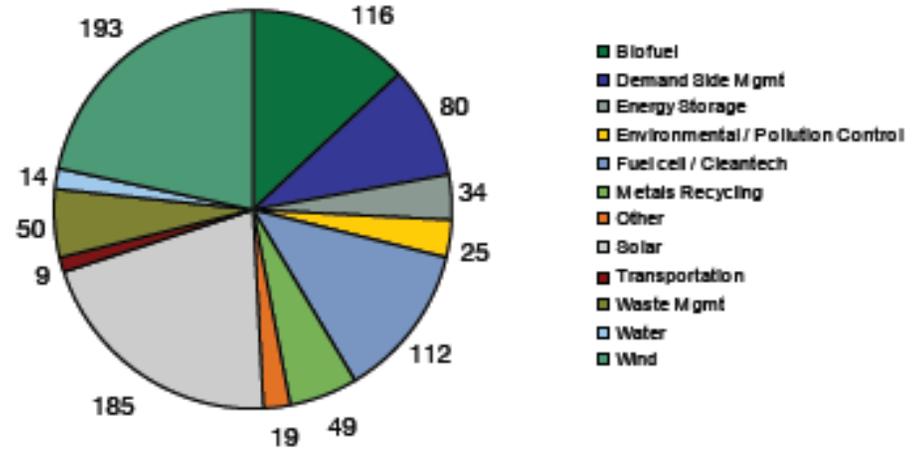


- **2008 up 38%**
- **Steady in Q4 2008**
- **6-year CAGR of 60%**

Issuance



Global Cleantech M&A Activity



Public markets reflect challenges

Stock Price Performance by Sector

Sector	Percent Change ⁽¹⁾				
	December 2008	Last 3 Months	Last 6 Months	Since 1/1/08	Since 1/1/07
Biofuels	13.6%	(58.1%)	(72.2%)	(82.8%)	(87.1%)
Demand Side Management	29.4%	(25.6%)	(39.0%)	(54.5%)	(14.4%)
Downstream Solar	(13.1%)	(50.0%)	(75.0%)	(84.2%)	(89.5%)
Energy Storage	1.7%	(24.7%)	(37.8%)	(27.0%)	(9.3%)
Environmental / Pollution Control	12.6%	(49.4%)	(54.8%)	(60.3%)	(80.4%)
Environmental Services / Waste Management	10.0%	(12.0%)	(24.0%)	(36.6%)	(29.4%)
Fuel Cells / Clean Technologies	3.4%	(25.9%)	(50.9%)	(50.2%)	(29.7%)
Metals Recycling	27.3%	1.5%	(50.5%)	(35.8%)	(22.1%)
Midstream Solar	11.2%	(47.3%)	(58.7%)	(68.4%)	13.1%
Solar Equipment Systems	(12.6%)	(68.9%)	(73.2%)	(74.4%)	(59.5%)
Transportation	5.7%	(39.0%)	(50.6%)	(32.3%)	(28.9%)
Upstream Solar	(7.4%)	(49.3%)	(75.2%)	(81.9%)	(80.9%)
Water	7.0%	(43.3%)	(55.0%)	(57.7%)	(59.8%)
Wind	(1.7%)	(51.0%)	(69.0%)	(70.0%)	(30.6%)
Mean	6.2%	(38.8%)	(56.1%)	(58.3%)	(43.5%)
Median	6.4%	(45.3%)	(54.9%)	(59.0%)	(30.2%)
Nasdaq	2.7%	(24.6%)	(31.2%)	(40.5%)	(34.7%)
S&P 500	0.8%	(22.6%)	(29.4%)	(38.5%)	(36.3%)
Russell 2000	5.6%	(26.5%)	(27.6%)	(34.8%)	(36.6%)
WillderHill Clean Energy	(0.9%)	(42.6%)	(57.6%)	(70.0%)	(52.6%)

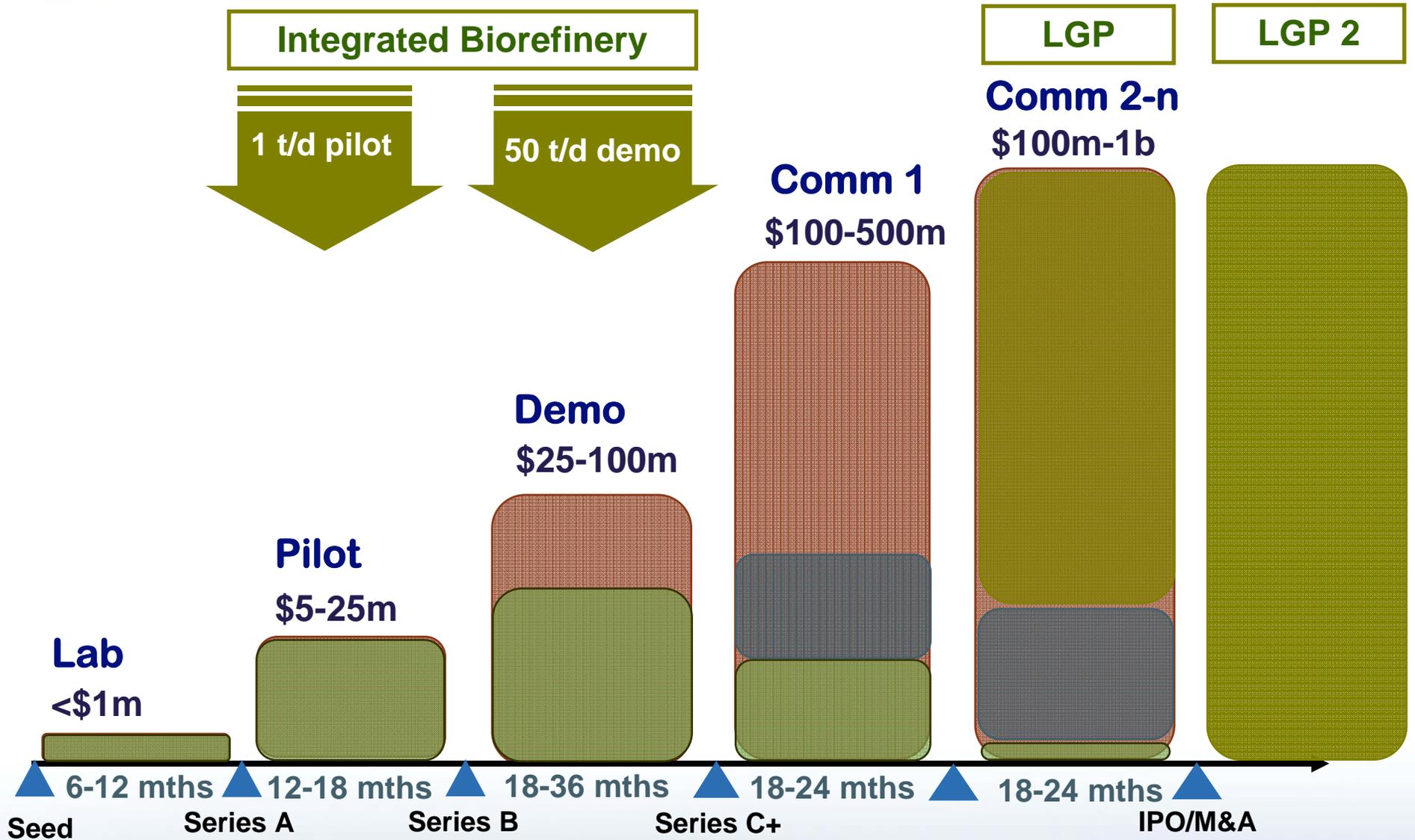
Source: Thomas Weisel 2008

How do we bring back a focus on real value?



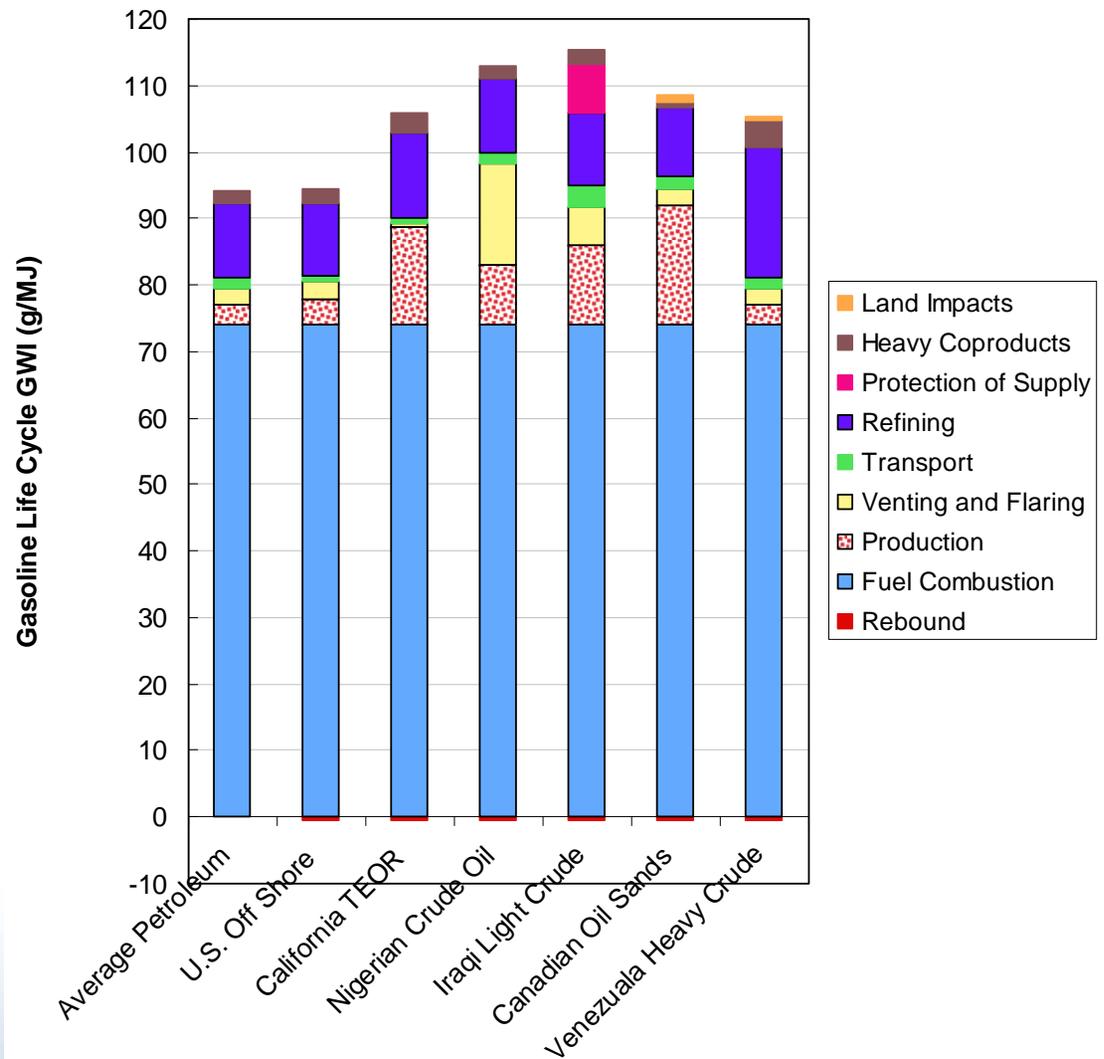
"Stop! Wait! Government's no longer the problem—it's the solution!"

Federal programs focus on financing gap



- CA LCFS currently under development
- Other states will likely replicate
- Significant debate over application of ILUC
- Ramifications not well understood by biofuel players
- Players should engage immediately

“Direct” GHG Emissions



Need policies that catalyze markets

- **Support for innovative technologies**
- **Performance based incentives rather than policies that pick technology winners**
- **Investment in enabling infrastructure, leads to creation of new markets and jobs**

Investors follow long term regulatory certainty

Continued opportunity for bioenergy in 2009

- The need for low carbon non-petroleum solutions still exists
- Government mechanisms are improving
- Knowledge in the field is increasing
- Teams are much more experienced
- Investors are tepid but open to cost/performance advantages
- Long term differentiated advantages are critical
- Capital planning will be key

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